# HEPATITIS C, ACUTE

| CRUDE DATA | |
|---|---|
| Number of Cases | 5 |
| Annual Incidence | |
| LA County | 0.05[a] |
| California[b] | 0.19 |
| United States[b] | 0.69 |
| Age at Diagnosis | |
| Mean | 36 |
| Median | 37 |
| Range | 22–51 years |

[a]Rates calculated based on less than 19 cases or events are considered unreliable.
[b]Calculated from Final 2014 Reports of Nationally Notifiable Infectious Diseases. MMWR 64(36):1019–1033.

## DESCRIPTION

Hepatitis C virus (HCV) is a RNA-virus primarily transmitted through percutaneous exposure to infectious blood. Traditional risk factors include: injection drug use (IDU), receipt of a blood transfusion prior to 1992, needle-stick injuries in healthcare settings, birth to infected mothers, having multiple sexual partners, tattoos or body-piercing and hemodialysis. The presence of HIV infection is associated with increased risk of infection among men engaging in sexual practices with other men. Household or familial contact does not appear to increase the risk of transmission of hepatitis C. An estimated 30% of cases have no identifiable exposure risk. Healthcare related transmission has been documented and should be considered in persons without identified traditional risk factors for hepatitis C. HCV is the most common chronic bloodborne infection in the US.

The average incubation period is 4-12 weeks (range: 2-24 weeks). Up to 85% of persons with newly acquired HCV infection are asymptomatic but when symptoms occur they can include: fever, fatigue, a loss of appetite, nausea, vomiting, abdominal pain, dark urine, clay-colored bowel movements, joint pain, and jaundice. After acute infection, 15%-25% of persons appear to resolve their infection, while chronic infection develops in 75%-85% of persons. Long term medical complications occur decades after initial infection including cirrhosis, liver failure, and hepatic cancer.

Primary prevention activities are recommended for prevention and control of HCV infection includingviral inactivation of plasma-derived products, risk-reduction counseling and screening of persons at risk for HCV infection, and routine practice of injection safety in healthcare settings. Screening and testing of blood donors and persons born during 1945 through 1965 is recommended to identify persons with chronic infection so they can modify their behaviors to decrease progression of disease or receive treatment. There is no vaccine or post-exposure prophylaxis for HCV and vaccines for hepatitis A and B do not provide immunity against hepatitis C.

For the purpose of surveillance, LAC DPH uses the 2012 Centers for Disease Control (CDC)/Council of State and Territorial Epidemiologists (CSTE) criteria for acute hepatitis C: 1) discrete onset of symptoms; 2) jaundice or alanine aminotransferase (ALT) levels >400IU/L; 3) (a) anti-HCV screening test positive with signal to cut-off ratio predictive of true positive or (b) HCV RIBA positive or (c) Nucleic Acid Test (NAT) for HCV RNA positive; and 4) no evidence of either acute hepatitis A or B disease.

In 2012, the CDC/CSTE acute hepatitis C case definition also included documented seroconversion cases as acute hepatitis C cases (documented negative HCV test result within 6 months prior to HCV diagnosis).

## 2014 TRENDS AND HIGHLIGHTS

- In 2014, only 5 cases were reported that met the definition for acute hepatitis C. This is consistent with the previous four years when an average of 6.5 cases was reported. This reflects substantial underreporting of incident cases.
- Of the five reported cases in 2014, two each occurred in the 15-34 and 35-44 year old age groups (Figure 2) and two each were white and Hispanic (Figure 3).
- The male to female ratio was 1:4.
- There were no healthcare associated investigations of Hepatitis C in 2014.
- Risk factors were identified in all of the five confirmed cases (including some having multiple risk factors). Sexual contact with a suspected case (n=3) was the most common risk factor reported followed by exposure to someone's blood (n=2), using injection street drugs (n=2), having multiple sexual partners

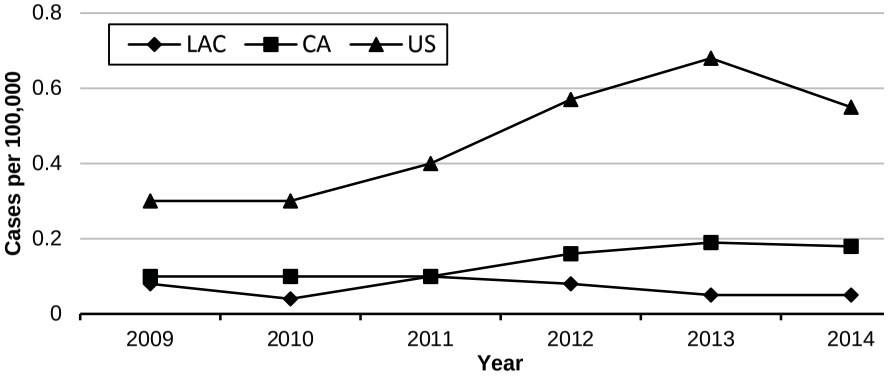
(n=2), and other exposures (n = 1 each) (Figure 4).

## Reported Hepatitis C, Acute Cases and Rates* per 100,000 by Age Group, Race/Ethnicity, and SPA
## Los Angeles County, 2010-2014

| | 2010 (N=4) | | | 2011 (N=10) | | | 2012 (N=7) | | | 2013 (N=5) | | | 2014 (n=5) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 |
| **Age Group** | | | | | | | | | | | | | | | |
| <1 | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | - |
| 1-4 | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | - |
| 5-14 | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | - |
| 15-34 | 1 | 25.0 | - | 4 | 40.0 | 0.1 | 4 | 57.1 | 0.1 | 2 | 40 | 0.1 | 2 | 40 | 0.1 |
| 35-44 | 2 | 50.0 | 0.1 | 2 | 20.0 | 0.1 | 1 | 14.3 | 0.1 | 1 | 20 | 0.1 | 2 | 40 | 0.2 |
| 45-54 | 1 | 25.0 | 0.1 | 1 | 10.0 | 0.1 | 2 | 28.6 | 0.2 | 1 | 20 | 0.1 | 1 | 20 | 0.1 |
| 55-64 | 0 | - | - | 1 | 10.0 | 0.1 | 0 | - | - | 1 | 20 | 0.1 | 0 | - | - |
| 65+ | 0 | - | - | 2 | 20.0 | 0.2 | 0 | - | - | 0 | - | - | 0 | - | - |
| Unknown | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | - |
| **Race/Ethnicity** | | | | | | | | | | | | | | | |
| Asian | 0 | - | - | 1 | 10.0 | 0.1 | 0 | - | - | 0 | - | - | 1 | 20 | 0.1 |
| Black | 0 | - | - | 0 | - | - | 1 | 14.3 | 0.1 | 0 | - | - | 0 | - | - |
| Hispanic | 1 | 25.0 | - | 6 | 60.0 | 0.1 | 3 | 42.9 | 0.1 | 1 | 20 | - | 2 | 40 | - |
| White | 3 | 75.0 | 0.1 | 2 | 20.0 | 0.1 | 2 | 28.6 | 0.1 | 4 | 80 | 0.2 | 2 | 40 | 0.1 |
| Other | 0 | - | - | 0 | - | - | 1 | 14.3 | - | 0 | - | - | 0 | - | - |
| Unknown | 0 | - | - | 1 | 10.0 | 0.1 | 0 | - | - | 0 | - | - | 0 | - | - |
| **SPA** | | | | | | | | | | | | | | | |
| 1 | 0 | - | - | 0 | - | - | 2 | 28.6 | 0.5 | 0 | - | - | 0 | - | - |
| 2 | 3 | 75.0 | 0.1 | 1 | 10.0 | - | 1 | 14.3 | 0.0 | 1 | 20 | - | 3 | 60 | 0.1 |
| 3 | 0 | - | - | 2 | 20.0 | 0.1 | 0 | - | - | 1 | 20 | 0.1 | 2 | 40 | 0.1 |
| 4 | 0 | - | - | 3 | 30.0 | 0.2 | 1 | 14.3 | 0.1 | 0 | - | - | 0 | - | - |
| 5 | 0 | - | - | 1 | 10.0 | 0.2 | 1 | 14.3 | 0.2 | 1 | 20 | 0.2 | 0 | - | - |
| 6 | 0 | - | - | 0 | - | - | 1 | 14.3 | 0.1 | 0 | - | - | 0 | - | - |
| 7 | 0 | - | - | 2 | 20.0 | 0.1 | 0 | - | - | 1 | 20 | 0.1 | 0 | - | - |
| 8 | 1 | 25.0 | 0.1 | 1 | 10.0 | 0.1 | 1 | 14.3 | 0.1 | 1 | 20 | 0.1 | 0 | - | - |
| Unknown | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | - |

*Rates calculated based on less than 19 cases or events are considered unreliable.

**Figure 1. Incidence Rates* of Acute Hepatitis C**
**LAC, CA and USA , 2009-2014**




*Rates based on fewer than 19 cases are unreliable

**Figure 2. Cases of Acute Hepatitis C by Age Group**
**LAC, 2012-2014**

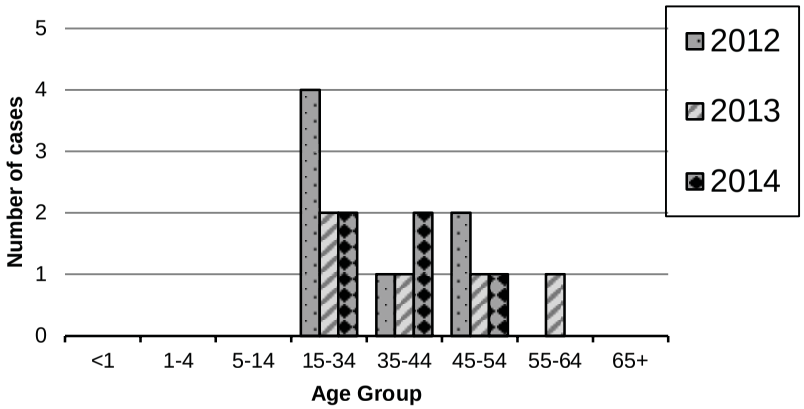



**Figure 3. Percent Cases of Acute Hepatitis C by Race/Ethnicity**
**LAC, 2014 (N=5)**

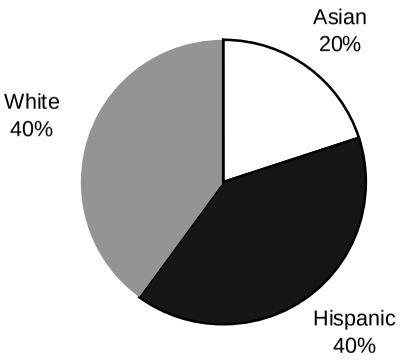
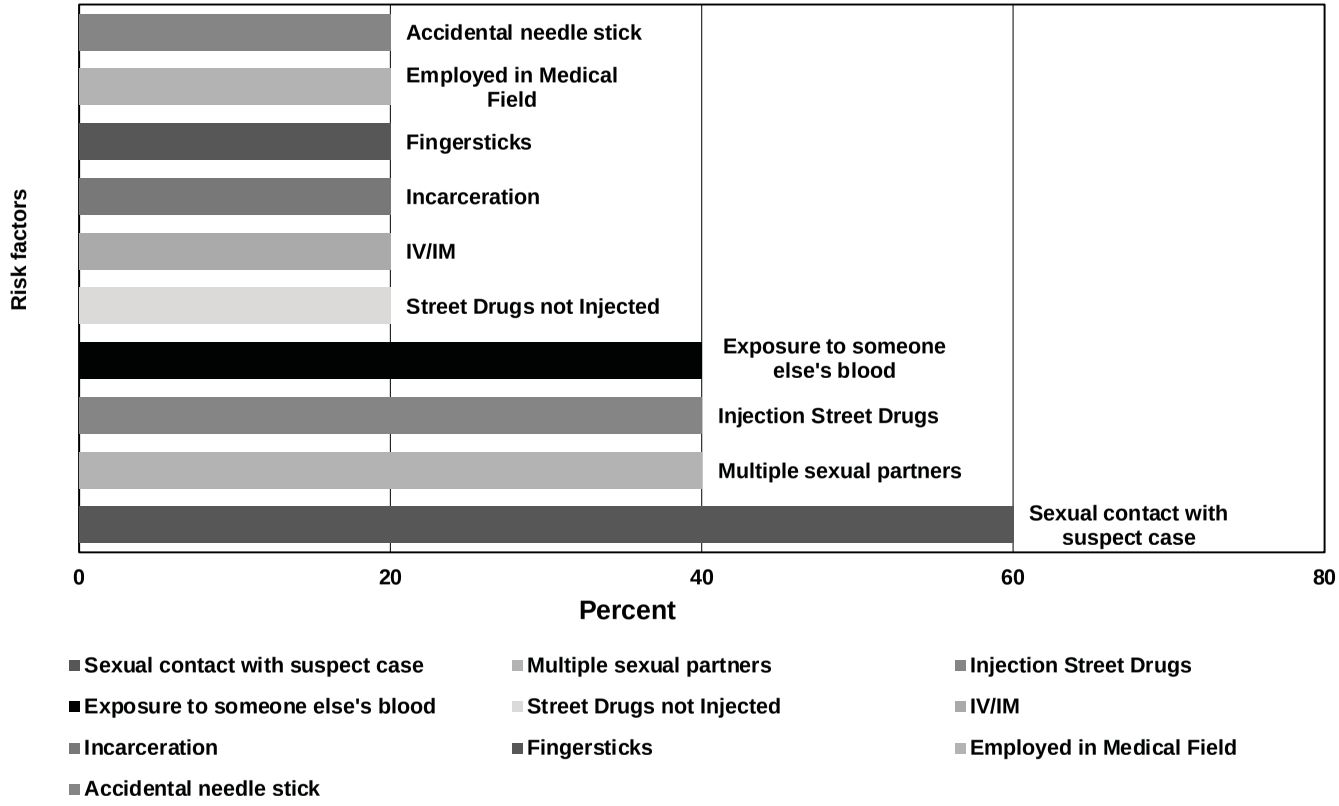


**Figure 4. Hepatitis C Reported Risk Factors***
**LAC, 2014 (N=5)**



# HEPATITIS C, ACUTE

| CRUDE DATA | |
|---|---|
| Number of Cases | 5 |
| Annual Incidence | |
| LA County | 0.05[a] |
| California[b] | 0.19 |
| United States[b] | 0.68 |
| Age at Diagnosis | |
| Mean | 38 |
| Median | 40 |
| Range | 22-56 years |

[a]Rates calculated based on less than 19 cases or events are considered unreliable.
[b]Calculated from Final 2013 Reports of Nationally Notifiable Infectious Diseases. MMWR 63(32):702-716.

## DESCRIPTION

The Hepatitis C virus (HCV) is a RNA-virus primarily transmitted though percutaneous exposure to infectious blood. Traditional risk factors include: injection drug use (IDU), receipt of a blood transfusion prior to 1992, needle-stick injuries in healthcare settings, birth to infected mothers, having multiple sexual partners, tattoos or body-piercing and hemodialysis. The presence of HIV infection is associated with increased risk of infection among men engaging in sexual practices with other men. Household or familial contact does not appear to increase the risk of transmission of hepatitis C. An estimated 30% of cases have no identifiable exposure risk. Healthcare related transmission has been documented and should be considered in persons without identified traditional risk factors for hepatitis C. HCV is the most common chronic bloodborne infection in the US.

The average incubation period is 4-12 weeks (range: 2-24 weeks). Up to 85% of persons with newly acquired HCV infection are asymptomatic but when symptoms occur they can include: fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, clay-colored bowel movements, joint pain, and jaundice. After acute infection, 15%-25% of persons appear to resolve their infection, while chronic infection develops in 75%-85% of persons. Most studies have reported that medical complications occur decades after initial infection including cirrhosis, liver failure, and hepatic cancer.

Primary prevention activities are recommended for prevention and control of HCV infection including; screening and testing of blood donors and persons born during 1945 through 1965, viral inactivation of plasma-derived products, risk-reduction counseling and screening of persons at risk for HCV infection, and routine practice of injection safety in healthcare settings. There is no vaccine or post-exposure prophylaxis for HCV and vaccines for hepatitis A and B do not provide immunity against hepatitis C.

For the purpose of surveillance, Los Angeles County Department of Public Health uses the 2012 Centers for Disease Control (CDC)/Council of State and Territorial Epidemiologists (CSTE) criteria for acute hepatitis C: 1) discrete onset of symptoms and 2) jaundice or alanine aminotransferase (ALT) levels > 400IU/L, and 3) (a) anti-HCV screening test positive with signal to cut-off ratio predictive of true positive or (b) HCV RIBA positive or (c) Nucleic Acid Test (NAT) for HCV RNA positive 4) no evidence of either acute hepatitis A or B disease.

In 2012, the CDC/CSTE acute hepatitis C case definition also included documented seroconversion cases as acute hepatitis C cases (documented negative HCV test result within 6 months prior to HCV diagnosis).

## 2013 TRENDS AND HIGHLIGHTS

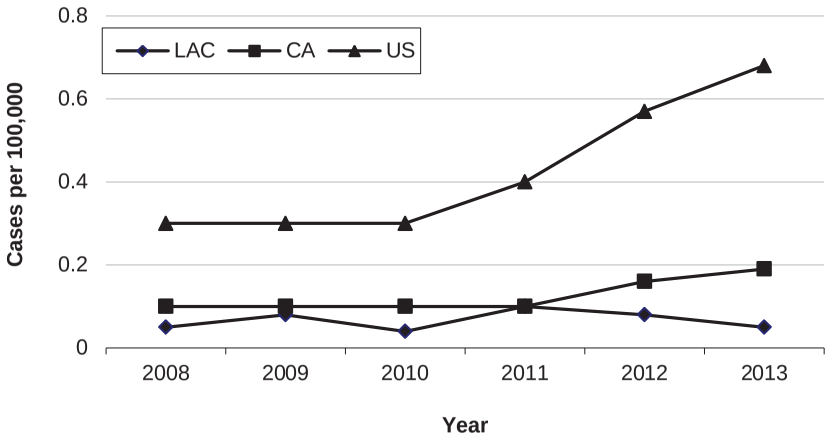
- As in previous years, the majority of cases in 2013 were in the 15-34 year age group (n=2, 40%) (Figure 2).
- The majority of cases in 2013 were white (n=4, 80%), there were no Asian or Black cases (Figure 3).
- The male to female ratio was 1:1.5.
- Risk factors were identified in 100% (n=5) of the confirmed cases interviewed (including having multiple risk factors). Exposure to someone's blood (n=4, 80%), was the most common risk factor reported, followed by using non-injection street drugs (n=2, 40%), IDU (n=2, 40%), incarceration (n=2 [jail], 40%), IV/IM injection (n=2, 40%), sexual contact with a suspected case (n=1, 20%), accidental needle stick (n=1, 20%), having multiple sexual partners (n=1, 20%), body piercing (n=1, 20%), acupuncture (n=1, 20%), and dental procedure (n=1, 20%) (Figure 4).

## Reported Hepatitis C, Acute Cases and Rates* per 100,000 by Age Group, Race/Ethnicity, and SPA
## Los Angeles County, 2009-2013

| | 2009(N=8) | | | 2010 (N=4) | | | 2011 (N=10) | | | 2012 (N=7) | | | 2013 (N=5) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 |
| **Age Group** | | | | | | | | | | | | | | | |
| <1 | 0 | 0.0 | 0 | 0 | 0.0 | 0 | 0 | 0.0 | | 0 | 0 | | 0 | 0 | 0 |
| 1-4 | 0 | 0.0 | 0 | 0 | 0.0 | 0 | 0 | 0.0 | | 0 | 0 | | 0 | 0 | 0 |
| 5-14 | 0 | 0.0 | 0 | 0 | 0.0 | 0 | 0 | 0.0 | | 0 | 0 | | 0 | 0 | 0 |
| 15-34 | 1 | 12.5 | 0.0 | 1 | 25.0 | 0 | 4 | 40.0 | 0.1 | 4 | 57.1 | 0.1 | 2 | 40 | 0.1 |
| 35-44 | 2 | 25.0 | 0.1 | 2 | 50.0 | 0.1 | 2 | 20.0 | 0.1 | 1 | 14.3 | 0.1 | 1 | 20 | 0.1 |
| 45-54 | 3 | 37.5 | 0.2 | 1 | 25.0 | 0.1 | 1 | 10.0 | 0.1 | 2 | 28.6 | 0.2 | 1 | 20 | 0.1 |
| 55-64 | 1 | 12.5 | 0.1 | 0 | 0.0 | 0 | 1 | 10.0 | 0.1 | 0 | 0 | | 1 | 20 | 0.1 |
| 65+ | 1 | 12.5 | 0.1 | 0 | 0.0 | 0 | 2 | 20.0 | 0.2 | 0 | 0 | | 0 | 0 | 0 |
| Unknown | 0 | 0.0 | | 0 | 0.0 | | 0 | | | 0 | | | 0 | 0 | |
| **Race/Ethnicity** | | | | | | | | | | | | | | | |
| Asian | 1 | 12.5 | 0.1 | 0 | 0 | 0 | 1 | 10.0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Black | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 1 | 14.3 | 0.1 | 0 | 0 | 0 |
| Hispanic | 1 | 12.5 | 0 | 1 | 25.0 | 0 | 6 | 60.0 | 0.1 | 3 | 42.9 | 0.1 | 1 | 20 | 0 |
| White | 6 | 75 | 0.2 | 3 | 75.0 | 0.1 | 2 | 20.0 | 0.1 | 2 | 28.6 | 0.1 | 4 | 80 | 0.2 |
| Other | 0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 1 | 14.3 | | 0 | 0 | 0 |
| Unknown | 0 | | | 0 | | | 1 | 10.0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| **SPA** | | | | | | | | | | | | | | | |
| 1 | 1 | 12.5 | 0.3 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 2 | 28.6 | 0.5 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | 3 | 75.0 | 0.1 | 1 | 10.0 | 0.0 | 1 | 14.3 | 0.0 | 1 | 20 | 0 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 20.0 | 0.1 | 0 | 0 | 0 | 1 | 20 | 0.1 |
| 4 | 2 | 25.0 | 0.2 | 0 | 0 | 0 | 3 | 30.0 | 0.2 | 1 | 14.3 | 0.1 | 0 | 0 | 0 |
| 5 | 2 | 25.0 | 0.3 | 0 | 0 | 0 | 1 | 10.0 | 0.2 | 1 | 14.3 | 0.2 | 1 | 20 | 0.2 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 1 | 14.3 | 0.1 | 0 | 0 | 0 |
| 7 | 1 | 12.5 | 0.1 | 0 | 0 | 0 | 2 | 20.0 | 0.1 | 0 | 0 | 0 | 1 | 20 | 0.1 |
| 8 | 2 | 25.0 | 0.2 | 1 | 25.0 | 0.1 | 1 | 10.0 | 0.1 | 1 | 14.3 | 0.1 | 1 | 20 | 0.1 |
| Unknown | 0 | | | 0 | | | | | | 0 | 0 | | | | |

*Rates calculated based on less than 19 cases or events are considered unreliable.

**Figure 1. Incidence Rates* of Acute Hepatitis C
LAC, CA and US, 2009-2013**




*Rates based on fewer than 19 cases are unreliable

**Figure 2. Cases of Acute Hepatitis C by Age Group
LAC, 2011-2013**

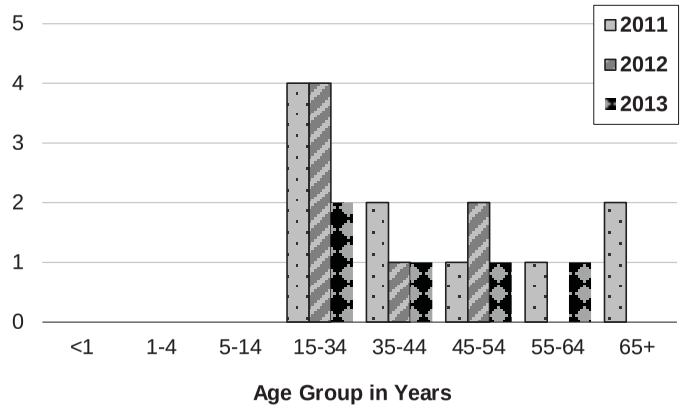



**Figure 3. Percent Cases of Acute Hepatitis C by Race/Ethnicity
LAC, 2013 (N=5)**

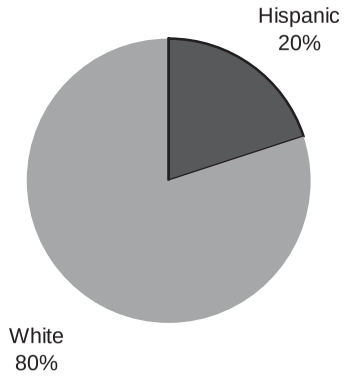
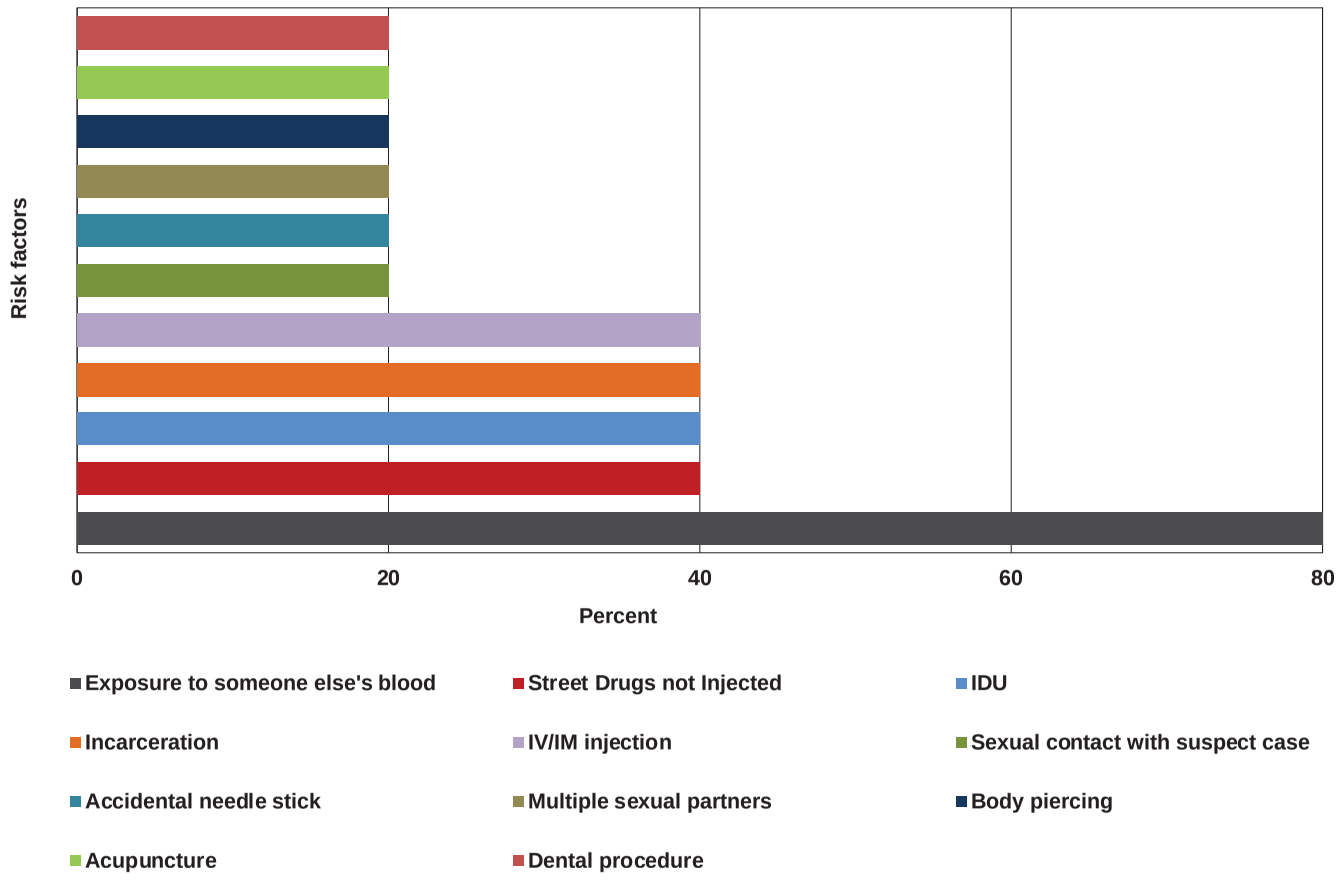


**Figure 4. Hepatitis C Reported Risk Factors***
**LAC, 2013 (N=5)**



# HEPATITIS C, ACUTE

| CRUDE DATA | |
|---|---|
| Number of Cases | 7 |
| Annual Incidence | |
| LA County | 0.08[a] |
| California[b] | 0.16 |
| United States[b] | 0.57 |
| Age at Diagnosis | |
| Mean | 35 |
| Median | 30 |
| Range | 20-52 years |

[a]Rates calculated based on less than 19 cases or events are considered unreliable.
[b]Calculated from Final 2012 Reports of Nationally NotifiableInfectious Disease. MMWR 62(33);669-682.

## DESCRIPTION

The Hepatitis C virus (HCV) is a RNA-virus primarily transmitted though percutaneous exposure to infectious blood. Traditional risk factors include: injection drug use (IDU), receipt of a blood transfusion prior to 1992, needle-stick injuries in healthcare settings, birth to infected mothers, having multiple sexual partners, tattoos or body-piercing and hemodialysis. The presence of HIV infection is associated with increased risk of infection among men engaging in certain sexual practices with other men. Household or familial contact does not appear to increase the risk of transmission of hepatitis C. An estimated 30% of cases have no identifiable exposure risk. Healthcare related transmission has been documented and should be considered in persons without identified traditional risk factors for hepatitis C. HCV is the most common chronic bloodborne infection in the US.

The average incubation period is 4-12 weeks (range: 2-24 weeks). Up to 85% of persons with newly acquired HCV infection are asymptomatic but when symptoms occur they can include: fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, clay-colored bowel movements, joint pain, and jaundice. After acute infection, 15%-25% of persons appear to resolve their infection, while chronic infection develops in 75%-85% of persons. Most studies have reported that medical complications occur decades after initial infection including cirrhosis, liver failure, and hepatic cancer.

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In 2012, the CDC/CSTE acute hepatitis C case definition also included documented seroconversion cases as acute hepatitis C cases (documented negative HCV test result within 6 months prior to HCV diagnosis).

## 2012 TRENDS AND HIGHLIGHTS

- Of the seven confirmed acute hepatitis C cases for 2012, two cases were documented seroconversions and the remainder of the cases met the 2012 CDC/CSTE acute hepatitis C case criteria.
- The majority of cases were in the 15-34 year age group (n=4, 57%) (Figure 2).
- The majority of cases were Hispanic (n=3, 43%), there were no Asian cases (Figure 3).
- The male to female ratio was 1:0.4.
- Risk factors were identified in 100% (n=7) of the confirmed cases interviewed. Receiving a tattoo (n=3 [2 in prison, 1 in home], 43%), IDU (n=3, 43%) and incarceration (n=3, 43%) were the most common risk factors reported, followed by using street drugs but not injecting (n=2, 29%), exposure to someone's blood (n=2, 29%), contact with a suspected case (n=2, 29%), receiving a diagnostic medical procedure (n=2, 29%), IV/IM injection (n=2,

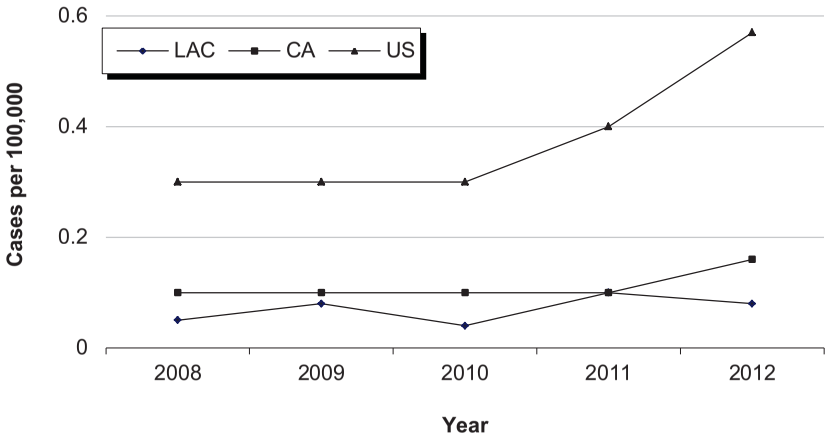
29%), and transfusion (n=2, 29%); and one case each was identified with an accidental needle stick (n=1, 14%), body piercing (n=1, 14%), and having multiple sexual partners (n=1, 14%)
(Figure 4).

## Reported Hepatitis C, Acute Cases and Rates* per 100,000 by Age Group, Race/Ethnicity, and SPA
## Los Angeles County, 2008-2012

| | 2008 (N=5) | | | 2009 (N=8) | | | 2010 (N=4) | | | 2011 (N=10) | | | 2012 (N=7) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 |
| **Age Group** | | | | | | | | | | | | | | | |
| <1 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0 | |
| 1-4 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0 | |
| 5-14 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0 | |
| 15-34 | 1 | 20.0 | | 1 | 12.5 | | 1 | 25.0 | | 4 | 40.0 | 0.1 | 4 | 57.1 | 0.1 |
| 35-44 | 1 | 20.0 | | 2 | 25.0 | | 2 | 50.0 | | 2 | 20.0 | 0.1 | 1 | 14.3 | 0.1 |
| 45-54 | 2 | 40.0 | | 3 | 37.5 | | 1 | 25.0 | | 1 | 10.0 | 0.1 | 2 | 28.6 | 0.2 |
| 55-64 | 0 | 0.0 | | 1 | 12.5 | | 0 | 0.0 | | 1 | 10.0 | 0.1 | 0 | 0 | |
| 65+ | 1 | 20.0 | | 1 | 12.5 | | 0 | 0.0 | | 2 | 20.0 | 0.2 | 0 | 0 | |
| Unknown | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | | | | 0 | 0 | |
| **Race/Ethnicity** | | | | | | | | | | | | | | | |
| Asian | 1 | 20.0 | | 1 | 12.5 | | 0 | 0.0 | | 1 | 10.0 | 0.1 | 0 | 0 | 0 |
| Black | 0 | 0.0 | | 0 | 0 | | 0 | 0.0 | | 0 | 0.0 | 0.0 | 1 | 14.3 | 0.1 |
| Hispanic | 1 | 20.0 | | 1 | 12.5 | | 1 | 25.0 | | 6 | 60.0 | 0.1 | 3 | 42.9 | 0.1 |
| White | 3 | 60.0 | | 6 | 75.0 | | 3 | 75.0 | | 2 | 20.0 | 0.1 | 2 | 28.6 | 0.1 |
| Other | 0 | 0.0 | | 0 | 0 | | 0 | 0.0 | | 0 | 0.0 | 0.0 | 1 | 14.3 | |
| Unknown | 0 | | | 0 | | | 0 | 0.0 | | 1 | 10.0 | | 0 | 0 | 0 |
| **SPA** | | | | | | | | | | | | | | | |
| 1 | | 0.0 | | 1 | 12.5 | | 0 | 0.0 | | 0 | 0.0 | 0.0 | 2 | 28.6 | 0.5 |
| 2 | 3 | 60.0 | | 0 | 0.0 | | 3 | 75.0 | | 1 | 10.0 | 0.0 | 1 | 14.3 | 0.0 |
| 3 | 1 | 20.0 | | 0 | 0.0 | | 0 | 0.0 | | 2 | 20.0 | 0.1 | 0 | 0 | 0 |
| 4 | 0 | 0.0 | | 2 | 25.0 | | 0 | 0.0 | | 3 | 30.0 | 0.2 | 1 | 14.3 | 0.1 |
| 5 | 0 | 0.0 | | 2 | 25.0 | | 0 | 0.0 | | 1 | 10.0 | 0.2 | 1 | 14.3 | 0.2 |
| 6 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | 0.0 | 1 | 14.3 | 0.1 |
| 7 | 0 | 0.0 | | 1 | 12.5 | | 0 | 0.0 | | 2 | 20.0 | 0.1 | 0 | 0 | 0 |
| 8 | 1 | 20.0 | | 2 | 25.0 | | 1 | 25.0 | | 1 | 10.0 | 0.1 | 1 | 14.3 | 0.1 |
| Unknown | 0 | 0.0 | | 0 | 0.0 | | | | | 0 | 0.0 | 0.0 | 0 | 0 | |

*Rates calculated based on less than 19 cases or events are considered unreliable.

**Figure 1. Incidence Rates* of Acute Hepatitis C LAC, CA and US, 2008-2012**




*Rates based on fewer than 19 cases are unreliable

**Figure 2. Cases of Acute Hepatitis C by Age Group LAC, 2010-2012**

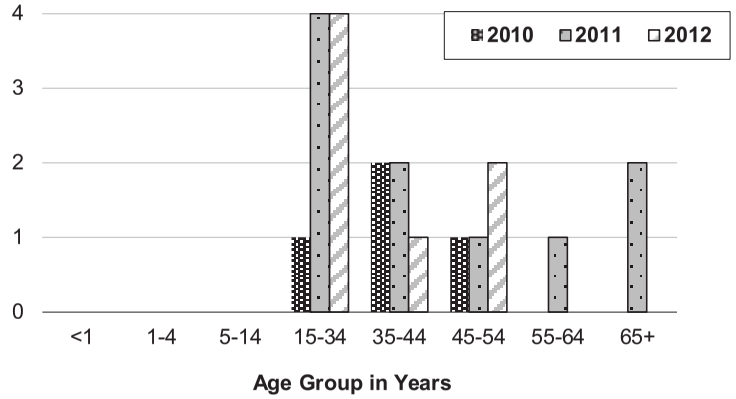
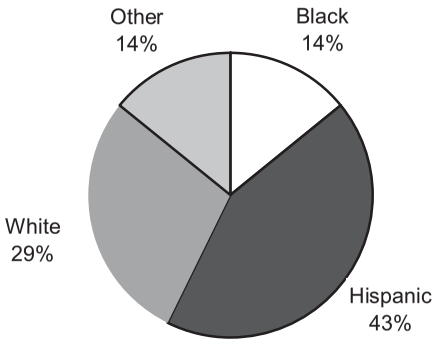



**Figure 3. Percent Cases of Acute Hepatitis C by Race/Ethnicity LAC, 2012 (N=7)**



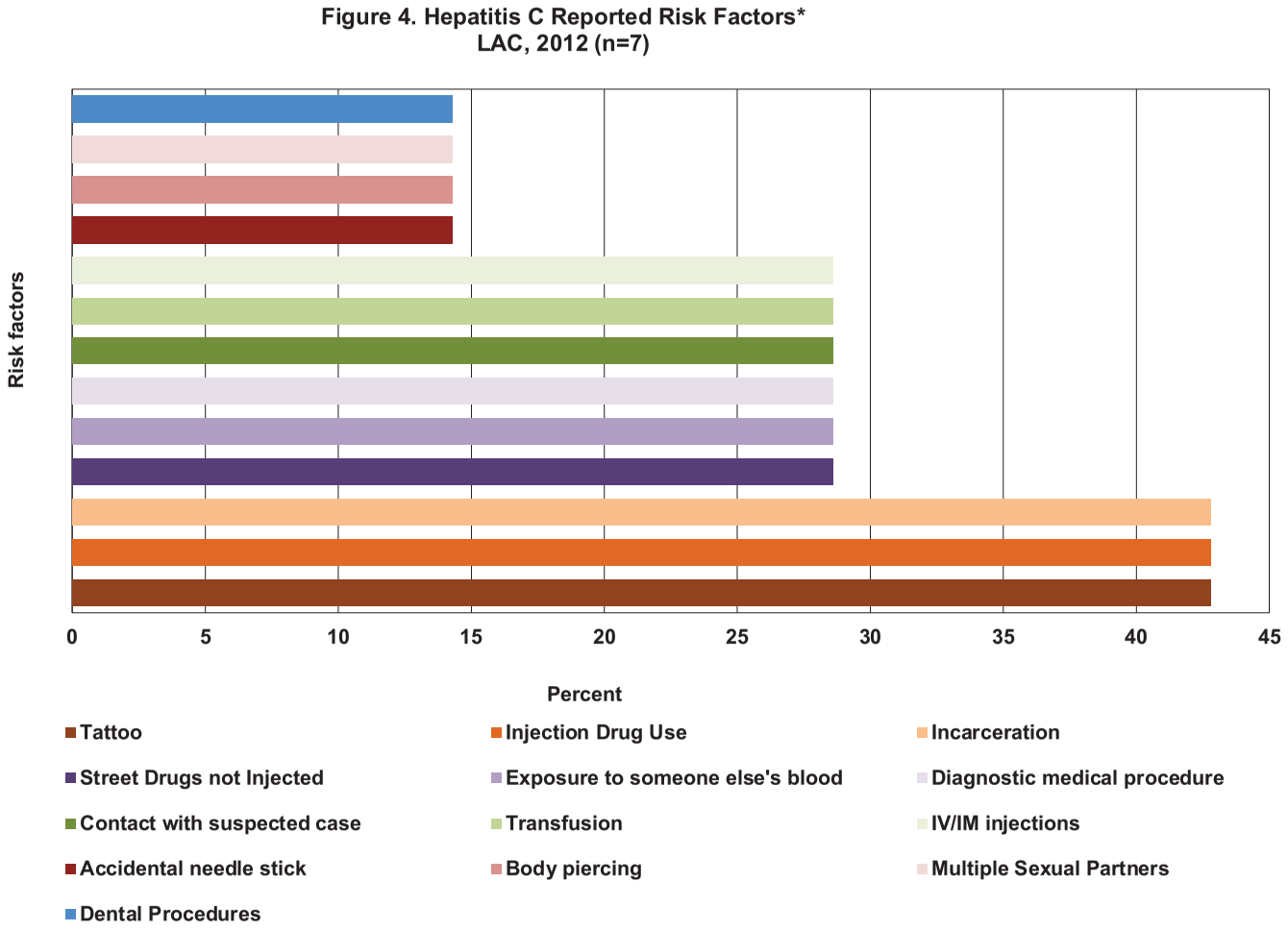


Figure 4. Hepatitis C Reported Risk Factors*
LAC, 2012 (n=7)
Risk factors
0
5
10
15
20
25
30
35
40
45
Percent
Tattoo
Injection Drug Use
Incarceration
Street Drugs not Injected
Exposure to someone else's blood
Diagnostic medical procedure
Contact with suspected case
Transfusion
IV/IM injections
Accidental needle stick
Body piercing
Multiple Sexual Partners
Dental Procedures

# HEPATITIS C, ACUTE

| CRUDE DATA | |
|---|---|
| Number of Cases | 10 |
| Annual Incidence | |
| LA County | 0.10[a] |
| California[b] | 0.13 |
| United States[b] | 0.40 |
| Age at Diagnosis | |
| Mean | 43 |
| Median | 36 |
| Range | 21-75 years |

[a]Rates calculated based on less than 19 cases or events are considered unreliable.
[b]Calculated from Final 2011 Reports of Nationally Notifiable Infectious Disease. MMWR 61(32);625-637.

## DESCRIPTION

The Hepatitis C virus (HCV) is a RNA-virus primarily transmitted though percutaneous exposure to infectious blood. Traditional risk factors include: injection drug use (IDU), receipt of a blood transfusion prior to 1992, needle-stick injuries in healthcare settings, birth to infected mothers, having multiple sexual partners, tattoos or body-piercing and hemodialysis. The presence of HIV infection is associated with increased risk of infection among men engaging in certain sexual practices with other men. Household or familial contact does not appear to increase the risk of transmission of hepatitis C. An estimated 30% of cases have no identifiable exposure risk. Health-care related transmission has been documented and should be considered in persons without identified traditional risk factors for hepatitis C. HCV is the most common chronic bloodborne infection in the US.

The average incubation period is 4-12 weeks (range: 2-24 weeks). Up to 85% of persons with newly acquired HCV infection are asymptomatic but when symptoms occur they can include: fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, clay-colored bowel movements, joint pain, and jaundice. After acute infection, 15%-25% of persons appear to resolve their infection, while chronic infection develops in 75%-85% of persons. Most studies have reported that medical complications occur decades after initial infection including cirrhosis, liver failure, and hepatic cancer.

Primary prevention activities are recommended for prevention and control of HCV infection including; screening and testing of blood donors, viral inactivation of plasma-derived products, risk-reduction counseling and screening of persons at risk for HCV infection, and routine practice of injection safety in health-care settings. There is no vaccine or post-exposure prophylaxis for HCV and vaccines for hepatitis A and B do not provide immunity against hepatitis C.

For the purpose of surveillance, ACDC uses the CDC/CSTE case definition for acute hepatitis C: discrete onset of symptoms and: 1) a positive HCV test (antibody test by EIA) confirmed by a more specific test (RIBA or detection of the HCV-RNA antigen by polymerase-chain reaction [PCR]) or an EIA signal to cutoff ratio of ≥3.8; 2) serum ALT greater than 400; and 3) no evidence of either acute hepatitis A or B disease. In 2011, the CDC/CSTE acute hepatitis C case definition also included documented seroconversion cases as acute hepatitis C cases (documented negative HCV test result within 6 months prior to HCV diagnosis).

## 2011 TRENDS AND HIGHLIGHTS

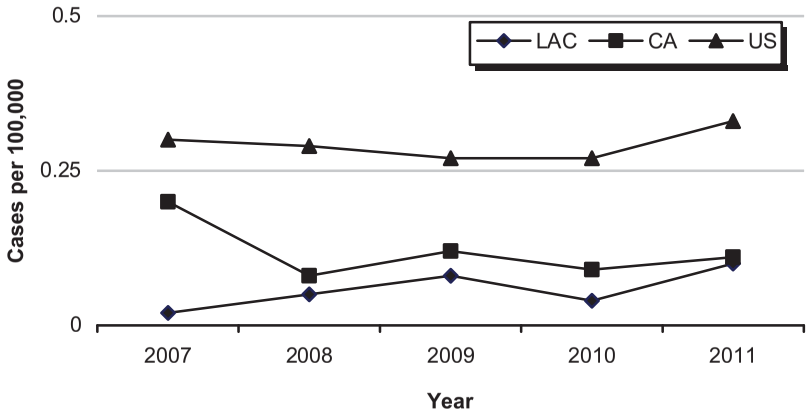
- Of the ten confirmed acute hepatitis C cases for 2011, six cases met the clinical case criteria for acute hepatitis C and four cases were documented seroconversions.
- The majority of cases were Hispanic (n=6, 60%), there were no black cases (Figure 3).
- The male to female ratio was 1:0.67.
- Risk factors were identified in 100% (n=8) of the confirmed cases interviewed (including some cases with multiple risk factors). Having any outpatient medical procedure or surgery was the most common risk factor reported (n=4, 50%), followed by injection of street drugs (n=3, 37.5%), having contact with a suspect or confirmed case (n=2, 25%), hemodialysis (n=2, 25%), exposure to someone else's blood (n=2, 25%), incarceration (n=2, 25%), resident of long term care facility (n=1, 12.5%), receiving fingersticks (n=1, 12.5%), having an accidental needle stick (n=1, 12.5%), receiving a transfusion (n=1, 12.5%), having multiple sexual partners (n=1, 25%).

## Reported Hepatitis C, Acute Cases and Rates* per 100,000 by Age Group, Race/Ethnicity, and SPA
## Los Angeles County, 2007-2011

| | 2007 (N=3) | | | 2008 (N=5) | | | 2009 (N=8) | | | 2010 (N=4) | | | 2011 (N=10) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 |
| **Age Group** | | | | | | | | | | | | | | | |
| <1 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | |
| 1-4 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | |
| 5-14 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | |
| 15-34 | 2 | 66.7 | | 1 | 20.0 | | 1 | 12.5 | | 1 | 25.0 | | 4 | 40.0 | 0.1 |
| 35-44 | 0 | 0.0 | | 1 | 20.0 | | 2 | 25.0 | | 2 | 50.0 | | 2 | 20.0 | 0.1 |
| 45-54 | 0 | 0.0 | | 2 | 40.0 | | 3 | 37.5 | | 1 | 25.0 | | 1 | 10.0 | 0.1 |
| 55-64 | 0 | 0.0 | | 0 | 0.0 | | 1 | 12.5 | | 0 | 0.0 | | 1 | 10.0 | 0.1 |
| 65+ | 0 | 0.0 | | 1 | 20.0 | | 1 | 12.5 | | 0 | 0.0 | | 2 | 20.0 | 0.2 |
| Unknown | 1 | 33.3 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | | | |
| **Race/Ethnicity** | | | | | | | | | | | | | | | |
| Asian | 0 | 0.0 | | 1 | 20.0 | | 1 | 12.5 | | 0 | 0.0 | | 1 | 10.0 | 0.1 |
| Black | 0 | 0.0 | | 0 | 0.0 | | 0 | 0 | | 0 | 0.0 | | 0 | 0.0 | 0.0 |
| Hispanic | 1 | 33.3 | | 1 | 20.0 | | 1 | 12.5 | | 1 | 25.0 | | 6 | 60.0 | 0.1 |
| White | 1 | 33.3 | | 3 | 60.0 | | 6 | 75.0 | | 3 | 75.0 | | 2 | 20.0 | 0.1 |
| Other | 0 | 0.0 | | 0 | 0.0 | | 0 | 0 | | 0 | 0.0 | | 0 | 0.0 | 0.0 |
| Unknown | 1 | 33.3 | | 0 | 0.0 | | 0 | 0 | | 0 | 0.0 | | 1 | 10.0 | |
| **SPA** | | | | | | | | | | | | | | | |
| 1 | 0 | 0.0 | | 0 | 0.0 | | 1 | 12.5 | | 0 | 0.0 | | 0 | 0.0 | 0.0 |
| 2 | 0 | 0.0 | | 3 | 60.0 | | 0 | 0.0 | | 3 | 75.0 | | 1 | 10.0 | 0.0 |
| 3 | 0 | 0.0 | | 1 | 20.0 | | 0 | 0.0 | | 0 | 0.0 | | 2 | 20.0 | 0.1 |
| 4 | 1 | 33.3 | | 0 | 0.0 | | 2 | 25.0 | | 0 | 0.0 | | 3 | 30.0 | 0.2 |
| 5 | 0 | 0.0 | | 0 | 0.0 | | 2 | 25.0 | | 0 | 0.0 | | 1 | 10.0 | 0.2 |
| 6 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | 0.0 |
| 7 | 1 | 33.3 | | 0 | 0.0 | | 1 | 12.5 | | 0 | 0.0 | | 2 | 20.0 | 0.1 |
| 8 | 0 | 0.0 | | 1 | 20.0 | | 2 | 25.0 | | 1 | 25.0 | | 1 | 10.0 | 0.1 |
| Unknown | 1 | 33.3 | | 0 | 0.0 | | 0 | 0.0 | | | | | 0 | 0.0 | 0.0 |

*Rates calculated based on less than 19 cases or events are considered unreliable.

**Figure 1. Incidence Rates* of Acute Hepatitis C LAC, CA and US, 2007-2011**




*Rates based on fewer than 19 cases are unreliable

**Figure 2. Cases of Acute Hepatitis C by Age Group LAC, 2011 (N=10)**

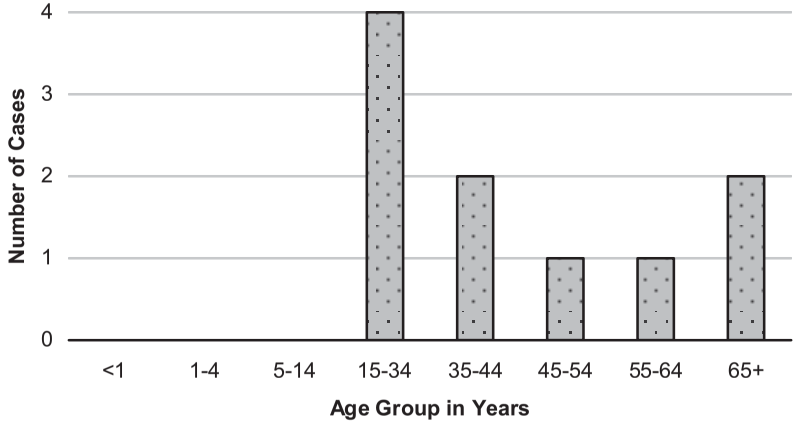
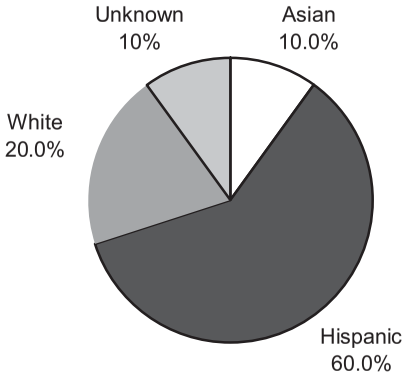



**Figure 3. Percent Cases of Acute Hepatitis C by Race/Ethnicity LAC, 2011 (N=10)**



# HEPATITIS C, ACUTE

| CRUDE DATA | |
|---|---|
| Number of Cases | 4 |
| Annual Incidence | |
| LA County | 0.04[a] |
| California[b] | -- |
| United States[b] | -- |
| Age at Diagnosis | |
| Mean | 37 |
| Median | 35 |
| Range | 26-48 years |

[a]Rates calculated based on less than 19 cases or events are considered unreliable.
[b]See Final Summary of Nationally Notifiable Infectious Diseases, United States on MMWR website http://www.cdc.gov/mmwr/mmwr_nd/index.html.

## DESCRIPTION

The Hepatitis C virus (HCV) is the most common chronic bloodborne infection in the US. This RNA virus is predominantly transmitted through contact with contaminated blood and blood products via injection drug use.

Symptoms of acute infection include jaundice, fatigue, anorexia, nausea, and vomiting; however, up to 85% of acute infections have mild or no symptoms. After acute infection, 15%-25% of persons appear to resolve their infection without sequelae as demonstrated by sustained absence of HCV RNA in serum and normalization of alanine aminotransferase (ALT) levels. Chronic HCV infection develops in 75%-85% of persons, with persistent or fluctuating ALT elevations developing in 60%-70% of chronically infected persons. In the remaining 30%-40% of chronically infected persons, ALT levels are normal. Most studies have reported that medical complications occur decades after initial infection including cirrhosis, liver failure, and hepatic cancer.

Traditional risk factors include: receipt of a blood transfusion prior to 1989, injection drug use (IDU), hemodialysis, birth to infected mothers, having multiple sexual partners, needle-sticks to healthcare or public safety workers, and tattoos or body-piercing. Sexual and perinatal transmission of HCV appears to occur much less frequently; the presence of HIV infection is associated with increased risk of infection among men engaging in certain sexual practices with other men. Household or familial contact does not increase the risk of transmission of hepatitis C. An estimated 30% of cases have no identifiable exposure risk. Health-care related transmission has been documented infrequently; however; recognition of cases associated with nonhospital health-care settings has been increasing.

Since the US introduction of blood product screening in 1989, reduction of high-risk behaviors is the primary recommendation for preventing transmission, especially, since there is no vaccine or post-exposure prophylaxis. Vaccines for hepatitis A and B do not provide immunity against hepatitis C. Educational efforts aimed at reducing high-risk behaviors (e.g., sharing injection drug and tattoo equipment, engaging in unprotected sex) may help to reduce new hepatitis C cases

For the purpose of surveillance, ACDC uses the CDC/CSTE case definition for acute hepatitis C: discrete onset of symptoms and: 1) a positive HCV test (antibody test by EIA) confirmed by a more specific test (RIBA or detection of the HCV-RNA antigen by polymerase-chain reaction [PCR]) or an EIA signal to cutoff ratio of ≥3.8; 2) serum ALT greater than 400; and 3) no evidence of either acute hepatitis A or B disease.

## 2010 TRENDS AND HIGHLIGHTS

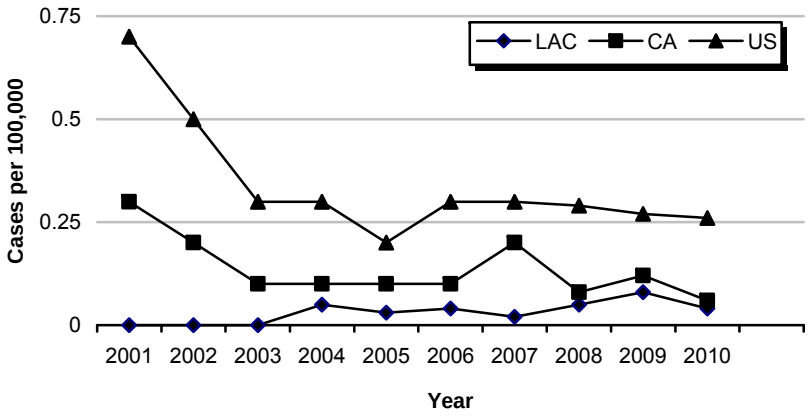
- 46 reports of possible hepatitis C were investigated in 2010 but only four (9%) were found to meet the CDC/CSTE case criteria for acute hepatitis C.
- The four cases ranged in age from 26 to 48 years; the median age was 35 and the mean age was 37 years (Figure 2).
- The majority of cases were white (N=3, 75%) (Figure 3).
- The male to female ratio was 1:1.
- Risk factors were identified in 100% (n=4) of the confirmed cases, including some with multiple risk factors. Using street drugs but not injecting was the most common risk factor reported (n=3, 75%), followed by having contact with a suspect or confirmed case (n=2, 50%), exposure to someone else's blood (n=1, 25%), injection of street drugs (n=1, 25%), having multiple sexual partners (n=1, 25%) and incarceration (n=1, 25%).

## Reported Hepatitis C, Acute Cases and Rates* per 100,000 by Age Group, Race/Ethnicity, and SPA
## Los Angeles County, 2006-2010

| | 2006 (N=4) | | | 2007 (N=3) | | | 2008 (N=5) | | | 2009 (N=8) | | | 2010 (N=4) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 |
| **Age Group** | | | | | | | | | | | | | | | |
| <1 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | |
| 1-4 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | |
| 5-14 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | |
| 15-34 | 0 | 0.0 | | 2 | 66.7 | | 1 | 20.0 | | 1 | 12.5 | | 1 | 25.0 | |
| 35-44 | 2 | 50.0 | | 0 | 0.0 | | 1 | 20.0 | | 2 | 25.0 | | 2 | 50.0 | |
| 45-54 | 0 | 0.0 | | 0 | 0.0 | | 2 | 40.0 | | 3 | 37.5 | | 1 | 25.0 | |
| 55-64 | 1 | 25.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 12.5 | | 0 | 0.0 | |
| 65+ | 1 | 25.0 | | 0 | 0.0 | | 1 | 20.0 | | 1 | 12.5 | | 0 | 0.0 | |
| Unknown | 0 | 0.0 | | 1 | 33.3 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | |
| **Race / Ethnicity** | | | | | | | | | | | | | | | |
| Asian | 0 | 0.0 | | 0 | 0.0 | | 1 | 20.0 | | 1 | 12.5 | | 0 | 0.0 | |
| Black | 1 | 25.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0 | | 0 | 0.0 | |
| Hispanic | 2 | 50.0 | | 1 | 33.3 | | 1 | 20.0 | | 1 | 12.5 | | 1 | 25.0 | |
| White | 1 | 25.0 | | 1 | 33.3 | | 3 | 60.0 | | 6 | 75.0 | | 3 | 75.0 | |
| Other | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0 | | 0 | 0.0 | |
| Unknown | 0 | 0.0 | | 1 | 33.3 | | 0 | 0.0 | | 0 | 0 | | 0 | 0.0 | |
| **SPA** | | | | | | | | | | | | | | | |
| 1 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 12.5 | | 0 | 0.0 | |
| 2 | 0 | 0.0 | | 0 | 0.0 | | 3 | 60.0 | | 0 | 0.0 | | 3 | 75.0 | |
| 3 | 0 | 0.0 | | 0 | 0.0 | | 1 | 20.0 | | 0 | 0.0 | | 0 | 0.0 | |
| 4 | 0 | 0.0 | | 1 | 33.3 | | 0 | 0.0 | | 2 | 25.0 | | 0 | 0.0 | |
| 5 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 2 | 25.0 | | 0 | 0.0 | |
| 6 | 1 | 25.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | |
| 7 | 0 | 0.0 | | 1 | 33.3 | | 0 | 0.0 | | 1 | 12.5 | | 0 | 0.0 | |
| 8 | 2 | 50.0 | | 0 | 0.0 | | 1 | 20.0 | | 2 | 25.0 | | 1 | 25.0 | |
| Unknown | 1 | 25.0 | | 1 | 33.3 | | 0 | 0.0 | | 0 | 0.0 | | | | |

*Rates calculated based on less than 19 cases or events are considered unreliable.

**Figure 1. Incidence Rates* of Acute Hepatitis C**
**LAC, CA and US, 2001-2010**




*Rates based on fewer than 19 cases are unreliable

**Figure 2. Cases of Acute Hepatitis C by Age Group**
**LAC, 2010 (N=4)**

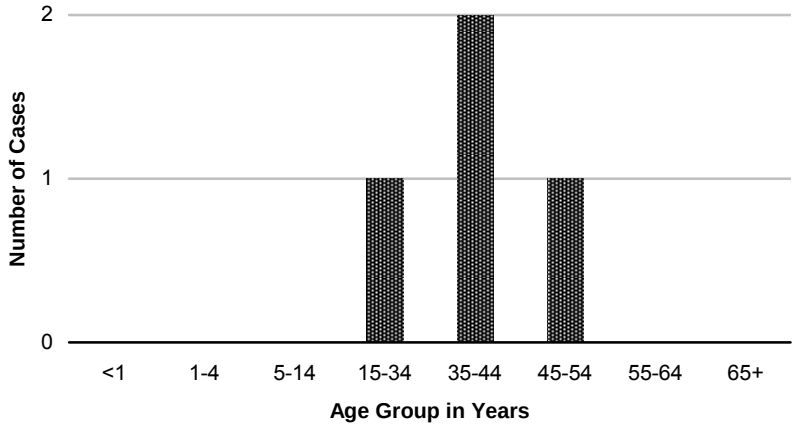
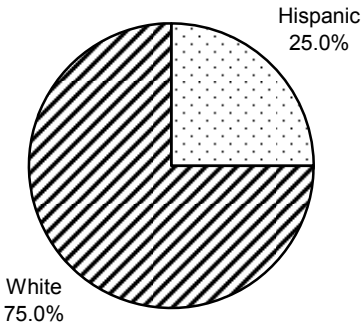



**Figure 3. Percent Cases of Acute Hepatitis C by Race/Ethnicity**
**LAC, 2010 (N=4)**



# HEPATITIS C, ACUTE

| CRUDE DATA | |
|---|---|
| Number of Cases | 8 |
| Annual Incidence | |
| LA County | 0.08[a] |
| California[b] | 0.08 |
| United States[b] | 0.29 |
| Age at Diagnosis | |
| Mean | 48 |
| Median | 48 |
| Range | 20-80 years |

[a]Rates calculated based on less than 19 cases or events are considered unreliable.
[b]Calculated from Final 2008 Reports of Nationally Notifiable Infectious Disease. MMWR 58(31);856-857;859-869.

## DESCRIPTION

The Hepatitis C virus (HCV) is the most common chronic bloodborne infection in the US. This RNA virus is predominantly transmitted through contact with contaminated blood and blood products via injection drug use.

Symptoms of acute infections can include jaundice, fatigue, anorexia, nausea, or vomiting; however, up to 85% of acute infections have mild or no symptoms. After acute infection, 15%-25% of persons appear to resolve their infection without sequelae as demonstrated by sustained absence of HCV RNA in serum and normalization of alanine aminotransferase (ALT) levels. Chronic HCV infection develops in 75%-85% of persons with persistent or fluctuating ALT elevations developing in 60%-70% of chronically infected persons. In the remaining 30%-40% of chronically infected persons, ALT levels are normal. Most studies have reported that medical complications occur decades after initial infection including cirrhosis, liver failure, and hepatic cancer.

Traditional risk factors include: anyone who has had a blood transfusion prior to 1989, IV drug users (IDU), hemodialysis patients, infants born to infected mothers, those with multiple sexual partners, healthcare workers who suffer needle-stick accidents, and people with tattoos or body-piercing. Sexual and perinatal transmission of HCV appears to occur much less frequently. Household or familial contact is not considered a risk factor for the transmission of hepatitis C. An estimated 30% have no identifiable risk of exposure. Health-care related transmission has been documented infrequently however; recognition of cases associated with nonhospital health-care settings has been increasing.

The reduction of high-risk behaviors is the primary recommendation for preventing transmission; especially, since there is no effective vaccine or post-exposure prophylaxis. Vaccines for hepatitis A and B do not provide immunity against hepatitis C. Educational efforts aimed at reducing high-risk behaviors (e.g., sharing injection drug equipment, engaging in unprotected sex) may help to reduce new hepatitis C cases

For the purpose of surveillance, ACDC uses the CDC/CSTE criteria for acute hepatitis C: discrete onset of symptoms and: 1) a positive HCV test (antibody test by EIA) confirmed by a more specific test (RIBA or detection of the HCV-RNA antigen by polymerase-chain reaction [PCR]) or an EIA signal to cutoff ratio of≥3.8; 2) serum ALT greater than 400; and 3) no evidence of either acute hepatitis A or B disease.

In the US in 2007, traditional risk factors, including IDU, were the most common risk factors identified, for acute infections. In Los Angeles County in 2009, the most common risk factors reported have been nosocomial (health-care related).

## 2009 TRENDS AND HIGHLIGHTS

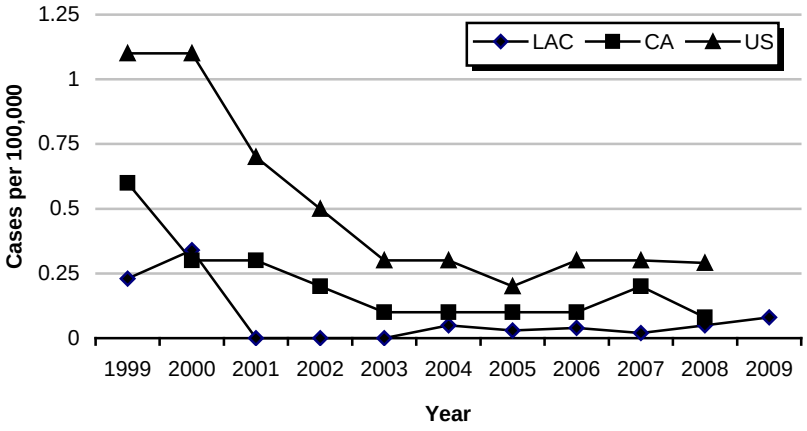
- 58 reported cases of hepatitis C were investigated in 2009 but only eight cases (14%) were found to meet the CDC/CSTE case criteria for acute hepatitis C (versus 5 cases in 2008)..
- The eight cases ranged in age from 20 to 80 years; both the median age and mean age was 48 years (Figure 2).
- The majority of cases were white (74%, n=6) (Figure 3).
- Risk factors were identified in 86% (n=6) of the confirmed cases interviewed, (including some with multiple risk factors). Of those with risk factors, receiving IM injections and/or IV infusions (n=4, 57%) and having a medical procedure (n=4, 57%) were the most common risk factors followed by having a dental procedure (n=3, 43%).

## Reported Hepatitis C, Acute Cases and Rates* per 100,000 by Age Group, Race/Ethnicity, and SPA
## Los Angeles County, 2005-2009

| | 2005 (N=3) | | | 2006 (N=4) | | | 2007 (N=3) | | | 2008 (N=5) | | | 2009 (N=8) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 |
| **Age Group** | | | | | | | | | | | | | | | |
| <1 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0 | 0 |
| 1-4 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0 | 0 |
| 5-14 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0 | 0 |
| 15-34 | 1 | 33.3 | 0.0 | 0 | 0.0 | 0.0 | 2 | 66.7 | 0.1 | 1 | 20.0 | 0.0 | 1 | 12.5 | 0 |
| 35-44 | 1 | 33.3 | 0.1 | 2 | 50.0 | 0.1 | 0 | 0.0 | 0.0 | 1 | 20.0 | 0.1 | 2 | 25.0 | 0.1 |
| 45-54 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 2 | 40.0 | 0.1 | 3 | 37.5 | 0.2 |
| 55-64 | 1 | 33.3 | 0.1 | 1 | 25.0 | 0.1 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 12.5 | 0.1 |
| 65+ | 0 | 0.0 | 0.0 | 1 | 25.0 | 0.1 | 0 | 0.0 | 0.0 | 1 | 20.0 | 0.1 | 1 | 12.5 | 0.1 |
| Unknown | 0 | 0.0 | | 0 | 0.0 | | 1 | 33.3 | | 0 | 0.0 | | 0 | 0 | |
| **Race / Ethnicity** | | | | | | | | | | | | | | | |
| Asian | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 20.0 | 0.1 | 1 | 12.5 | 0.1 |
| Black | 0 | 0.0 | 0.0 | 1 | 25.0 | 0.1 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0 | 0 |
| Hispanic | 0 | 0.0 | 0.0 | 2 | 50.0 | 0.0 | 1 | 33.3 | 0.0 | 1 | 20.0 | 0.0 | 1 | 12.5 | 0 |
| White | 3 | 100. | 0.1 | 1 | 25.0 | 0.0 | 1 | 33.3 | 0.0 | 3 | 60.0 | 0.1 | 6 | 75.0 | 0.2 |
| Other | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0 | 0 |
| Unknown | 0 | 0.0 | | 0 | 0.0 | | 1 | 33.3 | | 0 | 0.0 | | 0 | 0 | |
| **SPA** | | | | | | | | | | | | | | | |
| 1 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 12.5 | 0.3 |
| 2 | 1 | 33.3 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 3 | 60.0 | 0.1 | 0 | 0 | 0 |
| 3 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 20.0 | 0.1 | 0 | 0 | 0 |
| 4 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 33.3 | 0.1 | 0 | 0.0 | 0.0 | 2 | 25.0 | 0.2 |
| 5 | 2 | 66.7 | 0.3 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 2 | 25.0 | 0.3 |
| 6 | 0 | 0.0 | 0.0 | 1 | 25.0 | 0.1 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0 | 0 |
| 7 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 33.3 | 0.1 | 0 | 0.0 | 0.0 | 1 | 12.5 | 0.1 |
| 8 | 0 | 0.0 | 0.0 | 2 | 50.0 | 0.2 | 0 | 0.0 | 0.0 | 1 | 20.0 | 0.1 | 2 | 25.0 | 0.2 |
| Unknown | 0 | 0.0 | | 1 | 25.0 | | 1 | 33.3 | | 0 | 0.0 | | 0 | 0 | |

*Rates calculated based on less than 19 cases or events are considered unreliable.

**Figure 1. Incidence Rates* of Acute Hepatitis C LAC, CA and US, 1999-2009**




*Rates based on fewer than 19 cases are unreliable

**Figure 2. Cases of Acute Hepatitis C by Age Group LAC, 2009 (N=8)**

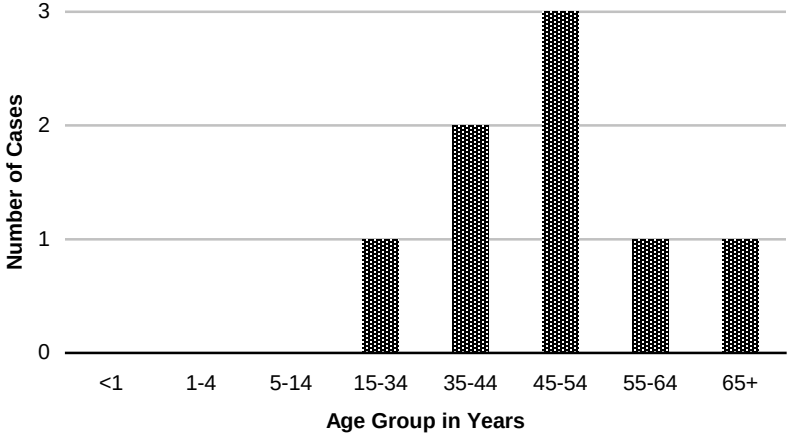
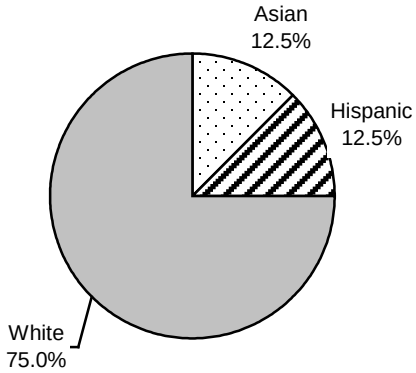



**Figure 3. Percent Cases of Acute Hepatitis C by Race/Ethnicity LAC, 2009 (N=8)**



# HEPATITIS C, ACUTE

| CRUDE DATA | |
|---|---|
| Number of Cases | 5 |
| Annual Incidence | |
| LA County | 0.05[a] |
| California[b] | 0.08 |
| United States[b] | 0.29 |
| Age at Diagnosis | |
| Mean | 48 |
| Median | 42 |
| Range | 32-72 years |

[a]Rates calculated based on less than 19 cases or events are considered unreliable.
[b]Calculated from Final 2008 Reports of Nationally Notifiable Infectious Disease. MMWR 58(31);856-857;859-869.

## DESCRIPTION

The Hepatitis C virus (HCV) is the most common chronic bloodborne infection in the US. This RNA virus is predominantly transmitted through contact with contaminated blood and blood products via injection drug use. Sexual and perinatal transmission of HCV appears to occur much less frequently. People at risk include: anyone who has had a blood transfusion prior to 1989, IV drug users, hemodialysis patients, infants born to infected mothers, those with multiple sexual partners, health care workers who suffer needle-stick accidents, and people with tattoos or body-piercing. However, an estimated 30% have no identifiable history of exposure to the virus. Household or familial contact is not considered a risk factor for the transmission of hepatitis C. There is no vaccine available for HCV and vaccines for hepatitis A and B do not provide immunity against hepatitis C.

Symptoms of acute infections can include jaundice, fatigue, anorexia, nausea, or vomiting; however, up to 85% of acute infections have mild or no symptoms. After acute infection, 15%-25% of persons appear to resolve their infection without sequelae as demonstrated by sustained absence of HCV RNA in serum and normalization of alanine aminotransferase (ALT) levels. Chronic HCV infection develops in (75%-85%) of persons with persistent or fluctuating ALT elevations developing in 60%-70% of

chronically infected persons. In the remaining 30%-40% of chronically infected persons, ALT levels are normal. Most studies have reported that medical complications occur decades after initial infection including cirrhosis, liver failure, and hepatic cancer.

For the purpose of surveillance, ACDC uses the CDC/CSTE criteria for acute hepatitis C: discrete onset of symptoms and: 1) a positive HCV test (antibody test by EIA) confirmed by a more specific test (RIBA or detection of the HCV-RNA antigen by polymerase-chain reaction [PCR]) or an EIA signal to cutoff ratio of ≥3.8; 2) serum ALT greater than 400; and 3) no evidence of either acute hepatitis A or B disease.

Universal blood product screening in 1990 and heat-inactivation of other blood concentrates initiated in 1987 have dramatically reduced recipient-associated cases of hepatitis C. This leaves the reduction of high-risk behaviors as the primary recommendation for preventing transmission; especially, since there is no effective vaccine or post-exposure prophylaxis. Educational efforts aimed at reducing high-risk behaviors (e.g., sharing injection drug equipment, engaging in unprotected sex) may help to reduce new hepatitis C cases. Additional education provided to those who already have hepatitis C is important because alcohol consumption and co-infection with HIV can accelerate the progression of cirrhosis and hepatocellular carcinoma. Furthermore, patients with chronic hepatitis C should be encouraged to receive hepatitis A and B vaccine and evaluated for severity of their liver diseases and for possible treatment.

## 2008 TRENDS AND HIGHLIGHTS

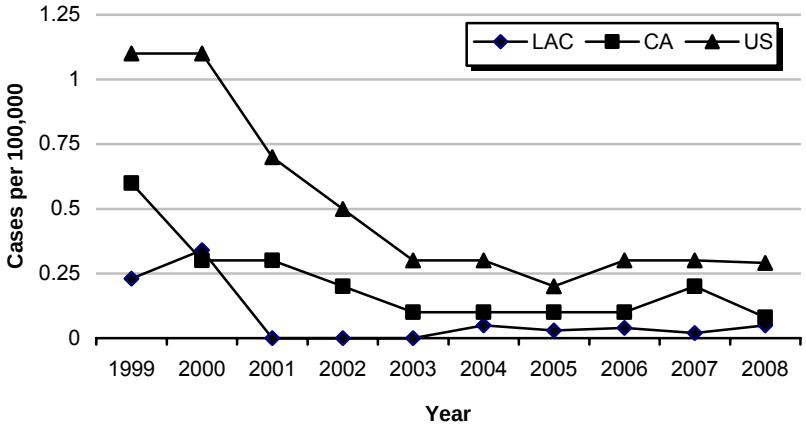
- There were five cases of confirmed acute hepatitis C in 2008 compared to two acute cases in 2007.
- The five cases ranged in age from 32 to 72 years; the median age was 51years; the mean age was 48 years (Figure 2).
- The majority of cases were white (60%, n=3), followed by Asian (20%, n=1) and Hispanic (20%, n=1) (Figure 3).
- Risk factors were identified in 60% (n=3) of the confirmed cases, including some with multiple risk factors. The most common risk factors identified were contact with known/suspect hepatitis C infected person (n=2, 67%), resident of long-term care facility (n=2, 67%), and receiving fingersticks (n=2, 67%).

## Reported Hepatitis C, Acute Cases and Rates* per 100,000 by Age Group, Race/Ethnicity, and SPA
## Los Angeles County, 2004-2008

| | 2004 | | | 2005 | | | 2006 | | | 2007 | | | 2008 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 |
| **Age Group** | | | | | | | | | | | | | | | |
| <1 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 1-4 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 5-14 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 15-34 | 1 | 20.0 | 0.0 | 1 | 33.3 | 0.0 | 0 | 0.0 | 0.0 | 2 | 66.7 | 0.1 | 1 | 20.0 | 0.0 |
| 35-44 | 0 | 0.0 | 0.0 | 1 | 33.3 | 0.1 | 2 | 50.0 | 0.1 | 0 | 0.0 | 0.0 | 1 | 20.0 | 0.1 |
| 45-54 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 2 | 40.0 | 0.1 |
| 55-64 | 1 | 20.0 | 0.1 | 1 | 33.3 | 0.1 | 1 | 25.0 | 0.1 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 65+ | 3 | 60.0 | 0.3 | 0 | 0.0 | 0.0 | 1 | 25.0 | 0.1 | 0 | 0.0 | 0.0 | 1 | 20.0 | 0.1 |
| Unknown | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 33.3 | | 0 | 0.0 | |
| **Race / Ethnicity** | | | | | | | | | | | | | | | |
| Asian | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 20.0 | 0.1 |
| Black | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 25.0 | 0.1 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| Hispanic | 1 | 20.0 | 0.0 | 0 | 0.0 | 0.0 | 2 | 50.0 | 0.0 | 1 | 33.3 | 0.0 | 1 | 20.0 | 0.0 |
| White | 4 | 80.0 | 0.1 | 3 | 100. | 0.1 | 1 | 25.0 | 0.0 | 1 | 33.3 | 0.0 | 3 | 60.0 | 0.1 |
| Other | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| Unknown | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 1 | 33.3 | | 0 | 0.0 | |
| **SPA** | | | | | | | | | | | | | | | |
| 1 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 2 | 3 | 60.0 | 0.1 | 1 | 33.3 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 3 | 60.0 | 0.1 |
| 3 | 1 | 20.0 | 0.1 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 20.0 | 0.1 |
| 4 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 33.3 | 0.1 | 0 | 0.0 | 0.0 |
| 5 | 0 | 0.0 | 0.0 | 2 | 66.7 | 0.3 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 6 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 25.0 | 0.1 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 7 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 1 | 33.3 | 0.1 | 0 | 0.0 | 0.0 |
| 8 | 1 | 20.0 | 0.1 | 0 | 0.0 | 0.0 | 2 | 50.0 | 0.2 | 0 | 0.0 | 0.0 | 1 | 20.0 | 0.1 |
| Unknown | 0 | 0.0 | | 0 | 0.0 | | 1 | 25.0 | | 1 | 33.3 | | 0 | 0.0 | |

*Rates calculated based on less than 19 cases or events are considered unreliable.

**Figure 1. Incidence Rates* of Acute Hepatitis C LAC, CA and US, 1999-2008**




*Rates based on fewer than 19 cases are unreliable

**Figure 2. Cases of Acute Hepatitis C by Age Group LAC, 2008 (N=5)**

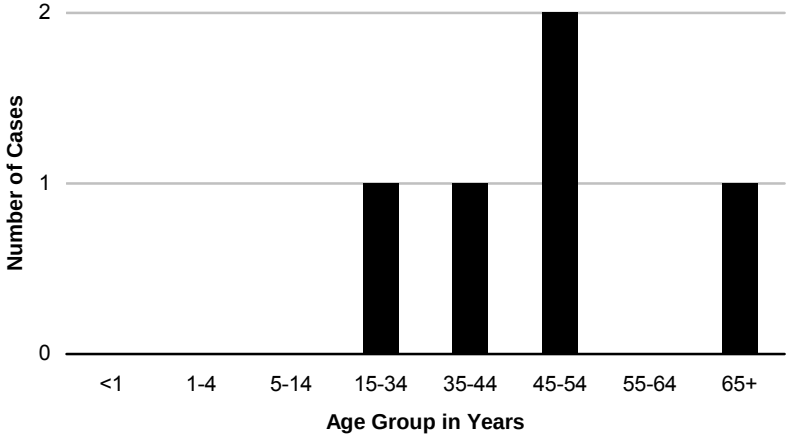
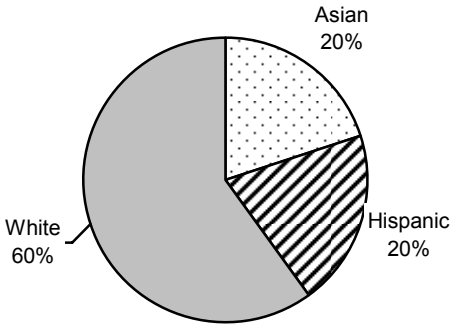



**Figure 3. Percent Cases of Acute Hepatitis C by Race/Ethnicity LAC, 2008 (N=5)**



# HEPATITIS C, ACUTE

| CRUDE DATA | |
|---|---|
| Number of Cases | 2 |
| Annual Incidence | |
| LA County | ---[a] |
| California | 0.20[b] |
| United States | 0.24[b] |

[a] Rates based on fewer than 20 cases are unreliable.
[b] Calculated from 2008 Summary of notifiable diseases issue of MMWR (561360-1371).

## DESCRIPTION

The Hepatitis C virus (HCV) is the most common chronic bloodborne infection in the US. This RNA virus is predominantly transmitted through contact with contaminated blood and blood products via injection drug use. Sexual and perinatal transmission of HCV appears to occur less frequently. People at risk include: anyone who has had a blood transfusion prior to 1989, IV drug users, hemodialysis patients, infants born to infected mothers, those with multiple sexual partners, health care workers who suffer needle-stick accidents, and people with tattoos or body-piercing. However, an estimated 30% have no identifiable history of exposure to the virus. Household or familial contact is not considered a risk factor for the transmission of hepatitis C. There is no vaccine available for HCV, and vaccines for hepatitis A and B do not provide immunity against hepatitis C.

Symptoms of acute infections can include jaundice, fatigue, anorexia, nausea, or vomiting; however, up to 85% of acute infections have mild or no symptoms and usually go undetected. After acute infection, 15%-25% of persons appear to resolve their infection without sequelae as defined by sustained absence of HCV RNA in serum and normalization of ALT levels. Chronic HCV infection develops in most persons (75%-85%) with persistent or fluctuating ALT elevations indicating active liver diseases developing in 60%-70% of chronically infected persons. In the remaining 30%-40% of chronically infected persons, ALT levels are normal. No clinical or epidemiologic features among patients with acute infection have been found to be predictive of either persistent infection or chronic liver disease (CDC, 1998). Most studies have reported that medical complications occur decades after initial infection including cirrhosis, liver failure, and hepatic cancer.

ACDC uses the CDC/CSTE criteria for acute hepatitis C to standardize surveillance of this infection. The criteria include discrete onset of symptoms and:

- a positive HCV test (antibody test by EIA) confirmed by a more specific test (RIBA or detection of the HCV-RNA antigen by polymerase-chain reaction [PCR]) or an EIA signal to cutoff ratio of $\geq$3.8;
- serum alanine aminotransferase (ALT) greater than 400; and
- no evidence of either acute hepatitis A or B disease.

The purpose of standardizing surveillance is to more accurately monitor trends in hepatitis C, compare local data with state and national data, improve identification of risk groups, and develop and evaluate prevention programs.

## DISEASE ABSTRACT

- There were 2 cases of confirmed acute hepatitis C in 2007, compare to 4 cases confirmed in 2006.
- The 2 acute cases were in a 21-year-old white female and a 31-year-old Hispanic female.
- One case reported multiple risk factors including contact with a known case, dental work, exposure to blood, accupuncture, tattoo, body piercing, drug use, and incarceration. The other case did not report any risk factors.

## COMMENTS

There were 144 suspect cases initially reported to have acute hepatitis C in 2007 as compared to 158 suspects reported in 2006. Upon further investigation, only two, 1% met the acute hepatitis C surveillance criteria. The stringent criteria for acute hepatitis C illustrate the difficulty of confirming acute hepatitis C for surveillance purposes. It is likely that this data reflects an under-identification of acute hepatitis C in those cases reported to Public Health. Furthermore, since most people have no symptoms or limited, non-specific symptoms in the acute stage of hepatitis C and therefore are never diagnosed or reported to Public Health, there are likely many more new cases of acute hepatitis C in Los Angeles county each year.

There were limitations to the data collected. The data did not provide enough information for monitoring trends in transmission patterns.

Although the number of verified cases of acute hepatitis C has declined over the past 5 years, there is still a substantial burden of disease on the population from chronic hepatitis C. It is very important for improvements on monitoring changes in acute disease incidence and risk factors for infection be used to assess comprehensively the burden of disease caused by HCV infection in LA County. Public Health began to use a new risk factor form in 2007, and it is hoped that better identification of risk factors, to aid in prevention programs, will follow.

## PREVENTION

Universal blood product screening in 1990 and heat-inactivation of other blood concentrates initiated in 1987 have dramatically reduced recipient-associated cases of hepatitis C. This leaves the reduction of high-risk behaviors as the primary recommendation for preventing transmission; especially, since there is no effective vaccine or post-exposure prophylaxis. Educational efforts aimed at reducing high-risk behaviors (e.g., sharing injection drug equipment, engaging in unprotected sex) may help to reduce new hepatitis C cases. Additional education provided to those who already have hepatitis C is important because alcohol consumption and co-infection with HIV can accelerate the progression of cirrhosis and hepatocellular carcinoma. Furthermore, patients with chronic hepatitis C should be encouraged to receive hepatitis A and B vaccine and evaluated for severity of their liver diseases and for possible treatment.

## REFERENCES

Centers for Disease Control and Prevention (1998). Recommendation for prevention and control of hepatitis C virus (HCV) infection and HCV related chronic disease. *Morbidity and Mortality Weekly Report*, 47(RR19), 1-39. Retrieved October 31, 2008, from the CDC Web site: http://www.cdc.gov/mmwr/preview/mmwrhtml/00055154.htm

## ADDITIONAL RESOURCES

General information about hepatitis is available from the CDC at:
http://www.cdc.gov/hepatitis/index.htm

Further information about hepatitis is available from:

- American Liver Foundation – http://www.liverfoundation.org
- Hepatitis Foundation International – http://www.hepfi.org/living/index.htm

Publications:

Centers for Disease Control and Prevention (2003). Guidelines for laboratory testing and result reporting of antibody to hepatitis C virus. *Morbidity and Mortality Weekly Report*, 52(RR03), 1-16. Retrieved October 31, 2008, from the CDC Web site: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5203a1.htm

Centers for Disease Control and Prevention (2007). Use of enhanced surveillance for hepatitis C virus infection to detect a cluster among young injection-drug users—New York, November 2004—April 2007. *Morbidity and Mortality Weekly Report*, 57(19), 517-521.

Centers for Disease Control and Prevention (2008). Acute hepatitis C virus infections attributed to unsafe injection practices at an endoscopy clinic—Nevada, 2007. *Morbidity and Mortality Weekly Report*, 57(19), 513-517. Retrieved October 13, 2008, from the CDC Web site: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5719a2.htm

Centers for Disease Control and Prevention (2008). Surveillance for acute viral hepatitis—United States, 2006. *Morbidity and Mortality Weekly Report*, 57(SS02), 1-24. Retrieved October 31, 2008, from the CDC Web site: http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5702a1.htm

# HEPATITIS C, ACUTE

| CRUDE DATA | |
|---|---|
| Number of Cases | 4 |
| Annual Incidence | |
| LA County | 0.04[a] |
| California | 0.07[b] |
| United States | 0.26[b] |

[a] Rates based on fewer than 19 cases are unreliable.
[b] Calculated from 2007 Summary of notifiable diseases issue of MMWR (56:853-863).

## DESCRIPTION

The Hepatitis C virus (HCV) is the most common bloodborne infection in the US. This RNA virus is predominantly transmitted through contact with contaminated blood and blood products via injection drug use. Sexual and perinatal transmission of HCV appears to occur less frequently. People at risk include: anyone who has had a blood transfusion prior to 1989, IV drug users, hemodialysis patients, infants born to infected mothers, those with multiple sexual partners, health care workers who suffer needle-stick accidents, and people with tattoos or body-piercing. However, an estimated 30% have no identifiable history of exposure to the virus. Household or familial contact is not considered a risk factor for the transmission of hepatitis C. There is no vaccine available for HCV and vaccines for hepatitis A and B do not provide immunity against hepatitis C.

Symptoms of acute infections can include jaundice, fatigue, anorexia, nausea, or vomiting; however, up to 85% of acute infections have mild or no symptoms and usually go undetected. After acute infection, 15%-25% of persons appear to resolve their infection without sequelae as defined by sustained absence of HCV RNA in serum and normalization of ALT levels. Chronic HCV infection develops in most persons (75%-85%) with persistent or fluctuating ALT elevations indicating active liver diseases developing in 60%-70% of chronically infected persons. In the remaining 30%-40% of chronically infected persons, ALT levels are normal. No clinical or epidemiologic features among patients with acute infection have been found to be predictive of either persistent infection or chronic liver disease [1]. Most studies have reported that medical complications occur decades after initial infection including cirrhosis, liver failure, and hepatic cancer.

ACDC uses the CDC/CSTE criteria for acute hepatitis C to standardize surveillance of this infection. The criteria include discrete onset of symptoms and:

1. A positive HCV test (antibody test EIA) confirmed by a more specific test (RIBA or detection of the HCV-RNA antigen by polymerase-chain reaction [PCR]) or an EIA signal to cutoff ratio of $\geq$3.8;
2. Serum alanine aminotransferase (ALT) greater than 400; and
3. No evidence of either acute hepatitis A or B disease.

The purpose of standardizing surveillance is to allow ACDC to more accurately monitor trends in hepatitis C, compare local data with state and national data, and improve identification of risk groups, and develop and evaluate prevention programs.

## DISEASE ABSTRACT

- There were four cases of confirmed acute hepatitis C in 2006, compare to 3 cases confirmed in 2005.
- No fatal cases of acute hepatitis C were reported in 2006.
- All cases were white.

## STRATIFIED DATA

**Seasonality**: None.

**Age**: Cases ranged in age from 43 to 85 years (the median age was 51; the mean age was 58).

**Sex**: In 2006, the male-to-female rate ratio was 3:1, which differed compared to the previous year (1:2 in 2005)

**Race/Ethnicity**: In 2006, all cases were white. It remained the same as the previous year.

**Location**: SPA 8 (n=2) had the most cases, followed by SPA 6 (n=1) and homeless (n=1), respectively.

**Risk Factors**: Of the four confirmed acute cases, risk factors were identified in 50% (n=2) of the cases (including some cases with multiple risk factors). The most commonly identified risk factor for infection were multiple sexual partners and injection drug use (n=2), followed by MSM (n=1) and being in contact with another case (n=1), respectively.

## COMMENTS

There were 158 cases initially reported to have acute hepatitis C in 2006 as compared to 79 cases reported in 2005. Upon further investigation, only four, 3% (n=3; 4% in 2005) met the acute hepatitis C surveillance criteria. The stringent criteria for acute hepatitis C illustrates the difficulty of counting initially reported cases as confirmed acute hepatitis C for surveillance purposes. Therefore, it is likely that this data reflects an under-identification of acute hepatitis C in those cases reported to Public Health. Furthermore, since most people have no symptoms or limited, non-specific symptoms in the acute stage of hepatitis C and therefore never diagnosed or reported to Public Health, there are likely many more new cases of acute hepatitis C in Los Angeles County each year.

There were limitations to the data collected. The data did not provide enough information for monitoring trends in transmission patterns. Half of the cases denied having risk factors for infection. The two cases that reside in SPA 8 (Harbor HD) lived in the same census tract. After further investigation, no link could be established between these cases.

Although the number of new cases of acute hepatitis C has declined over the past 5 years, there is still a substantial burden of disease on the population from chronic hepatitis C. It is very important for improvements on monitoring changes in acute disease incidence and risk factors for infection be used to assess comprehensively the burden of disease caused by HCV infection in LA County. LAC DPH will use a new risk factor form starting in 2007 and it is hoped that better identification of risk factors, to aid in prevention programs, will follow.

## PREVENTION

Universal blood product screening in 1990 and heat-inactivation of other blood concentrates initiated in 1987 have dramatically reduced recipient-associated cases of hepatitis C. This leaves the reduction of high-risk behaviors as the primary recommendation for preventing transmission; especially, since there is no effective vaccine or post-exposure prophylaxis. Educational efforts aimed at reducing high-risk behaviors (e.g., sharing injection drug equipment, engaging in unprotected sex), may help to reduce new hepatitis C cases. Additional education provided to those who already have hepatitis C is important because alcohol consumption and co-infection with HIV can accelerate the progression of cirrhosis and

hepatocellular carcinoma. Furthermore, patients with chronic hepatitis C should be encouraged to receive hepatitis A and B vaccine and evaluated for severity of their liver diseases and for possible treatment.

## REFERENCES

1. CDC. Recommendation for prevention and control of hepatitis C virus (HCV) infection and HCV related chronic disease. MMWR 1998; 47(RR19):1-39. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/00055154.htm

## ADDITIONAL RESOURCES

Further information about hepatitis is available from:

- American Liver Foundation – www.liverfoundation.org
- Hepatitis Foundation International – www.hepfi.org/living/index.htm
- CDC – www.cdc.gov/ncidod/diseases/hepatitis

Publications:

CDC. Guidelines for laboratory testing and result reporting of antibody to hepatitis C virus. MMWR 2003; 52(RR03):1-16. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/rr5203a1.htm

CDC. Surveillance for acute viral hepatitis--United States, 2005. MMWR 2007; 56(SS03):1-24. Available at: www.cdc.gov/mmwr/preview/mmwrhtml/ss5603a1.htm

# HEPATITIS C, ACUTE

| CRUDE DATE | |
|---|---|
| Number of Cases | 3 |
| Annual Incidence | |
| LA County | N/A |
| California | N/A |
| United States | N/A |
| Case Fatality | |
| LA County | N/A |
| United States | N/A |

[a] Rates based on fewer than 20 cases are unreliable.

## DESCRIPTION

The Hepatitis C virus (HCV) is the most common bloodborne infection in the US. This RNA virus is predominantly transmitted through contact with contaminated blood and blood products via injection drug use. Sexual and perinatal transmission of HCV appears to occur less frequently. People at risk include: anyone who has had a blood transfusion prior to 1989, IV drug users, hemodialysis patients, infants born to infected mothers, those with multiple sexual partners, health care workers who suffer needle-stick accidents, and people with tattoos or body-piercing. However, an estimated 30% have no identifiable history of exposure to the virus. Household or familial contact is not considered a risk factor for the transmission of hepatitis C. There is no vaccine available for HCV and vaccines for hepatitis A and B do not provide immunity against hepatitis C.

Symptoms of acute infections can include jaundice, fatigue, anorexia, nausea, or vomiting; however, up to 85% of acute infections have mild or no symptoms and usually go undetected. After acute infection, 15%-25% of persons appear to resolve their infection without sequelae as defined by sustained absence of HCV RNA in serum and normalization of ALT levels. Chronic HCV infection develops in most persons (75%-85%) with persistent or fluctuating ALT elevations indicating active liver diseases developing in 60%-70% of chronically infected persons. In the remaining 30%-40% of chronically infected persons, ALT levels are normal. No clinical or epidemiologic features among patients with acute infection have been found to be predictive of either persistent infection or chronic liver disease [1]. Most studies have reported that medical complications occur decades after initial infection including cirrhosis, liver failure, and hepatic cancer.

ACDC uses the CDC/CSTE criteria for acute hepatitis C to standardize surveillance of this infection. The criteria include discrete onset of symptoms and:

1. A positive HCV test (antibody test EIA) confirmed by a more specific test (RIBA or detection of the HCV-RNA antigen by polymerase-chain reaction [PCR]) or an EIA signal to cutoff ratio of $\geq$3.8; and
2. Serum alanine aminotransferase (ALT) greater than 7 times the upper limit of normal; and
3. No evidence of either acute hepatitis A or B disease.

The purpose of standardizing surveillance is to allow ACDC to more accurately monitor trends in hepatitis C, compare local data with state and national data, and improve identification of risk groups.

**DISEASE ABSTRACT**

- There were three cases of confirmed acute hepatitis C in 2005, which is a decrease from 5 confirmed cases in 2004.
- Two female cases received multiple facial treatments.
- All cases were White.

**STRATIFIED DATA**

**Seasonality**: None.

**Age**: Cases ranged in age from 19 to 59 years (the median age was 36).

**Sex**: In 2005, the male to female rate ratio was 1:2. Male-to-female ratios has changed compared to the previous year (4:1 in 2004)

**Race/Ethnicity**: In 2005, all cases were White. It remained the same as the previous year.

**Location**: SPA 5 (n=2) had the most cases, followed by SPA 2 (n=1).

**COMMENTS**

There were 79 cases initially reported to have acute hepatitis C in 2005, but upon further investigation, only three (4%) met the acute hepatitis C surveillance criteria. This stringent criteria illustrates the difficulty of counting reported cases as acute hepatitis C for surveillance purposes. Therefore, it is likely that this data reflects an underreporting of acute hepatitis C cases. Furthermore, since some cases have mild signs and symptoms of hepatitis C in their acute stages, most of the time they may be first identified during the chronic stage.

There were limitations to the data collected. The data did not provide enough information for monitoring trends in transmission patterns. The majority of cases denied having risk factors for infection. The two female cases that reside in SPA 5 (West HD) had received multiple facial treatments from their (different) dermatologists. Despite the fact that the women had similar onset dates and lived in the same health district, after further investigation, no link could be established among these cases.

It is very important for improvements on monitoring changes in acute disease incidence and risk factors for infection be used to assess the effectiveness of hepatitis C prevention and control programs. ACDC is in the process of revising our hepatitis epidemiology form. This revised form will serve as a new tool for our district public health nurses to conduct interviews; it is hoped that the information collected will improve the identification of risk groups that can be targeted for the prevention of hepatitis C as well as improving general surveillance for the disease.

**PREVENTION**

Universal blood product screening in 1990 and heat-inactivation of other blood concentrates initiated in 1987 have dramatically reduced recipient-associated cases of hepatitis C. This leaves the reduction of high-risk behaviors as the primary recommendation for preventing transmission; especially, since there is no effective vaccine or post-exposure prophylaxis. Educational efforts aimed at reducing high-risk behaviors (e.g., sharing injection drug equipment, engaging in unprotected sex), may help to reduce new hepatitis C cases. Additional education provided to all of the people who already have hepatitis C is important because alcohol consumption and co-infection with HIV can accelerate the progression of cirrhosis and hepatocellular carcinoma. Patients with chronic hepatitis C should be evaluated for severity of their liver diseases and for possible treatment.

## REFERENCES

1. CDC. Recommendation for prevention and control of hepatitis C virus (HCV) infection and HCV related chronic disease. MMWR 1998; 47:1-39.

## ADDITIONAL RESOURCES

Further information about hepatitis is available from:

- American Liver Foundation – www.liverfoundation.org
- International Liver Foundation – www.hepfi.org/infomenu.htm
- CDC – www.cdc.gov/ncidod/diseases/hepatitis

# HEPATITIS C, ACUTE

| CRUDE DATE | |
|---|---|
| Number of Cases | 5 |
| Annual Incidence<br>LA County<br>California<br>United States | <br>---[a]<br>N/A<br>N/A |
| Case Fatality<br>LA County<br>United States | <br>N/A<br>N/A |

[a] Rates based on fewer than 20 cases are unreliable.

## DESCRIPTION

The Hepatitis C virus (HCV) is the most common bloodborne infection in the US. This RNA virus is predominantly transmitted through contact with contaminated blood and blood products via injection drug use. Sexual and perinatal transmission of HCV appears to occur less frequently. People at risk include: anyone who has had a blood transfusion prior to 1989, IV drug users, hemodialysis patients, infants born to infected mothers, those with multiple sexual partners, health care workers who suffer needle-stick accidents, and people with tattoos or body-piercing. However, an estimated 30% have no identifiable history of exposure to the virus. Household or familial contact is not considered a risk factor for the transmission of hepatitis C. There is no vaccine available for HCV and vaccines for hepatitis A and B do not provide immunity against hepatitis C.

Symptoms of acute infections can include jaundice, fatigue, anorexia, nausea, or vomiting; however, up to 85% of acute infections have mild or no symptoms and usually go undetected. After acute infection, 15%-25% of persons appear to resolve their infection without sequelae as defined by sustained absence of HCV RNA in serum and normalization of ALT levels. Chronic HCV infection develops in most persons (75%-85%) with persistent or fluctuating ALT elevations indicating active liver diseases developing in 60%-70% of chronically infected persons. In the remaining 30%-40% of chronically infected persons, ALT levels are normal. No clinical or epidemiologic features among patients with acute infection have been found to be predictive of either persistent infection or chronic liver disease [1]. Most studies have reported that medical complications occur decades after initial infection including cirrhosis, liver failure, and hepatic cancer.

LAC DHS ACDC uses the CDC/CSTE criteria for acute hepatitis C to standardize surveillance of this infection. The criteria include discrete onset of symptoms and

1. A positive HCV test (antibody test EIA) confirmed by a more specific test (RIBA or detection of the HCV-RNA antigen by polymerase-chain reaction [PCR]) or an EIA signal to cutoff ratio of $\geq$3.8; and
2. Serum alanine aminotransferase (ALT) greater than 7 times the upper limit of normal; and
3. No evidence of either acute hepatitis A or B disease.

The purpose of standardizing surveillance is to allow ACDC to more accurately monitor trends in hepatitis C, compare local data with state and national data, and improve identification of risk groups.

## DISEASE ABSTRACT

- There were five cases of confirmed acute hepatitis C in 2004 which is an increase from 0 confirmed cases in 2003.

## COMMENTS

Of the cases reported in 2004, four were male and one was female. The mean age of acute hepatitis C cases was 58 years; the range was 18-81 years. All cases were White. One hundred and thirty-seven people were initially reported to have acute hepatitis C in 2004, but upon further investigation, only five met the acute hepatitis C surveillance criteria. The increase of acute hepatitis C cases in 2004 was probably due to increased reporting of confirmation tests (RIBA, PCR) rather than a change in the epidemiology of acute cases.

There were limitations to the data collected. The data did not provide enough information for monitoring trends in transmission patterns. The majority of cases denied having risk factors for infection. Since some cases have mild signs and symptoms of hepatitis C in their acute stages, most of the time they may be first identified during the chronic stage. Additional improvements on monitoring changes in acute disease incidence and risk factors for infection can be used to assess the effectiveness of hepatitis C prevention and control programs.

## PREVENTION

Universal blood product screening in 1990 and heat-inactivation of other blood concentrates initiated in 1987 have dramatically reduced recipient-associated cases of hepatitis C. This leaves the reduction of high-risk behaviors as the primary recommendation for preventing transmission; especially, since there is no effective vaccine or post-exposure prophylaxis. Educational efforts aimed at reducing high-risk behaviors (e.g., sharing injection drug equipment, engaging in unprotected sex), may help to reduce new hepatitis C cases. Additional education provided to all of the people who already have hepatitis C is important because alcohol consumption and co-infection with HIV can accelerate the progression of cirrhosis and hepatocellular carcinoma. Patients with chronic hepatitis C should be evaluated for severity of their liver diseases and for possible treatment.

## REFERENCES

1. CDC. Recommendation for prevention and control of hepatitis C virus (HCV) infection and HCV related chronic disease. MMWR 1998; 47:1-39.

## ADDITIONAL RESOURCES

Further information about hepatitis is available from:

- American Liver Foundation – www.liverfoundation.org
- International Liver Foundation – www.hepfi.org/infomenu.htm
- CDC – www.cdc.gov/ncidod/diseases/hepatitis

# HEPATITIS C, ACUTE

| CRUDE DATE | |
|---|---|
| Number of Cases | 0 |
| Annual Incidence<br>LA County<br>California<br>United States | <br>--- [a]<br>N/A<br>N/A |
| Case Fatality<br>LA County<br>United States | <br>N/A<br>N/A |

[a] Rates based on fewer than 20 cases are unreliable.

## DESCRIPTION

The Hepatitis C virus (HCV) is the most common bloodborne infection in the US. This RNA virus of the flavivirus family is predominantly transmitted through contact with contaminated blood and blood products. Sexual and perinatal transmission of HCV appears to occur less frequently. People at risk include: anyone who has had a blood transfusion prior to 1989, IV drug users, hemodialysis patients, infants born to infected mothers, those with multiple sexual partners, health care workers who suffer needle-stick accidents, and people with tattoos or body-piercings. However, an estimated 30% have no identifiable history of exposure to the virus. Household or familial contact is not considered a risk factor for the transmission of hepatitis C. There is no vaccine available for HCV and vaccines for hepatitis A and B do not provide immunity.

Symptoms of acute infections can include jaundice, fatigue, anorexia, nausea, or vomiting; however, up to 85% of acute infections have mild or no symptoms and usually go undetected. Hepatitis C completely resolves in only 15% of infections and progresses to a chronic illness in 60–70%. Medical complications occur decades after initial infection B including cirrhosis, liver failure, and hepatic cancer.

For the purpose of surveillance, LAC uses the CDC/CSTE criteria for acute hepatitis C which include discrete onset of symptoms and

1. A positive HCV test (antibody test EIA) confirmed by a more specific test (RIBA or detection of the HCV-RNA antigen by polymerase-chain reaction [PCR]) or an EIA signal to cutoff ratio of $\geq$3.8; and
2. Serum alanine aminotransferase (ALT) greater than 7 times the upper limit of normal; and
3. No evidence of either acute hepatitis A or B disease.

## DISEASE ABSTRACT

- There were 17 reported acute hepatitis C cases reported in 2003, but upon further investigation no case was confirmed that met the case definition for 2003. Of 9 that had ALT > 7x normal, only one had a confirmatory test (PCR or RIBA).

## PREVENTION

Universal blood product screening in 1990 and heat-inactivation of other blood concentrates initiated in 1987 have dramatically reduced recipient-associated cases of hepatitis C. This leaves the reduction of high-risk behaviors as the primary recommendation for preventing transmission; especially, since there is no effective vaccine or post exposure prophylaxis. Educational efforts aimed at reducing high-risk behaviors (e.g., sharing injection drug equipment, engaging in unprotected sex), may help to reduce new hepatitis C cases.

## COMMENTS

Surveillance for acute hepatitis C aims to monitor ongoing transmission of HCV and conduct investigations of these cases to determine their characteristics and risk factors. This provides the best information for monitoring trends in transmission patterns. The collection of risk factor information is useful for characterizing groups at risk of infection and targeting prevention activities. Monitoring changes in acute disease incidence and in the risk factors for infection can be used to assess the effectiveness of hepatitis C prevention and control programs.

No cases of acute hepatitis C were confirmed in 2003. The decrease in acute hepatitis cases may be attributable to the adherence by LAC DHS to the stringent CDC/CSTE for acute hepatitis C. Many of the cases lacked a laboratory test (RIBA or PCR) that is necessary to confirm a case of hepatitis C. Therefore, increasing health care providers or laboratories about the importance of using the extra laboratory tests awareness may help to improve surveillance for acute hepatitis C.

## ADDITIONAL RESOURCES

Further information about hepatitis is available from:

- American Liver Foundation – www.liverfoundation.org
- International Liver Foundation – www.hepfi.org/infomenu.htm
- CDC – www.cdc.gov/ncidod/disases/hepatitis/

# HEPATITIS C, ACUTE

| CRUDE DATA | |
|---|---|
| Number of Cases | 2 |
| Annual Incidence | |
| LA County | -- [a] |
| California | N/A |
| United States | N/A |
| Case Fatality | |
| LA County | N/A |
| United States | N/A |

[a] Rates based on fewer than 20 cases are unreliable.

## DESCRIPTION

The Hepatitis C virus (HCV) is the most common bloodborne infection in the US. This RNA virus is one of at least 5 different viruses associated with liver disease and is predominantly transmitted through contact with contaminated blood and blood products. Sexual and perinatal transmission of HCV appears to occur less frequently, but its epidemiology has yet to be fully elucidated. People at risk include: anyone who has had a blood transfusion prior to 1989, IV drug users, hemodialysis patients, infants born to infected mothers, those with multiple sexual partners, health care workers who suffer needle-stick accidents and people with tattoos or body-piercings. However, an estimated 30% have no identifiable history of exposure to the virus. Household or familial contact is not considered a risk factor for the transmission of hepatitis C. There is no vaccine available for HCV and vaccines for hepatitis A and B do not provide immunity.

Symptoms of acute infections can include jaundice, fatigue, anorexia, nausea, or vomiting; however, up to 85% of acute infections have mild or no symptoms and usually go undetected. Hepatitis C completely resolves in only 15% of infections and progresses to a chronic illness in 60–70%. Medical complications occur decades after initial infection B including cirrhosis, liver failure, and hepatic cancer. Once infection has occurred, secondary prevention recommendations include: vaccination for hepatitis A and B viruses, abstaining from alcoholic beverages, avoiding other high-risk behaviors (e.g., unprotected sex) and maintaining regular doctors visits for assessment and early treatment.

In the US, the annual number of acute hepatitis C virus infections has declined during the past decade from 180,000 to 35,000. Primary prevention efforts concentrate mainly on risk-behavior modification—specifically, avoiding contact with contaminated blood. An estimated 3.9 million Americans are currently infected with HCV, and an estimated 8,000–10,000 deaths each year result from HCV-associated chronic liver disease. HCV infection affects persons of all ages, but most acute cases of hepatitis C and the highest seroprevalence of HCV infection are found among young, male adults. The highest proportion both of incident cases and of prevalent infections is among White males.

The current CDC definition for acute hepatitis C requires that a person have evidence of jaundice or an onset date of symptoms within six months of diagnosis and have the following laboratory results:

1. A positive HCV test (antibody testBEIA) confirmed by a more specific test (RIBABor detection of the HCV-RNA antigen by polymerase-chain reaction) or an EIA signal to cutoff ratio of $\geq$3.8.
2. Serum alanine aminotransferase (ALT) greater than 7 times the upper limit of normal.
3. No evidence of either acute hepatitis A or B disease.

## DISEASE ABSTRACT

- There were 13 reported cases of acute hepatitis C in 2002, but upon further investigation only two cases were confirmed and met the current case definition.
- The two acute cases were in a 29 year-old Latino and a 51 year-old Asian. The first case had been incarcerated and the second case reported tattooing in the six months prior to infection. These were the only identified risk factors. No common surgical procedure or interventions were identified prior to clinical presentation. Both denied use of needles for injection of street drugs.
- A total of 9,691 HCV chronic cases were reported in 2002, 15% fewer than 2001 (N=11,379).

## PREVENTION

Universal blood product screening in 1990 and heat-inactivation of other blood concentrates initiated in 1987 have dramatically reduced recipient-associated cases of hepatitis C. This leaves the reduction of high-risk behaviors as the primary recommendation for preventing transmission. Educational efforts aimed at reducing high-risk behaviors (e.g., sharing injection drug equipment, engaging in unprotected sex), may help to reduce new hepatitis C cases. Testing should be offered routinely to persons most likely to be infected with HCV who might require medical management, and testing should be accompanied by appropriate counseling and medical follow-up. Once chronic infection has occurred, consuming alcohol and becoming co-infected with HIV or other hepatitis A or B viruses can accelerate the progression of hepatitis C disease to cirrhosis, liver failure, and hepatocellular carcinoma. Additional funding is necessary to study the feasibility of hepatitis B vaccine into existing programs that provide drug/alcohol treatment as well as HIV screening and treatment.

## COMMENTS

Conducting surveillance for acute hepatitis C is difficult—stringent criteria are established by the CDC and are required for diagnosis. With more widespread use of HCV testing, increasingly larger numbers of persons with a positive anti-HCV (antibody to HCV) test are being reported to state and local health departments. Most of these reports represent chronic disease from past drug use or blood transfusions. Because there is no serologic marker for acute hepatitis C, additional investigation is required to determine if these reports represent acute infection, chronic infection, a duplicate report (i.e., resulting from a repeated test of a person previously reported), or a false-positive.

Such stringent criteria explain why it is hard to classify the reported HCV cases—most of the anti-HCV reports are not accompanied by results of the other laboratory tests and resources are not available to conduct a follow-up on every reported case. Only cases reported with additional laboratory information are investigated; therefore, the number of acute hepatitis C cases is an underestimation of the total number of cases. Furthermore, there has been a recent change in the ALT levels necessary to be considered a case. Since 2000, the serum ALT levels have been raised from 2.5 times the upper limit of normal (ALT >120U/L) to 7 times the upper limit of normal (ALT >280 U/L). This standard has decreased the number of cases. ACDC is currently exploring methods to improve surveillance for hepatitis C in order to identify more acute cases and better understand the epidemiology of acute hepatitis C in LAC.

Therapy for hepatitis C is a rapidly changing area of clinical practice. Combination therapy with interferon and ribavirin is now FDA-approved treatment for chronic hepatitis. These recombinant interferon drugs have been effective in 40%–50% of those treated. Side effects include: flu-like symptoms, depression, headache and decreased appetite and are usually very severe. No data exist indicating that treatment begun during the acute phase of infection is more effective than treatment begun early during the course of chronic HCV infection.

The most important areas for future research include developing less toxic treatments and finding better ways to identify those who are infected. New studies, including evaluations of the latest combination treatment in patients who haven't responded to other treatments or who had to stop those treatments due to side effects, still need to be conducted.

## ADDITIONAL RESOURCES

Further information about hepatitis is available from:

American Liver Foundation – www.liverfoundation.org

International Liver Foundation – www.hepfi.org/infomenu.htm

CDC – www.cdc.gov/ncidod/disases/hepatitis/

## HEPATITIS C, ACUTE

| CRUDE DATA | |
|---|---|
| Number of Cases | 1 |
| Annual Incidence | |
| LA County | N/A[a] |
| United States | 1.4 |
| Age at Diagnosis | |
| Mean | N/A[b] |
| Median | N/A[b] |
| Range | N/A[b] |
| Case Fatality | |
| LA County | 0.0% |
| United States | N/A |

[a]Rates based on less than 20 observations are unreliable.
[b]Not available.

### DESCRIPTION

The Hepatitis C virus (HCV) is the most common blood-borne infection in the US. This RNA virus is one of at least 5 different viruses associated with liver disease that is predominantly transmitted through contact with contaminated blood and blood products. Sexual and perinatal transmission of HCV appears to occur less frequently, but its epidemiology has yet to be fully elucidated. People at risk include anyone who has had a blood transfusion prior to 1989, IV drug users, hemodialysis patients, infants born to infected mothers, those with multiple sexual partners, health care workers who suffer needle-stick accidents and people with tattoos or body-piercings. However, an estimated 30% have no identifiable history of exposure to the virus and household/familial contact is not considered a risk factor for the transmission of hepatitis C. There is no vaccine available for HCV and vaccines for hepatitis A and B do not provide immunity against hepatitis C.

### DISEASE ABSTRACT

- 11,379 HCV chronic cases were reported in 2001.
- This is a 7.5% increase from 10,044 cases reported in 2000.
- Only 1 case was confirmed as acute hepatitis C out of 26 in depth investigations.
- The acute case occurred in a 25 year-old white who had a surgical procedure in the 6 months before onset of symptoms; no blood products were involved.

### COMMENTS

In the US, the annual estimated number of acute HCV infections has declined during the past decade from 180,000 to 35,000. Primary prevention efforts concentrate mainly on risk-behavior

modification - specifically, avoiding contact with contaminated blood. An estimated 3.9 million Americans are currently infected with HCV, and an estimated 8,000-10,000 deaths each year result from HCV-associated chronic liver disease. HCV infection affects persons of all ages, but most acute cases of hepatitis C and the highest seroprevalence of HCV infection are found among young, male adults. The highest proportion both of incident cases and of prevalent infections is among whites.

Conducting surveillance for acute hepatitis C is difficult. There are stringent criteria set forth by the CDC and the CSTE which are required in order to be diagnosed with acute hepatitis C. It is important to differentiate acute hepatitis C from chronic cases because public health can learn about current patterns of transmission and acquisition of hepatitis C only from acute cases. With more widespread use of HCV testing increasingly larger numbers of persons with a positive anti-HCV (antibody to HCV) test are being reported to state and local health departments. Most of these reports represent chronic disease from past drug use or blood transfusions. Because there is no serologic marker for acute hepatitis C, additional investigation is required to determine if these reports represent acute infection, chronic infection, repeated testing of a person previously reported, or a false-positive result.

The current CDC/CSTE definition for acute hepatitis C requires that a person have evidence of jaundice or an onset date of symptoms within six months of diagnosis and have the following laboratory results:

- A positive anti-HCV test confirmed by a more specific test (RIBA or RNA by polymerase chain reaction) or an EIA signal to cutoff ratio of $\geq$3.8;
- Serum alanine aminotransferase (ALT) greater than 7 times the upper limit of normal;
- No evidence of either acute hepatitis A or B disease.

Such stringent criteria explain why it is hard to classify the HCV cases reported to LAC DHS as acute hepatitis C; most of the anti-HCV reports are not accompanied by results of the other laboratory tests. LAC DHS does not have the resources to follow-up on every case of anti-HCV reported. Only those cases that are reported with additional laboratory information are investigated; therefore the count of acute hepatitis C cases are an underestimate of the actual number of acute hepatitis C cases in LAC. Furthermore, there has been a recent change in the ALT levels necessary to be considered as an acute HCV case. Since 2000, the serum ALT levels have been raised from 2.5 times the upper limit of normal (ALT>120U/L) to 7 times the upper limit of normal (ALT >280 U/L). Thus the number of acute hepatitis C cases decreased from 10 in 2000 to 1 in 2001. LAC DHS is exploring ways to improve surveillance for hepatitis C in order to identify more acute cases and better understand the epidemiology of acute hepatitis C in LAC.

Universal blood product screening in 1990 and heat-inactivation of other blood concentrates since 1987 have dramatically reduced recipient-associated cases of hepatitis C. This action leaves reduction of high-risk behaviors as the chief further means to prevent transmission. Education aimed at reducing high-risk behaviors for hepatitis B and HIV transmission B such as sharing injection drug equipment B should have additional benefit in reducing hepatitis C cases. Testing should be offered routinely to persons most likely to be infected with HCV who might require medical management, and testing should be accompanied by appropriate counseling and medical follow-up. Once chronic infection has occurred, consuming alcohol and becoming co-infected with HIV or other hepatitis A or B viruses can accelerate the progression of hepatitis C disease to cirrhosis, liver failure, and hepatocellular carcinoma. Additional funding is

necessary to study the feasibility of hepatitis B vaccine into existing programs that provide drug/alcohol treatment as well as HIV screening and treatment.

The most important areas for future research include developing less toxic treatments and finding better ways to identify those who are infected. New studies, including evaluations of the newest combination treatment in patients who haven't responded to other treatments or who had to stop those treatments due to side effects still need to be conducted.

## ADDITIONAL RESOURCES

American Liver Foundation website: www.liverfoundation.org/

International Liver Foundation website: www.hepfi.org/

CDC website: www.cdc.gov/ncidod/diseases/hepatitis/

Information regarding the rules, regulations and control of hepatitis C within LAC is available from the Acute Communicable Disease Control website at:
www.lapublichealth.org/acd/procs/b73/b73index.htm

# HEPATITIS C, ACUTE

| CRUDE DATA | |
|---|---|
| Number of Cases | 7 |
| Annual Incidence | |
| LA County | 0.08[a] |
| California[b] | 0.16 |
| United States[b] | 0.57 |
| Age at Diagnosis | |
| Mean | 35 |
| Median | 30 |
| Range | 20-52 years |

[a]Rates calculated based on less than 19 cases or events are considered unreliable.
[b]Calculated from Final 2012 Reports of Nationally NotifiableInfectious Disease. MMWR 62(33);669-682.

## DESCRIPTION

The Hepatitis C virus (HCV) is a RNA-virus primarily transmitted though percutaneous exposure to infectious blood. Traditional risk factors include: injection drug use (IDU), receipt of a blood transfusion prior to 1992, needle-stick injuries in healthcare settings, birth to infected mothers, having multiple sexual partners, tattoos or body-piercing and hemodialysis. The presence of HIV infection is associated with increased risk of infection among men engaging in certain sexual practices with other men. Household or familial contact does not appear to increase the risk of transmission of hepatitis C. An estimated 30% of cases have no identifiable exposure risk. Healthcare related transmission has been documented and should be considered in persons without identified traditional risk factors for hepatitis C. HCV is the most common chronic bloodborne infection in the US.

The average incubation period is 4-12 weeks (range: 2-24 weeks). Up to 85% of persons with newly acquired HCV infection are asymptomatic but when symptoms occur they can include: fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, clay-colored bowel movements, joint pain, and jaundice. After acute infection, 15%-25% of persons appear to resolve their infection, while chronic infection develops in 75%-85% of persons. Most studies have reported that medical complications occur decades after initial infection including cirrhosis, liver failure, and hepatic cancer.

Primary prevention activities are recommended for prevention and control of HCV infection including; screening and testing of blood donors and persons born during 1945 through 1965, viral inactivation of plasma-derived products, risk-reduction counseling and screening of persons at risk for HCV infection, and routine practice of injection safety in healthcare settings. There is no vaccine or post-exposure prophylaxis for HCV and vaccines for hepatitis A and B do not provide immunity against hepatitis C.

For the purpose of surveillance, Los Angeles County Department of Public Health uses the 2012 Centers for Disease Control (CDC)/Council of State and Territorial Epidemiologists (CSTE) criteria for acute hepatitis C: 1) discrete onset of symptoms and 2) jaundice or alanine aminotransferase (ALT) levels > 400IU/L, and 3) (a) anti-HCV screening test positive with signal to cut-off ratio predictive of true positive or (b) HCV RIBA positive or (c) Nucleic Acid Test (NAT) for HCV RNA positive 4) no evidence of either acute hepatitis A or B disease.

In 2012, the CDC/CSTE acute hepatitis C case definition also included documented seroconversion cases as acute hepatitis C cases (documented negative HCV test result within 6 months prior to HCV diagnosis).

## 2012 TRENDS AND HIGHLIGHTS

- Of the seven confirmed acute hepatitis C cases for 2012, two cases were documented seroconversions and the remainder of the cases met the 2012 CDC/CSTE acute hepatitis C case criteria.
- The majority of cases were in the 15-34 year age group (n=4, 57%) (Figure 2).
- The majority of cases were Hispanic (n=3, 43%), there were no Asian cases (Figure 3).
- The male to female ratio was 1:0.4.
- Risk factors were identified in 100% (n=7) of the confirmed cases interviewed. Receiving a tattoo (n=3 [2 in prison, 1 in home], 43%), IDU (n=3, 43%) and incarceration (n=3, 43%) were the most common risk factors reported, followed by using street drugs but not injecting (n=2, 29%), exposure to someone's blood (n=2, 29%), contact with a suspected case (n=2, 29%), receiving a diagnostic medical procedure (n=2, 29%), IV/IM injection (n=2,

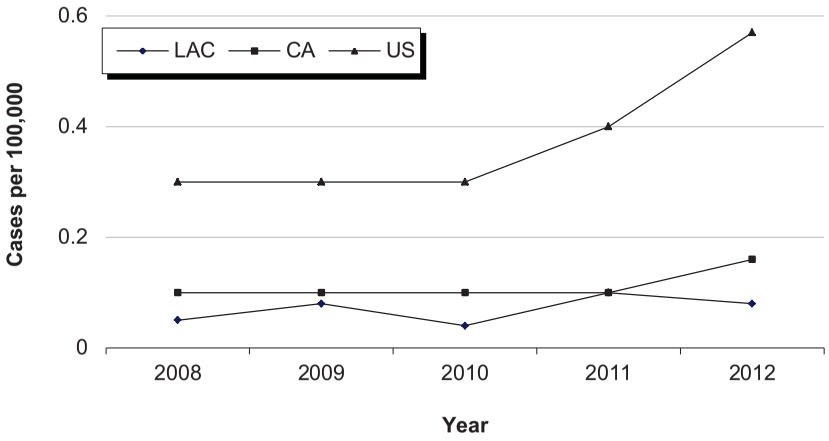
29%), and transfusion (n=2, 29%); and one case each was identified with an accidental needle stick (n=1, 14%), body piercing (n=1, 14%), and having multiple sexual partners (n=1, 14%)
(Figure 4).

## Reported Hepatitis C, Acute Cases and Rates* per 100,000 by Age Group, Race/Ethnicity, and SPA
## Los Angeles County, 2008-2012

| | 2008 (N=5) | | | 2009 (N=8) | | | 2010 (N=4) | | | 2011 (N=10) | | | 2012 (N=7) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 | No. | (%) | Rate/ 100,000 |
| **Age Group** | | | | | | | | | | | | | | | |
| <1 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0 | |
| 1-4 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0 | |
| 5-14 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0 | |
| 15-34 | 1 | 20.0 | | 1 | 12.5 | | 1 | 25.0 | | 4 | 40.0 | 0.1 | 4 | 57.1 | 0.1 |
| 35-44 | 1 | 20.0 | | 2 | 25.0 | | 2 | 50.0 | | 2 | 20.0 | 0.1 | 1 | 14.3 | 0.1 |
| 45-54 | 2 | 40.0 | | 3 | 37.5 | | 1 | 25.0 | | 1 | 10.0 | 0.1 | 2 | 28.6 | 0.2 |
| 55-64 | 0 | 0.0 | | 1 | 12.5 | | 0 | 0.0 | | 1 | 10.0 | 0.1 | 0 | 0 | |
| 65+ | 1 | 20.0 | | 1 | 12.5 | | 0 | 0.0 | | 2 | 20.0 | 0.2 | 0 | 0 | |
| Unknown | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | | | | 0 | 0 | |
| **Race/Ethnicity** | | | | | | | | | | | | | | | |
| Asian | 1 | 20.0 | | 1 | 12.5 | | 0 | 0.0 | | 1 | 10.0 | 0.1 | 0 | 0 | 0 |
| Black | 0 | 0.0 | | 0 | 0 | | 0 | 0.0 | | 0 | 0.0 | 0.0 | 1 | 14.3 | 0.1 |
| Hispanic | 1 | 20.0 | | 1 | 12.5 | | 1 | 25.0 | | 6 | 60.0 | 0.1 | 3 | 42.9 | 0.1 |
| White | 3 | 60.0 | | 6 | 75.0 | | 3 | 75.0 | | 2 | 20.0 | 0.1 | 2 | 28.6 | 0.1 |
| Other | 0 | 0.0 | | 0 | 0 | | 0 | 0.0 | | 0 | 0.0 | 0.0 | 1 | 14.3 | |
| Unknown | 0 | | | 0 | | | 0 | 0.0 | | 1 | 10.0 | | 0 | 0 | 0 |
| **SPA** | | | | | | | | | | | | | | | |
| 1 | | 0.0 | | 1 | 12.5 | | 0 | 0.0 | | 0 | 0.0 | 0.0 | 2 | 28.6 | 0.5 |
| 2 | 3 | 60.0 | | 0 | 0.0 | | 3 | 75.0 | | 1 | 10.0 | 0.0 | 1 | 14.3 | 0.0 |
| 3 | 1 | 20.0 | | 0 | 0.0 | | 0 | 0.0 | | 2 | 20.0 | 0.1 | 0 | 0 | 0 |
| 4 | 0 | 0.0 | | 2 | 25.0 | | 0 | 0.0 | | 3 | 30.0 | 0.2 | 1 | 14.3 | 0.1 |
| 5 | 0 | 0.0 | | 2 | 25.0 | | 0 | 0.0 | | 1 | 10.0 | 0.2 | 1 | 14.3 | 0.2 |
| 6 | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | | 0 | 0.0 | 0.0 | 1 | 14.3 | 0.1 |
| 7 | 0 | 0.0 | | 1 | 12.5 | | 0 | 0.0 | | 2 | 20.0 | 0.1 | 0 | 0 | 0 |
| 8 | 1 | 20.0 | | 2 | 25.0 | | 1 | 25.0 | | 1 | 10.0 | 0.1 | 1 | 14.3 | 0.1 |
| Unknown | 0 | 0.0 | | 0 | 0.0 | | | | | 0 | 0.0 | 0.0 | 0 | 0 | |

*Rates calculated based on less than 19 cases or events are considered unreliable.

**Figure 1. Incidence Rates* of Acute Hepatitis C LAC, CA and US, 2008-2012**




*Rates based on fewer than 19 cases are unreliable

**Figure 2. Cases of Acute Hepatitis C by Age Group LAC, 2010-2012**

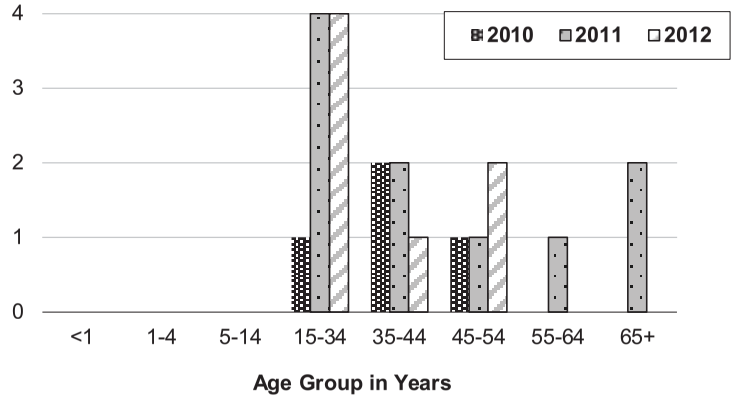
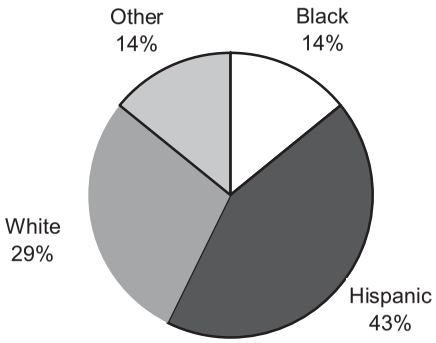



**Figure 3. Percent Cases of Acute Hepatitis C by Race/Ethnicity LAC, 2012 (N=7)**



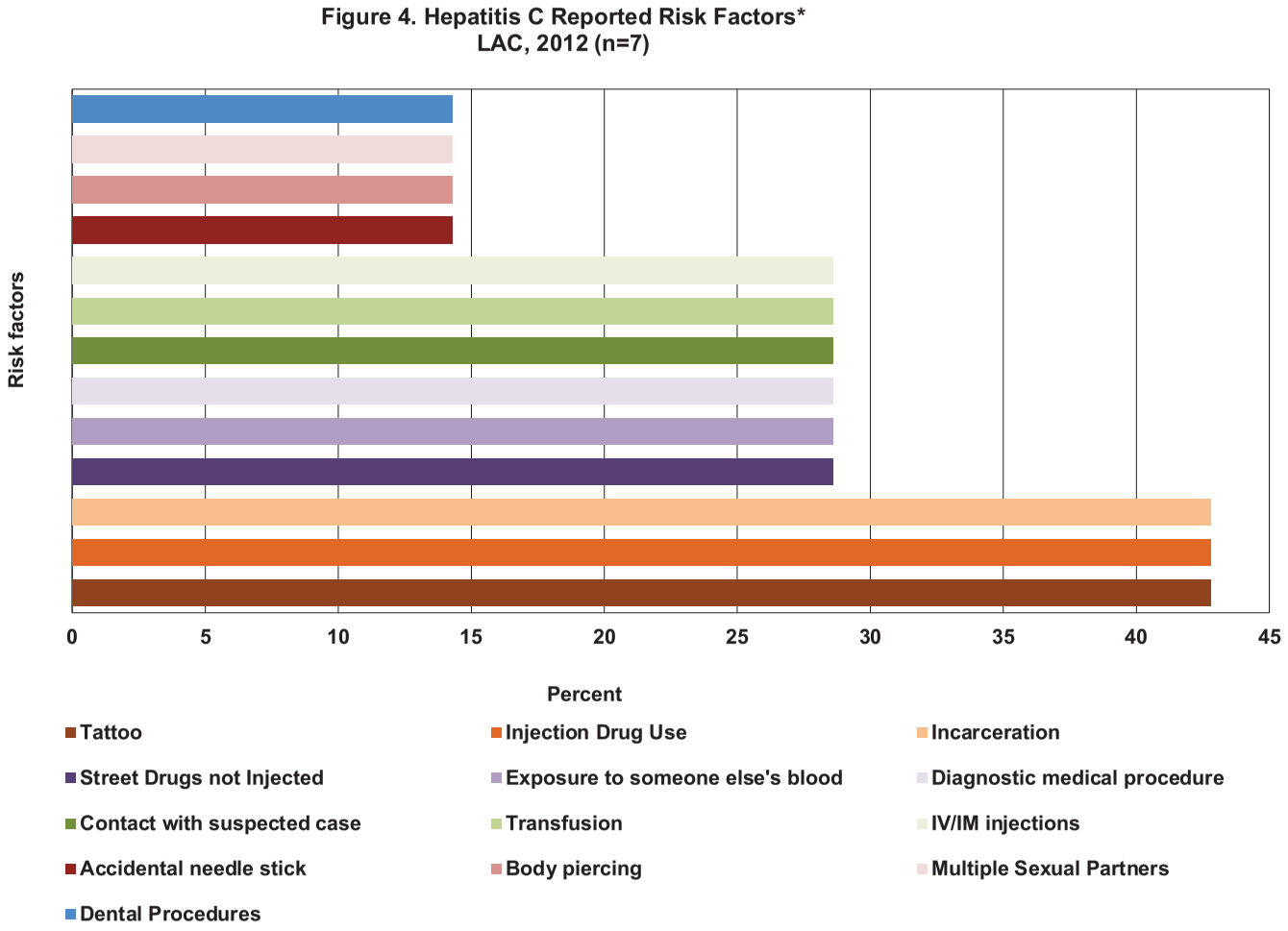


Figure 4. Hepatitis C Reported Risk Factors*
LAC, 2012 (n=7)
Risk factors
0
5
10
15
20
25
30
35
40
45
Percent
Tattoo
Injection Drug Use
Incarceration
Street Drugs not Injected
Exposure to someone else's blood
Diagnostic medical procedure
Contact with suspected case
Transfusion
IV/IM injections
Accidental needle stick
Body piercing
Multiple Sexual Partners
Dental Procedures