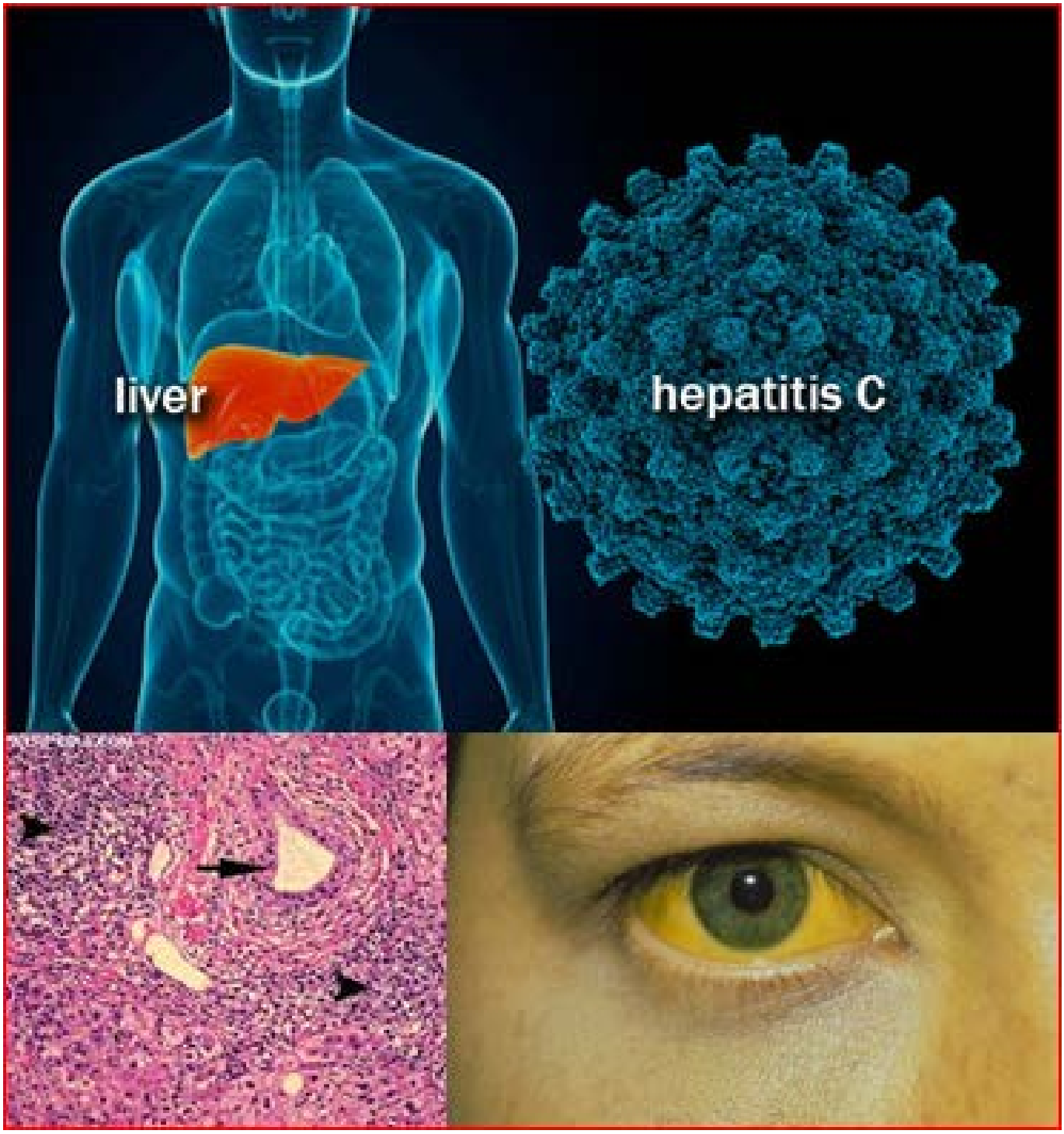
Epidemiologic Profile of Hepatitis C Virus Infection in Louisiana – 2015



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Contributors and Funding Source

Louisiana Department of Health and Hospitals
Office of Public Health
Infectious Disease Epidemiology Section

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Executive Summary

This epidemiologic profile provides information about the trends and distribution of hepatitis C (HCV) infection in Louisiana (LA). This information will be used by the LA Department of Health, community health stakeholders, local jurisdictions and others to plan and implement a comprehensive HCV prevention and control programs. Surveillance data for HCV has been collected since 1990 The LA Viral Hepatitis Prevention Program was initiated 2001 by the LA Office of Public Health, Infectious Disease Epidemiology department (IDEpi). The VHP program receives HCV case reports from various sources and maintains the LA Hepatitis Register. As of December 2014 the LA Hepatitis Register had 79,000 records. Although an estimated 250 to 500 people are infected with HCV each year in LA, the majorities of new infections are asymptomatic and therefore remain undiagnosed and unreported.

The current status of HCV in LA is similar to the rest of the US. The majority of cases are found in adults. The highest incidence rates for both males and females are seen in the age group between 45 to 54 years. In all age groups, incidence is higher among males than females. The racial distribution shows the same pattern as that observed for gender distribution in age distribution. The highest incidence of acute HCV is seen in African-American males between the ages of 45 and 54 years. The age group distribution of HCV-Past or Present Infection has a pattern similar to that of acute HCV. Low rates are seen in the early years reaching a peak among adults and decreasing among the elderly and are higher in males compared to females. The geographical distribution of HCV in LA shows higher rates in urban areas. Overall, Orleans Parish has the highest prevalence.

Hospital admission and discharge data also provides useful information regarding HCV and co-morbidities in LA. There were 87,122 admit diagnoses documented for patients hospitalized with HCV between 1999 and 2014. The most common reasons for admission were mental conditions (including drug dependency or poisoning, alcohol abuse, bipolar disease, depression, psychosis, and other psychiatric conditions). The most common discharge diagnosis was related to HCV (either chronic HCV infection or HCV infection), followed by mental conditions (including alcohol and drug use, and psychiatric conditions), other infectious diseases, and circulatory diseases.

Death records are collected and analyzed to determine the most common causes of death among those infected with HCV. The most common cause of death in those infected with HCV is related to liver disease, including cirrhosis, liver cancer, and portal hypertension. Mental conditions and poisoning were among the other leading causes of death in those with HCV.

An important risk factor for HCV is injection drug use. Opioid-related deaths in LA have significantly increased in recent years. Although exact statistics for the rate of HCV among IDU in LA are not available, it is estimated that 51.5% of people who inject drugs in New Orleans are HCV positive.

The HIV/HCV co-infection rate in LA is the 5th highest in the nation, with an estimated 6% of HCV cases are co-infected with HIV/AIDS. Eighteen percent of cases known to have been infected with HIV via injection drug use are co-infected with HCV.

1-Goals & Objectives

The objectives of the viral hepatitis epidemiologic profile developed by the Infectious Disease Epidemiology Section of the Louisiana Office of Public Health are to:

1. Describe the burden of HCV infection in LA
2. Describe trends in incidence and provenance of HCV across different populations
3. Describe current state programs dealing with HCV
4. Summarize HCV related hospitalizations and comorbidities
5. Summarize major risk factors associated with HCV
6. Discuss resources for the community and healthcare providers dealing with HCV in LA
7. Serve as an educational resource for HCV in LA

2-LA Socio-Demographic Characteristics

To study any health condition whether it is infection, illness, risk factors, access to treatment, public health resources it is important to understand the demographic, social and cultural human situation as well as the physical environment.

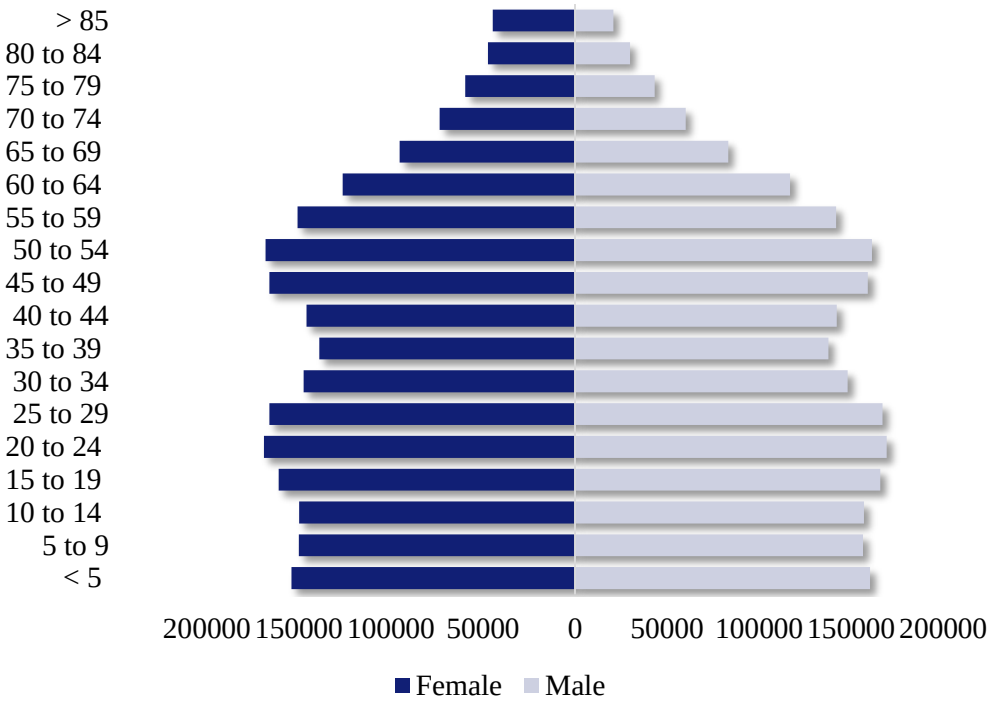
2.1-Population

The population of LA is approximately 4,650,000 according to the 2014 estimate by the US Census Bureau. In the past decade there were large fluctuations in the LA population as a result of Hurricane Katrina. From the year 2000 (population 4,470,000), the population increased at a rate of 0.3% per year. In 2005, the mid-year population before Hurricane Katrina was 4,530,000. After Hurricane Katrina in 2006, the population dropped to 4,280,000, a 5.6% decline. In 2008 the population began increasing rapidly at a rate of approximately 1 to 2% per year until 2012, when the growth rate returned 0.3% per year. These fluctuations in the population were also accompanied by changes in the distribution of the population by sex, age, racial and ethnic groups. Thus the yearly rates per population groups are not as precise as one would expect.

2.2-Age and Racial Distribution

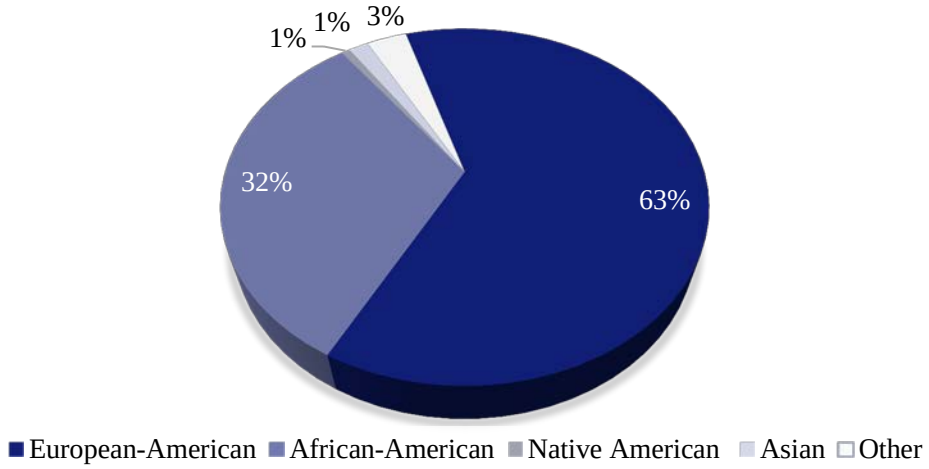
Females represent 51% of the population and males 49%. The age group distribution is similar to the rest of the US with a slice of 300,000 to 325,000 per 5 year age groups from birth to age 50-54 then a gradual decrease by about 50,000 per slice of 5 years. The 0 to 1 age group comprise 66,000, the 85 and above 65,700.

Figure 2.2.1: Age and Sex Distribution- LA, 2010



Most racial or ethnic groups are now described by their geographical area of origin (examples: African-Americans, Asians, Pacific Islanders, and Native Americans). To be consistent with this categorization the term "European-Americans" is used rather than Caucasian.. The majority of the population is represented by European-American (63%) and African-American (32%) racial groups. Asians, Native Americans and Pacific Islanders and "other" groups make up the remainder of the population (5%).

Figure 2.2.1: Racial Distribution- LA, 2010



According to the 2000 census, people of Hispanic origin made up 2.4% of the state's population in the 2000 census, an estimated 4% of the state's population in 2005, and 5.6% in the 2010

census. The state has attracted an influx of immigrants from various countries of Latin America, including Mexico, Cuba, Honduras, Nicaragua and the Dominican Republic. The New Orleans metro area has the third largest Honduran-American community in the US.

2.3-Native American Tribes of LA

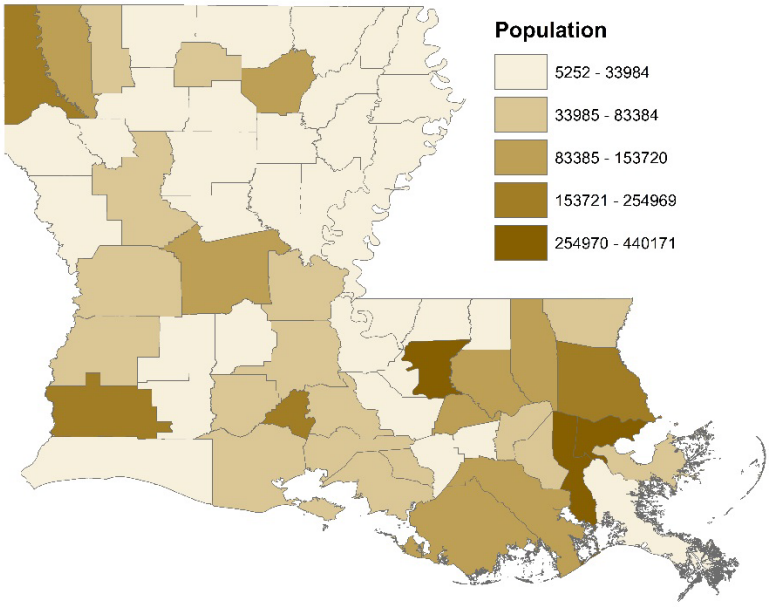
The census estimates are that approximately 26,000 Native Americans live in LA. The federal government recognizes four tribes in LA: the Chitimacha tribe in the Houma Thibodaux region, the Tunica-Biloxi tribe and the Jena band of Choctaw Indians in the Alexandria region and the Coushatta tribe in the Lake Charles area. The state recognizes ten additional tribes: The united Houma Nation, Coctaw-Apache of Ebarb, Clifton-Choctaw, Adai-Caddo, Four Winds, Louisiana Choctaw, Grand Caillou/Dulac Band, Isle de Jean Charles, Pointe aux Chenes Indian, and Biloxi-Chitimacha Confederation of Muskogees. Historically, some Native American tribes of Louisiana farmed cotton, corn and vegetables on small plots of land or raised livestock. Others took jobs in the timber and oil industries or make and sell traditional crafts and baskets. The practice of hunting, fishing, trapping, shrimping and oystering was common.

2.4-Geographical Distribution of the Population

Louisiana is divided into 64 parishes (from the French word *paroisses*) which are the equivalent of counties in the other US states. Forty-one parishes are governed by a council called the Police Jury. The other 23 parishes have various forms of government, including: president-council, council-manager, parish commission, and consolidated parish/city.

2.4.1-Population by Parish (2010 Census)

Figure 2.4.1: Population by Parish- LA, 2010



2.4.1-Cultural Regions

North Louisiana

The northern region (also called the "Sportsman's Paradise") has more in common with the neighboring states of Mississippi, Alabama, and Georgia than with South Louisiana. A cultural anthropologist uses the term "Upland South" to describe this region. Early settlers came from other southern states. The heritage of the people of this region is Anglo-Saxon or Celtic, meaning their ancestors were English, Scottish, or Irish.

The Shreveport-Bossier City-Minden Metropolitan Statistical Area at the northwest corner of the state is the major urban area of the region. Four counties and two major cities make up the region. Although separated by the Red River and parish lines, these two cities blend together into one urban culture. In northeast Louisiana, the urban center is Monroe-West Monroe. These cities are joined by a bridge across the Ouachita River, and both are in Ouachita Parish. The University of Louisiana at Monroe provides a cultural focus for the community.

Central Louisiana

Also known as the "Crossroads" covers the center of the state and merges the cultures of North and South Louisiana. The urban center is Alexandria-Pineville. Like Shreveport and Bossier City, these cities are on the banks of the Red River. Both are in Rapides Parish. In this region, small towns like Cheneyville and Winnfield feature Main Street stores and churches. In the rural areas, some people still live on farms and continue their traditions. Weathered old barns symbolize these rural roots.

Acadiana

Also known as "Cajun Country" spreads over the southwest corner of Louisiana. Within this region, the culture can be further divided into *prairie Cajun* and *wetlands*. On the prairie, the Cajun culture was centered on agriculture and livestock. The wetland Cajuns were fishers and trappers. Much of this lifestyle is continued today throughout the region. New economic interests, such as the oil industry, have brought cultural changes and now provide employment for many of the regions inhabitants. Urban centers in Acadiana include Houma, Lafayette, Morgan City, and Thibodaux. Lake Charles is also included in the Cajun Country region but shares some cultural characteristics with neighboring Texas. English is the common language, but many locals still speak Cajun French. Although American fast-food restaurants are now common in these cities, the rich Cajun food is still common.

Plantation Country

The region centered around Baton Rouge is considered separate from Acadiana. Old plantation homes, live oak trees, and Spanish moss are the common symbols of this region. Life reaches from the past toward the future in this area along the Mississippi River. As its name suggests, this region has more plantation homes than any other place in the South. Today, people have begun to look for the cultural heritage of all who live in the region, not just the heritage of those who lived in the big house on the plantation. The face of the region represents the conflicts of that past and the struggle for a better tomorrow. Baton Rouge is the urban center of this region. The state's capital city has a mix of people and lifestyles represented by all ethnic groups living in Louisiana today.

Greater New Orleans (GNO) Area

This region harbors the largest concentration of population with the city/parish of Orleans, the Parish of St. Bernard and Plaquemine, the western "suburb" in Jefferson Parish and the suburban areas north of the Lake Pontchartrain. It is often described as "cosmopolitan," an American city that is more like a European one. A busy port on the Mississippi River exists alongside the exotic historic district of The French Quarter. New Orleans is the largest city in the state, and is sometimes described as having more in common with the Caribbean and South America than with the rest of the US.

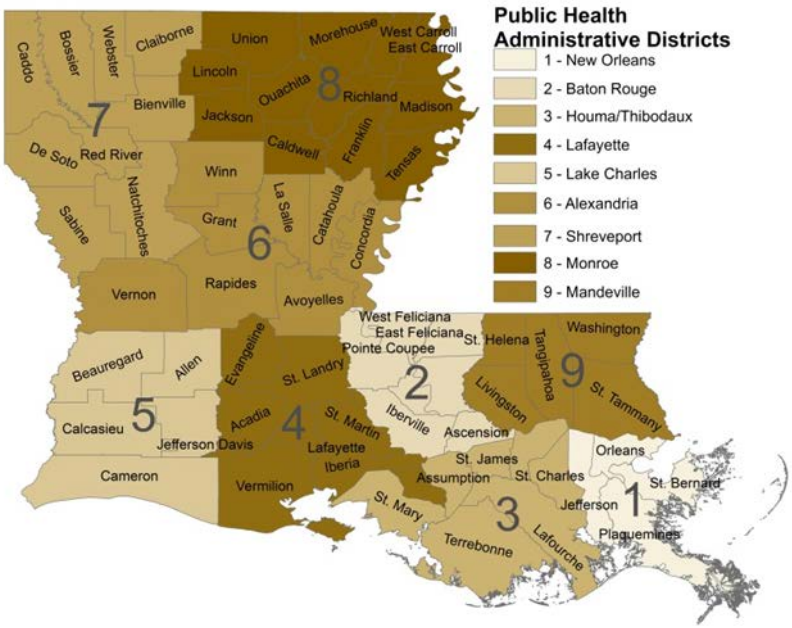
Florida Parishes

Located in the "the toe of the boot" area of the state, this region was once part of the colony of West Florida, and makes up a large portion of Plantation Country and the Greater New Orleans area. This region was settled by people more culturally comparable to those in northern Louisiana than those of the GNO and Acadiana regions.

Figure 2.4.2: Cultural Regions of Louisiana

2.4.2-Administrative Regions

For public health purposes the state was divided in 9 Administrative Regions centered on one of the large cities:



2.5-Socio-economic aspects (2010 Census)

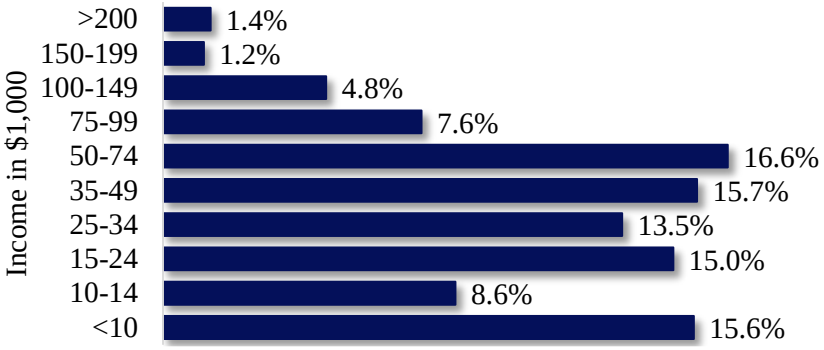
2.5.1-Employment

Of the population of 3,400,000 aged 16 and above, there is a labor force of 2,016,000 persons (59.4%). Of those, 1,998,000 are employed (58.9%) and 146,000 are unemployed (4.3%). The number of persons not counted in the labor force is 1,378,000 persons (40.6%). Private wage and salary workers constitute the majority of workers (75%), with the remaining represented by government employees (17%) and self-employed in non-incorporated businesses (6%).

2.5.2-Household income

The median household income is $32,466. The distribution of household income is distributed as presented in the figure. Among families with children under age five, 26.7% have family income below the federal poverty level. For families with a female head of household, no husband, and children under the age of five, 60.7% have income below the federal poverty level.

Figure 2.5.1: Household Income- LA, 2010



2.5.3-Education

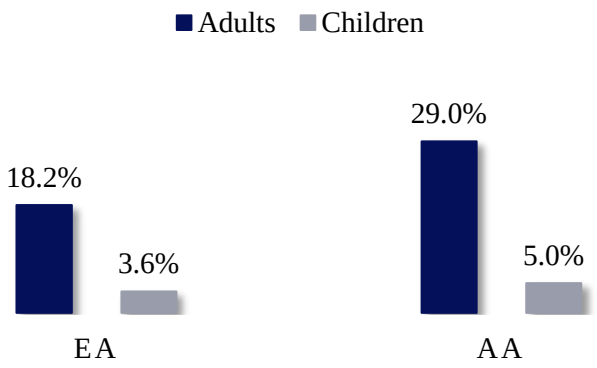
In Louisiana, 18% of adults have not graduated from high school, 34% have a high school diploma or equivalent, 28% have some college education, and 19% have a college degree. Statewide, over 50% of adults have had no college education.

2.6-Health Insurance Coverage

In 2013, the overall proportion of uninsured adults under 65 years old was 22.0%, with variations by age group. There is a higher proportion of uninsured in the younger age groups: 29.7% for 19 to 25 year olds compared to 15.7% of those aged 55 to 64. Adults with a lower education are also less likely to be insured: 42.6% of those with only some high school education are uninsured, 27.5% of high school graduates, and 21.1% of those with some college education, 10.9% of college graduates, and 5.7% for those with a graduate degree).

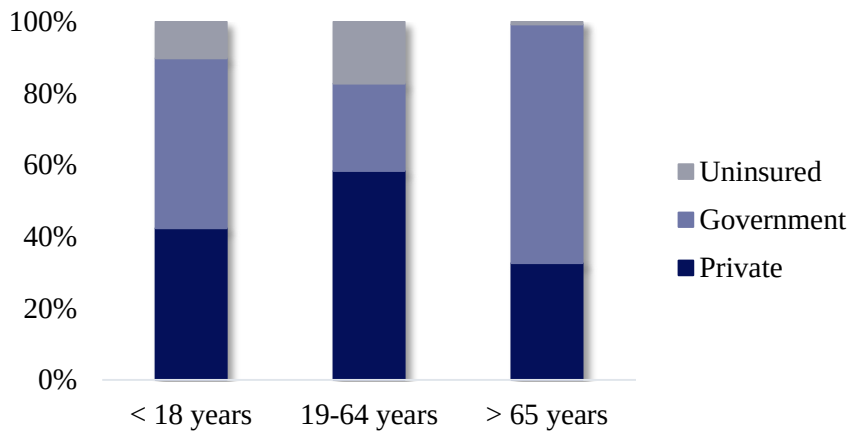
There is a large discrepancy between African-Americans (29.0% uninsured among adults, 5.0% uninsured among children) and European-Americans (18.2% uninsured among adults and 3.6% uninsured among children).

Figure 2.6.1: Total Uninsured in European-Americans vs African-Americans- LA, 2013



Nearly 95% of children under 18 years are more likely to be insured, which can be attributed to Medicaid/LaCHIP programs. Children under five have a slightly lower uninsured rate (3.6%), compared to those over five (4.6%). Parent/guardian insurance (41.7%) and Medicaid (47.3%) are the primary sources of coverage for children; the remaining children are covered by privately purchased insurance (4.1%) or other sources (2.5%).

Figure 2.6.1: Health Insurance Coverage Type by Age Group- LA, 2013



3-Epidemiologic Surveillance Infrastructure and Methods

The LA Office of Public Health, Infectious Disease Epidemiology Section (IDEpi) has maintained a Viral Hepatitis Prevention Program (VHP) since 2001. Surveillance for viral hepatitis is needed to direct and evaluate prevention and control activities. In LA epidemiologic surveillance has been a main component of this program throughout the years. The IDEpi department employs a variety of different tools to maintain detailed information regarding HCV in the state of LA.

The main source of data for HCV is the LA HCV Registry, which combines reports from four different systems to maintain an accurate record of cases. Other sources of data provide useful information regarding the complications, comorbidities, health behaviors, and risk factors. These include the Behavioral Risk Factor Surveillance Survey (BRFSS), the LA Early Event Detection System (LEEDS), and the LA Tumor Registry (LTR). Analysis of data from the HCV registry and other sources provides insight to the disease burden of HCV in LA.

The HCV register has been used to provide reliable data on HCV burden throughout the years:

- In 2005 an article presenting the burden of HCV in Louisiana was published in the Journal of the Louisiana State Medical Society (Sokol TM, Lewis BE, Straif-Bourgeois S, Talati G, Ratard RC. Hepatitis C in Louisiana. *Journal of the Louisiana State Medical* Society. 2005 (157) 98-102).
- In 2013, data registry matches were conducted between the LA Enhanced HIV/AIDS Reporting System and the LA Hepatitis Registry to characterize HIV/HCV co-infection rates in LA. The match included all HIV and HCV cases reported to the state of LA between 2002 and 2012. An epidemiological analysis of HIV/HCV co-infection in LA

from 2002 to 2012 was conducted and findings of the analysis were presented at the 2014 American Public Health Association (APHA) Annual Conference.

- Annual summaries obtained from the surveillance data is made available to the public.

3.1-HCV Registry

Since 1990, IDEpi has continuously maintained a state-level HCV Registry. The registry currently includes 89,000 cases, registered since 1990. The registry uses the following data sources to identify cases:

- **Infectious Disease Reporting Information System (IDRIS)**: Receives reportable disease surveillance data manually entered by health care providers remotely through web-based system
- **Electronic laboratory reports (ELR):** Receives HCV laboratory reports from laboratory facilities throughout the LA.
- **LA Hospital Inpatient Discharge Database (LaHIDD)**: Hospital inpatient discharge data received through the, which contains hospital discharge data submitted by facilities throughout the state
- **State Center for Health Statistics (SCHS):** Provides mortality data from death certificates with HCV mentioned as a primary cause of death or a contributing factor

3.2-IDRIS: IDEpi's reportable disease data collection tool

The IDEpi department has a robust infectious disease surveillance data collection system that has evolved from an EpiInfo ® system, to an Access® program and recently to a proprietary web based system. Currently, the IDRIS2, an adaptation of CDC's NBS system which was customized to meet the IDEpi department's surveillance needs, is utilized.

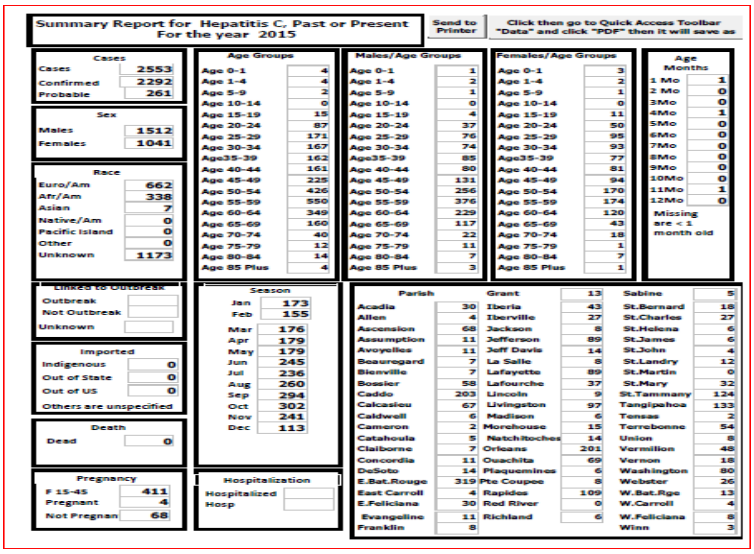
The IDRIS2 is designed to allow remote reporting of infectious diseases and other reportable conditions (as mandated the by LA Sanitary Code) by health care providers using a secure web access. The IDEpi department relies on laboratory reports for viral hepatitis surveillance. Reports are remotely entered directly into IDRIS2 by health care providers, imported directly into IDRIS2 from ELR, converted from ELR to paper copies for manual entry into IDRIS2, or can be mailed or faxed to IDEpi by health care providers and reference labs and manually entered into IDRIS2. IDE is currently in the process of enabling direct import of all ELR into IDRIS2.

The system has a simple two screen data entry interface allowing easy data entry (basic demographic and contact information, basic medical information on the condition being reported). The medical information screen captures laboratory data needed for classification of the condition according to CDC case classification guidelines.

Furthermore, IDRIS2 incorporates supplemental Case Investigation Forms. Many reportable conditions require a public health intervention, such as collection of additional data for epidemiologic purposes or collection of data on the preventive actions implemented. This additional information can be documented in the case investigations section. Case investigations

forms have been created for existing reportable conditions. If the need arises, case investigation forms may be created quickly.

Figure 3.2.1: Snapshot example of summary report that can easily be produced in IDRS
(*The purpose is not to present detailed data*)



Summary Report for Hepatitis C, Past or Present
For the year 2015

Send to Printer | Click then go to Quick Access Toolbar "Data" and click "PDF" then it will save as

Cases	
Cases	2553
Confirmed	2292
Probable	261

Sex	
Males	1512
Females	1041

Race	
Euro/Am	662
Afr/Am	338
Asian	7
Native/Am	0
Pacific Island	0
Other	0
Unknown	1173

Linked to Outbreak	
Outbreak	
Not Outbreak	
Unknown	

Imported	
Indigenous	0
Out of State	0
Out of US	0
Others are unspecified	

Death	
Dead	0

Pregnancy	
F 15-45	411
Pregnant	4
Not Pregnan	68

Age Groups	
Age 0-1	4
Age 1-4	4
Age 5-9	2
Age 10-14	0
Age 15-19	15
Age 20-24	87
Age 25-29	171
Age 30-34	167
Age35-39	162
Age 40-44	161
Age 45-49	225
Age 50-54	426
Age 55-59	550
Age 60-64	349
Age 65-69	160
Age 70-74	40
Age 75-79	12
Age 80-84	14
Age 85 Plus	4

Males/Age Groups	
Age 0-1	1
Age 1-4	2
Age 5-9	1
Age 10-14	0
Age 15-19	4
Age 20-24	37
Age 25-29	76
Age 30-34	74
Age35-39	85
Age 40-44	80
Age 45-49	131
Age 50-54	256
Age 55-59	376
Age 60-64	229
Age 65-69	117
Age 70-74	22
Age 75-79	11
Age 80-84	7
Age 85 Plus	3

Females/Age Groups	
Age 0-1	3
Age 1-4	2
Age 5-9	1
Age 10-14	0
Age 15-19	11
Age 20-24	50
Age 25-29	95
Age 30-34	93
Age35-39	77
Age 40-44	81
Age 45-49	94
Age 50-54	170
Age 55-59	174
Age 60-64	120
Age 65-69	43
Age 70-74	18
Age 75-79	1
Age 80-84	7
Age 85 Plus	1

Age Months	
1 Mo	1
2 Mo	0
3Mo	0
4Mo	1
5Mo	0
6Mo	0
7Mo	0
8Mo	0
9Mo	0
10Mo	0
11Mo	1
12Mo	0

Missing are < 1 month old

Season	
Jan	173
Feb	155
Mar	176
Apr	179
May	179
Jun	245
Jul	236
Aug	260
Sep	294
Oct	302
Nov	241
Dec	113

Hospitalization	
Hospitalized	
Hosp	

Parish		Grant	13	Sabine	5
Acadia	30	Iberia	43	St.Bernard	18
Allen	4	Iberville	27	St.Charles	27
Ascension	68	Jackson	8	St.Helena	6
Assumption	11	Jefferson	89	St.James	6
Avoyelles	11	Jeff Davis	14	St.John	4
Beauregard	7	La Salle	8	St.Landry	12
Bienville	7	Lafayette	89	St.Martin	0
Bossier	58	Lafourche	37	St.Mary	32
Caddo	203	Lincoln	9	St.Tammany	124
Calcasieu	67	Livingston	97	Tangipahoa	133
Caldwell	6	Madison	6	Tensas	2
Cameron	2	Morehouse	15	Terrebonne	54
Catahoula	5	Natchitoches	14	Union	8
Claiborne	7	Orleans	201	Vermilion	48
Concordia	11	Ouachita	69	Vernon	18
DeSoto	14	Plaquemines	6	Washington	80
E.Bat.Rouge	319	Pte Coupee	8	Webster	26
East Carroll	4	Rapides	109	W.Bat.Rge	13
E.Feliciana	30	Red River	0	W.Carroll	4
Evangeline	11	Richland	6	W.Feliciana	8
Franklin	8			Winn	3

3.3-LA Inpatient Hospital Discharge Data (LaHIDD)

Hospitalization surveillance is based on LaHIDD. In 1997, the LA Legislature mandated the reporting of hospital discharge data. The LaHIDD system contains a registry of all hospital discharge data in the state. The data cannot be used for real-time surveillance, due to a several-month delay in processing, but is useful for retrospective surveillance. The LaHIDD data sets contain demographic information including: names, gender, age, date of birth, address, admit diagnosis, discharge diagnoses (main diagnosis and eight additional diagnoses), procedures (main procedure, and an additional five), charges, length of stay and hospital name. The diagnoses and procedures are coded using ICD-9 codes.
Repeat hospitalizations are not included. Records of patients with HCV were extracted using the following ICD-9 codes whether in the main diagnosis or in the eight additional secondary diagnoses:

Code	Disease
07041	Other specified viral hepatitis with hepatic coma, hepatitis C
07051	Other specified viral hepatitis without mention of hepatic coma, hepatitis C
07044	Chronic hepatitis C with hepatic coma
07054	Chronic hepatitis without hepatic coma
07070	Hepatitis C without hepatic coma (Not otherwise specified)
07071	Hepatitis C with hepatic coma (Not otherwise specified)
v0262	Hepatitis C carrier

The total number of hospitalizations from 1999 to 2014 ranged from 467,000 to 608,000 (mean of 543,000). The numbers are increasing by 2,400 each year. The number of hospitalization

reported in LaHIDD is consistent with estimates derived from the National Center for Health Statistics (NCHS Report #5, 7/30/2008, 2006 National Hospital Discharge Survey). In this report the rate of hospitalizations for the Southern USA is 1,212 hospitalizations /10,000 population per year. This would amount to 545,400 hospitalizations in LA, which is a close approximation to the number reported in the 2006 LaHIDD data.

3.4-Mortality data from the State Center for Health Statistics (SCHS)

The SCHS is operated by the Center for Population Health Informatics and the Office of the State Registrar and Vital Records. The SCHS maintains records for births, deaths, fetal deaths, marriage, divorce, and induced termination of pregnancies in LA. Death certificates are required to be submitted within five days of death by the funeral director. Cause of death is recorded on the death certificate by the medical professional or coroner using national ICD-10 codes. Although state law mandates that identities be kept confidential for a period of 50 years after death, the data can be used for determining epidemiological trends among age groups, geographical location, race, gender and cause of death. The majority of deaths in LA reported from 1999 to 2014 are represented by eight conditions (heart disease, cancer, chronic lower respiratory diseases, accidents, stroke, Alzheimer's disease, Diabetes and influenza/pneumonia). Mortality data is used by public health professionals, research, health providers, and government organizations to direct resources and implement prevention programs where most needed.

3.5-LA Behavioral Risk Factor Surveillance Survey (BRFSS)

The BRFSS is a state-based system of health surveys that collect information on health risk behaviors (including cigarette and alcohol use), preventive health practices, and health care access primarily related to chronic disease and injury. Data for the BRFSS is collected annually through state-wide telephone (landline and cellular) surveys of the civilian, non-institutionalized adult population aged 18 or older. It is sponsored by the CDC. In 2013, the BRFSS collected data from all 50 States, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam using a computer-assisted telephone interviewing (CATI) design. Approximately 500,000 adults are interviewed each year, and state estimates are presented annually.

3.6-LA Early Event Detection System (LEEDS)

The LEEDS contains data submitted electronically from emergency departments of 62 hospitals throughout the state. The data is automatically categorized by chief complaint data, admit reason, and diagnosis, which can be used to identify specific syndromes. Data collected from LEEDS has been used to describe the emergency department visits indicative of drug use. One of the syndromes tracked in LEEDS is drug use related to heroin and opioids.

3.7-LA Tumor Registry (LTR)

The LTR contains state cancer surveillance data since 1974. It is managed by the LA State University Health Sciences Center in New Orleans and receives funding from the state and the CDC. In 2001, after a competitive application process, the LA Tumor Registry was selected to join the SEER Program of the National Cancer Institute as an expansion registry on a provisional

basis. Four years later, it became a full member of SEER. As such, the LTR again receives additional funds from the NCI. The operations of the registry are mandated by public law, R.S. 40:1299.80 et seq., which directs all medical facilities and health care providers to report all cancer cases to the registry. The statewide population-based registry provides data that is used for the calculation of cancer incidence, statistics by age, race, sex, geographic region, and trends over time.

3.8-LA Annual Surveillance Reports

Louisiana publishes an annual update of the reportable infectious disease conditions, including the HCV surveillance report. These reports provided a useful starting point for the enhanced LA Viral Hepatitis C Epidemiologic Profile.

These Disease Surveillance Reports are available online at:

http://dhh.louisiana.gov/assets/oph/Center-PHCH/Center-CH/infectious-epi/Annuals/HepC_LaIDAnnual.pdf

3.9-Surveillance definitions

Hepatitis C is categorized as a Class C disease and must be reported to the state of LA within five business days of diagnosis. There are two types of reportable cases of HCV infections.

1. **Acute Hepatitis C:** includes newly infected individuals who are symptomatic and have elevated liver enzymes as an indicator of recent infection.

2. **Hepatitis C past or present infection:** includes cases with serologic tests indicating HCV infection which newly reported to the Office of Public Health, without possibility of determination of date of infection. (This reporting category was added in 2003.)

3.9.1-Acute Hepatitis C

Case classification:
Confirmed: meets the clinical case definition and is laboratory confirmed.
Probable: meets clinical case definition, antiHCV EIA positive, but the anti-HCV EIA result has not been verified by an additional more specific assay or the signal to cut-off ratio is unknown.

Clinical Case Definition:
An acute illness with:

- Discrete onset of symptoms consistent with acute viral hepatitis, and
- Jaundice or elevated serum aminotransferase levels

Laboratory criteria

- Elevated liver enzymes: serum alanine aminotransferase levels >7 times the upper limit of normal, **AND**
- IgM anti-HAV negative (if done), **AND**
- IgM anti-HBc negative , or if not done, HBsAg negative **AND**
- Anti-HCV positive (repeat reactive) by EIA, verified by an additional more specific assay (e.g. RIBA™ for anti-HCV or nucleic acid testing for HCV RNA) **OR**
- Anti-HCV positive (repeat reactive) by screening immunoassay with a signal to cut-off ratio predictive of a true positive as determined for the particular assay (e.g., ≥3.8 for enzyme immunoassay).

Up to 10% of cases of acute HCV will be anti-HCV negative when tested initially because some have not yet seroconverted and others (<3%) remain negative even with prolonged follow-up. Available serologic tests for anti-HCV do not distinguish between acute and chronic or past infection. Thus, other causes of acute hepatitis should be excluded for anti-HCV positive patients who have an acute illness compatible with hepatitis. The diagnosis of HCV infection can be made by detecting HCV RNA using gene amplification techniques (e.g. RT-PCR). However, a negative HCV RNA test result does not exclude the possibility of HCV infection.

Case Ascertainment:
The primary method to ascertain suspected cases of acute HCV is by follow-up of reported clinical cases of HCV and non-A, non-B hepatitis.
This includes:

- Serologic testing of patients with signs/symptoms of acute viral hepatitis, according to an appropriate algorithm.
- Repeat anti-HCV testing, or testing for HCV RNA by RT-PCR, of persons with suspected acute viral hepatitis who test negative for IgM anti-HAV, IgM anti-HBc, and anti-HCV at the time the case is reported.

Laboratory reporting of anti-HCV positive results is encouraged as a method to identify persons with HCV infection. However, most HCV-infected persons who are identified on the basis of anti-HCV positive laboratory reports have chronic, rather than acute, infections. Thus, the investigation of these reports is not likely to be an efficient mechanism to identify acute Hepatitis C cases unless additional clinical information is obtained with the serologic result. Routine reporting of ALT levels with anti-HCV positive laboratory results might be useful to identify persons who are most likely to have acute disease, and would enhance the usefulness of laboratory reporting in conducting surveillance for acute HCV.

3.9.2- Past or present HCV infection (HCV-PP1)

Case Classification:
Confirmed: laboratory confirmation
Probable: Anti-HCV EIA positive EIA and elevated ALT
Suspect: AntiHCV EIA positive only

Clinical Case Definition:
Most HCV-infected persons are asymptomatic. However, many have chronic liver disease, which can range from mild to severe including cirrhosis, and liver cancer.

Laboratory criteria:

- Anti-HCV positive (repeat reactive) by EIA, verified by an additional more specific assay (e.g. RIBA for anti-HCV or nucleic acid testing for HCV RNA) **OR**
- Anti-HCV positive (repeat reactive) by EIA with signal to cut-off ratio ≥3.8.

Case Ascertainment:
The primary method to ascertain cases of HCV infection is by reporting of all anti-HCV positive laboratory results to state and/or local health departments.

3.9.3-Incidence

Incidence is the number of new cases of infection or illness occurring during a specific period of time in a given population at risk of acquiring the infection or developing the illness. Incidence of HCV infection cannot be accurately measured by reporting systems since a large proportion of new infection are asymptomatic and not diagnosed as they occur. Incidence of illness is also difficult to evaluate since the illness will develop progressively over a period of years. Incidence can also be described as the rate, using the number of cases in 100,000 people of the population (cases per 100,000 population).

3.9.4-Prevalence

Prevalence is the number of persons living with an infection at a given time. Several types of prevalence may be considered: prevalence of persons infected with the HCV virus, prevalence of persons infected with HCV virus presenting no overt sign of illness (asymptomatic individuals), prevalence of HCV illness (symptomatic cases), and prevalence of chronic illness (such as liver cirrhosis). Evaluating the prevalence of HCV infections using reportable disease surveillance systems results in underreporting of the prevalence in the population because of the large number of cases that have not been diagnosed. Prevalence of infection can best be evaluated using a survey of a population group but this method is expensive and seldom used except for the national surveys conducted by CDC using laboratory testing results.

3.9.5-Newly reported cases

These are new HCV infection diagnoses that are reported to LDHH. These diagnoses are based on laboratory tests. The test date does not reflect the actual date the infection was acquired.

4-HCV Infection Surveillance Results

4.1- National HCV estimates

Surveillance data from the Third National Health and Nutrition Examination Survey conducted during 1988-1994 indicated that there were an estimated 3.9 million people in the United States who have been infected with HCV. The US incidence rate of HCV infection peaked in 1992, at 2.4 per 100,000 population (cases confirmed and reported). From 1992 to 2009, the incidence rate declined by 88% (0.3 per 100,000 population). The decline was most dramatic among

persons aged 30 to39 years (92%; from 5.8 per 100,000 population to 0.5 per 100,000 population, respectively). After accounting for asymptomatic, undetected, and unreported infections, it was estimated that there were an estimated 16,000 new infections in the United States per year. Using this data, estimates were calculated for the total number of people living with HCV in LA.

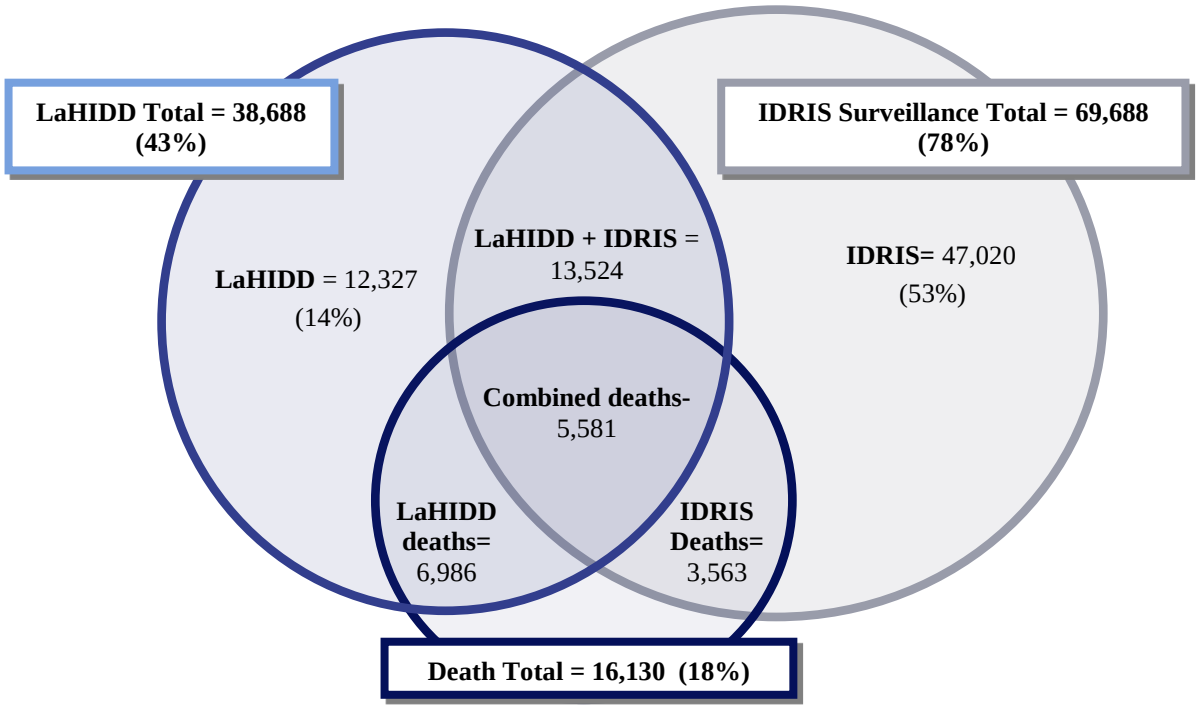
According to the CDC, there are 60,000 people with HCV infection currently living in LA, or 1.3% of the population. An estimated 250 to 500 people acquire HCV each year (5.3 per 100,000 population). Of which 85% will develop chronic hepatitis and 17% will progress to cirrhosis, a disease which has a 25% fatality rate. Annually, 150 LA residents are expected to die from HCV related causes. Approximately 3,000 (5%) of infected individuals are candidates for a liver transplant, which costs at least $300,000 for a non-eventful, uncomplicated procedure.

4.2-Hepatitis Registry

There are currently a total of 89,001 cases recorded in the HCV registry. The majority of records were entered through the IDRIS (78.3%), while LAHIDD produced only 43.2%, and death certificate records accounted for the remaining 18.1%.

For records with slight discrepancies, manual examination of the data is necessary to determine if the record is a duplicate. Duplicate reports can be identified by assessing last name, first name, date of birth and social security number, when available. The IDRIS produces the largest number of unique records that are not in the other sources (people who are reported by surveillance but were neither in the hospital nor in the mortality records). The second most common source of unique records is LAHIDD. It is noteworthy that the mortality records did not produce a single record that was either in the surveillance nor LAHIDD. It is probable that there are cases of HCV infected individuals that died of causes not related to HCV and therefore are not recorded in the mortality records.

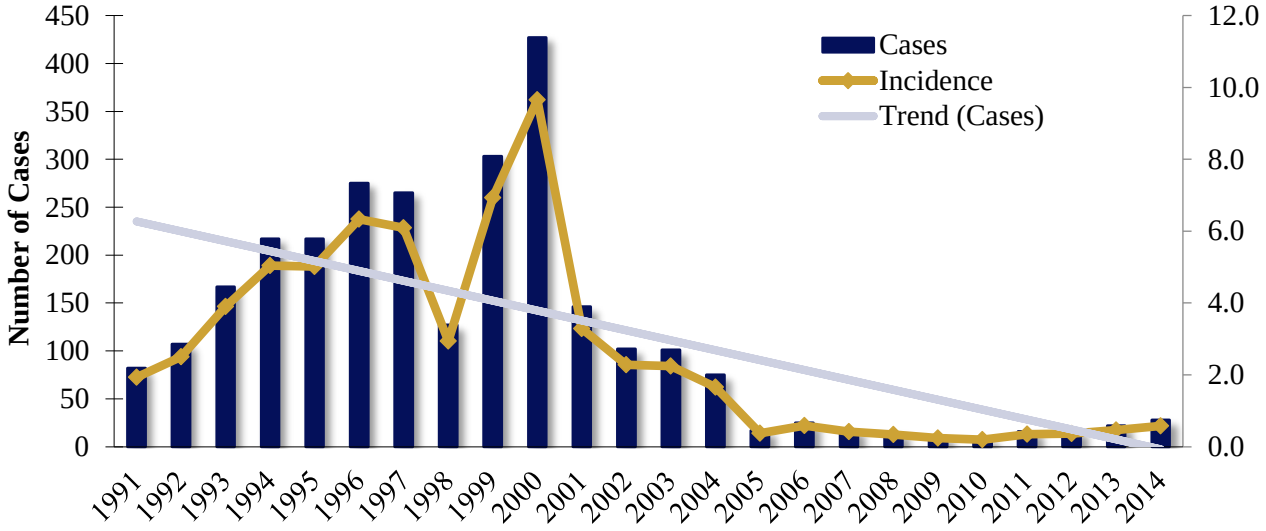
Figure 4.4.1: Distribution of Cases in Register According to Source- LA, 2014



4.3-Acute HCV

Although an estimated 250 to 500 people are infected with HCV each year in LA, the majority of new infections are asymptomatic and therefore remain undiagnosed and unreported. In the past, the number of new cases reported per year ranged from 100 to 400. During the 1990's there was a steady increase of reported "acute" HCV cases. This increase was probably due to increased awareness and screening of HCV by medical care providers. The number of acute HCV infections reported each year declined from 2000 to 2010. The drastic decrease in cases from 2000 to 2001 is due to a change in the case definition for acute HCV. In 2001, the case definition was changed to reflect an increase in the level of liver enzymes that qualify. This change excluded a large number people from qualify for and acute HCV case. The incidence rate began increasing again in 2010.

Figure 4.3.1: Acute HCV cases and incidence rates - LA, 1991-2014

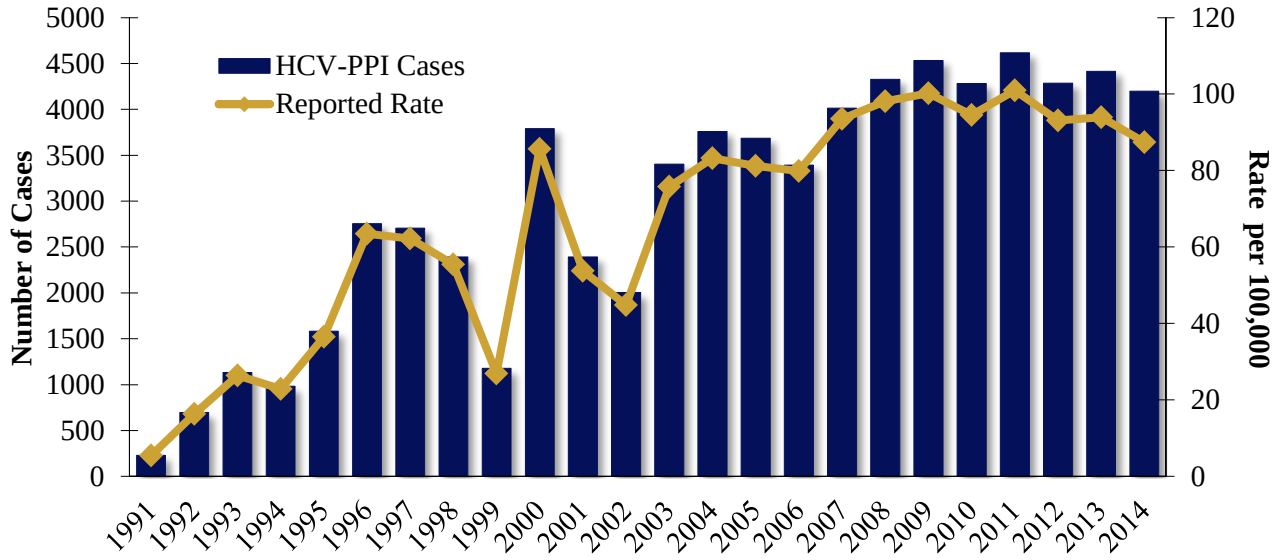


Hepatitis C is rare among children; case rates increase after 19 years of age. The highest incidence rates for both males and females are seen in the 45 to 54 year-old age group. In all age groups, incidence is higher among males than females. The race distribution shows the same pattern as that observed for gender distribution. The highest incidence of acute HCV is seen in African-American males between the ages of 45 and 54 years.

4.4-HCV Past or Present Infection

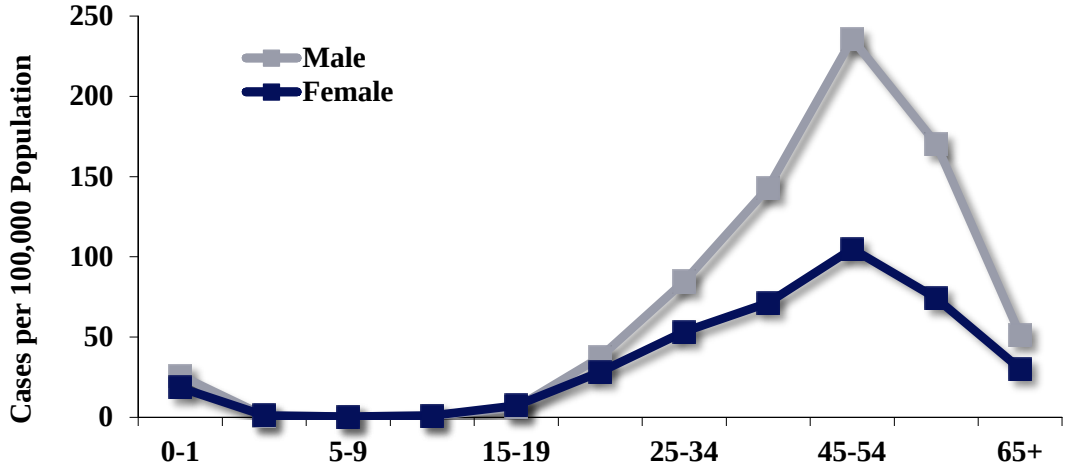
The reporting category of "HCV past of present infection" (HCV-PPI) was established in 2003. Prior to 2003, all cases of HCV were entered into the hepatitis register as acute HCV. The number of cases entered in the HCV register throughout the years shows some deep troughs. This is most likely due to surveillance artifacts. Overall, the prevalence of HCV is increasing in LA.

Figure 4.4.1: Reported cases of HCV-PPI - LA, 1991-2014



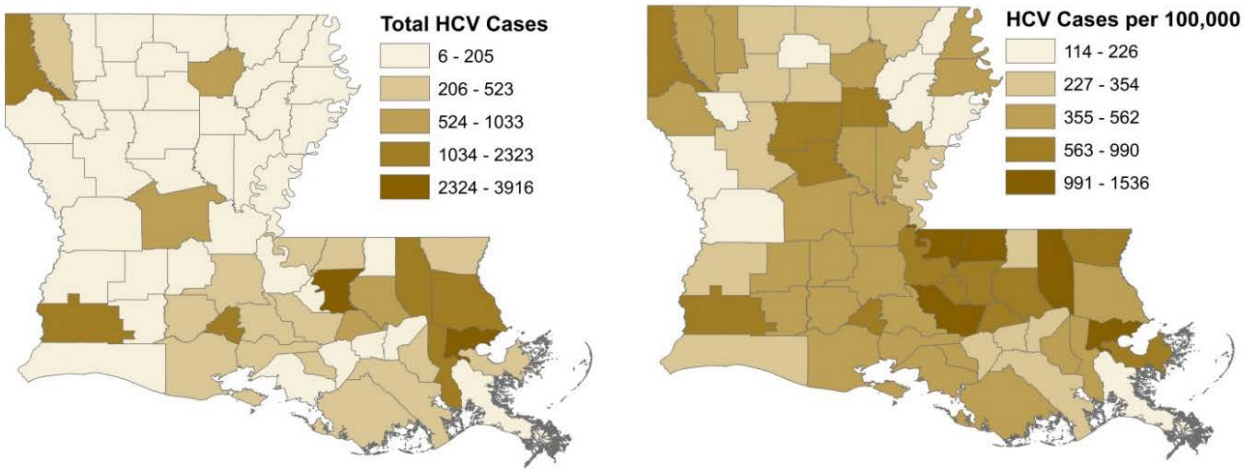
The age group distribution of HCV-PPI has a pattern similar to that of acute HCV. Low rates are seen in the early years reaching a peak among adults and decreasing among the elderly and are higher in males compared to females (Figure 4.6.2).

Figure 4.4.2: HCV-PPI age group distribution - LA, 1991-2014



The geographical distribution of HCV in LA shows higher rates in urban areas (greater New Orleans, Baton Rouge, and Lafayette). Orleans Parish has the highest prevalence. It is important to mention that some rural parishes have a high prevalence when population differences are accounted for, despite the actual number of cases being low. This is demonstrated in the following graphics.

Figure 4.4.3: HCV Prevalence by Parish- LA, 2015

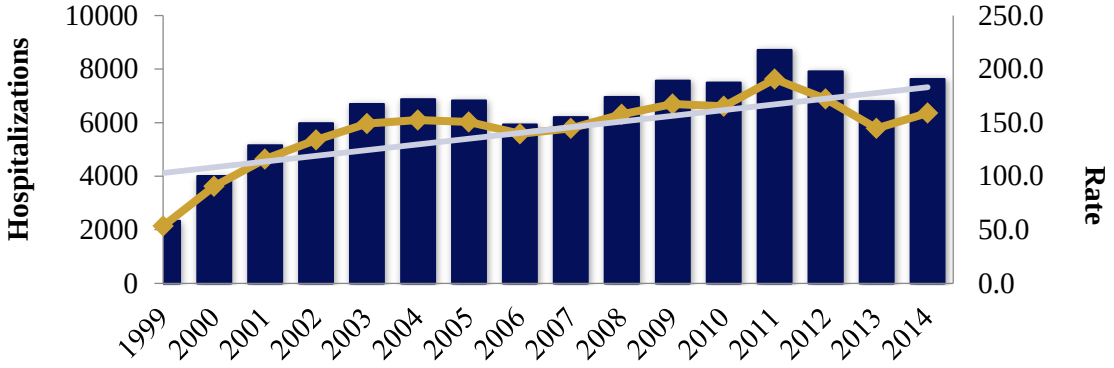


4.5-Hospitalization Surveillance

4.5.1-Hospitalization Numbers, Rates and Trends

The number of hospitalizations related to HCV increased progressively from 2,337 in 1999 to 7,634 in 2014. The hospitalization rates ranged from 54 per 100,000 to 191 per 100,000 hospitalizations. Although there are some variations from year to year, there is a definite trend toward increasing proportion of hospitalizations. The hospitalization rates were calculated per 100,000 population. They ranged from 53.5 to 190.7. There is also a similar increasing trend in the rate of hospitalizations.

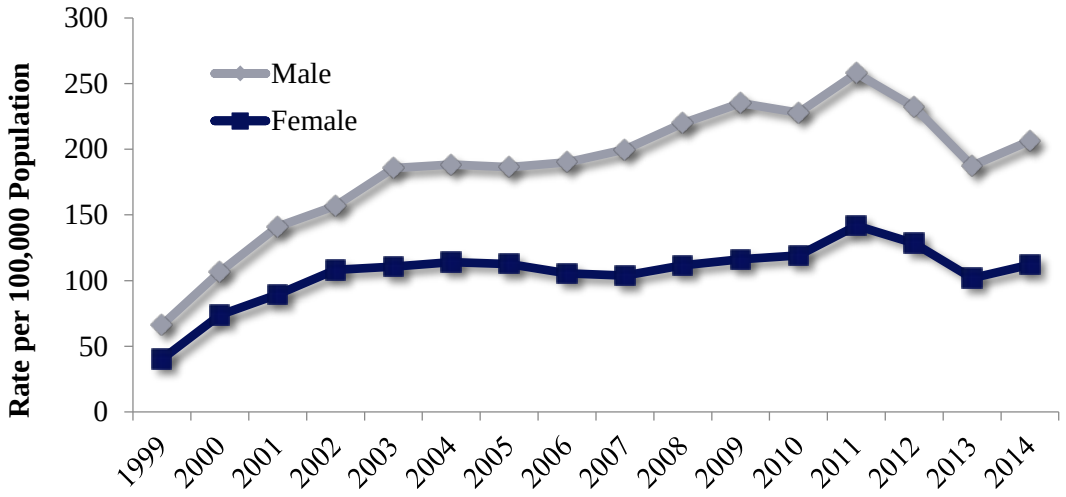
Figure 4.5.1: HCV hospitalization rate/100,000 population and trend- LA, 1999-2014



4.5.2-Sex Distribution

The overall HCV hospitalization rate for males is 186.7 per 100,000 population, and 105.6 per 100,000 population for females. There is an increased rate of disease among males, as well.

Figure 4.5.2: HCV hospitalization rates per 100,000 population by sex- LA, 1999-2014



4.5.3-Age Group Distribution

The highest rates of HCV related hospitalizations are seen among adults within the 45 to 64-year old age group. Hepatitis C hospitalizations occur most commonly in adults over the age of 25 years. There is an increasing trend in the 45 to 64-year old age group

Figure 4.5.3: HCV hospitalization rate per 100,000 population by age - LA, 1999-2014

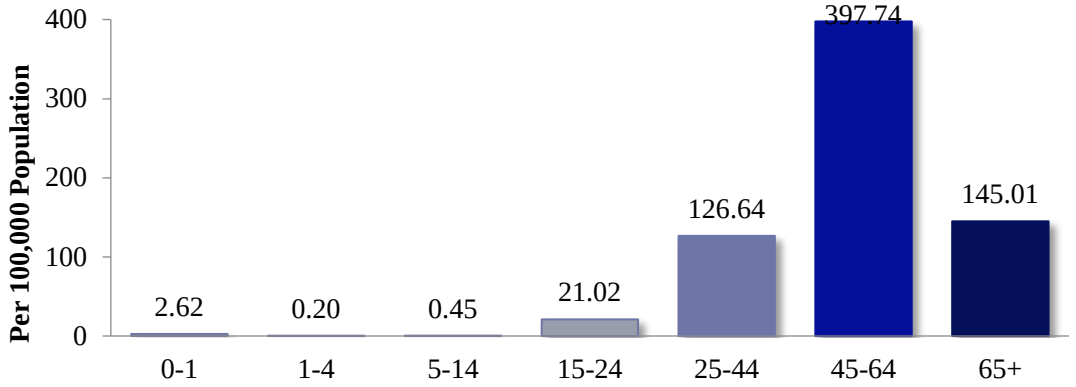
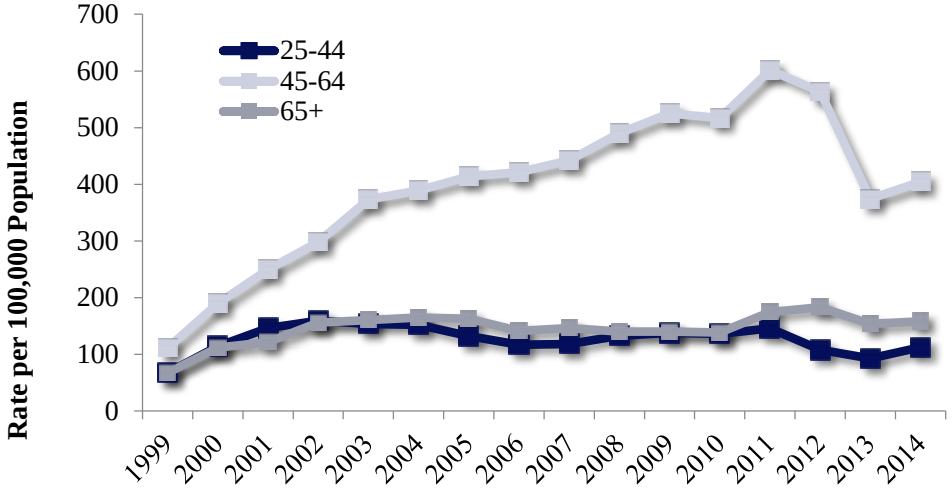


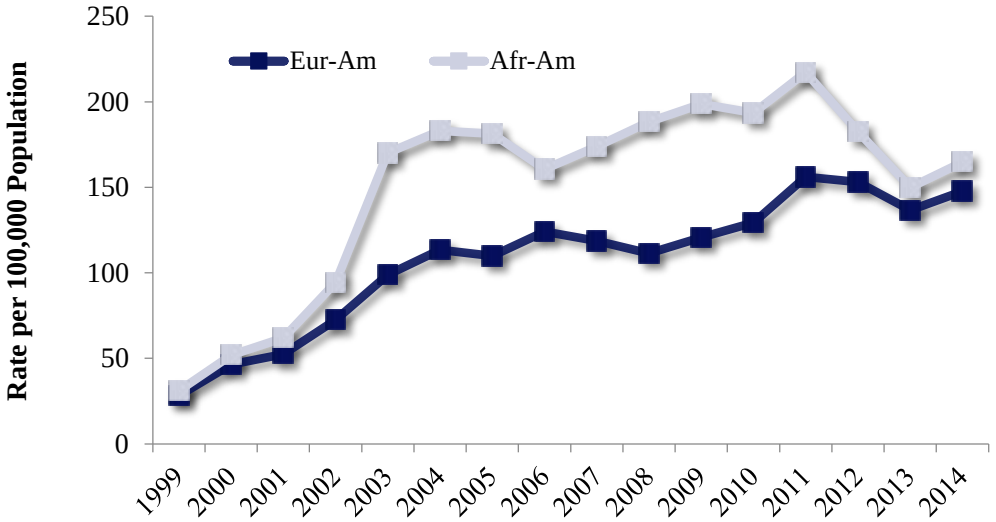
Figure 4.5.4: HCV hospitalization rate per 100,000 population by year - LA, 1999-2014



4.5.4-Racial Distribution

Hospitalization rates for were calculated for European-Americans and African-Americans only. Numbers for other racial and ethnic groups are too small to produce an accurate calculation. It is important to mention that rates based on race are underestimated due to the high number of reports which do not indicate race. The overall rates of HCV hospitalizations were 107.5 per 100,000 population for European-Americans and 150.2 per 100,000 population for African-Americans. Hospitalizations rates were higher overall among African-Americans.

Figure 4.5.5: HCV hospitalization rate by race/100,000 population- LA, 1999-2014

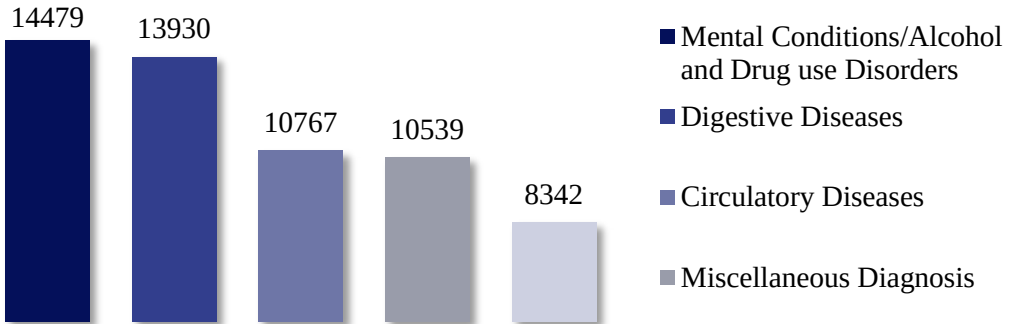


4.5.5-Admit Diagnosis

There were 87,122 admit diagnoses documented for patients hospitalized with HCV between 1999 and 2014. This number includes those hospitalized on a single occasion (20,934) and those

on hospitalized on multiple occasions (29,649). The most common reasons for admission were mental conditions (including drug dependency or poisoning, alcohol abuse, bipolar disease, depression, psychosis, and other psychiatric conditions). The next common groups were digestive diseases, circulatory diseases, and miscellaneous diagnosis.

Figure 4.7.6: Major HCV Hospitalization Diagnostic Categories– LA, 1999-2014



Only 714 admissions of all admissions indicated HCV infection as an admission diagnosis. In some cases this can be attributed to unknown HCV status, other cases may be due to incomplete documentation of known HCV status. Liver cancer represented 0.5% of the reasons for admission.

Table 4.5.7: HCV hospitalizations and admit diagnoses – LA, 1999-2014

Diagnostic Categories (N= 87257)	
Mental Conditions/Alcohol and Drug use Disorders	16.6%
Digestive Diseases	16.0%
Circulatory Diseases	12.3%
Miscellaneous Diagnosis	12.1%
Respiratory Diseases	9.6%
Infectious Diseases	5.0%
Injuries and Accidents	4.8%
Muscular and Skeletal Diseases	4.1%
Skin and Subcutaneous Diseases	3.6%
Endocrine, Metabolic and Immunologic Diseases	3.5%
Genitourinary Diseases	3.3%
Central Nervous System Diseases	2.6%
Blood Disease	2.5%
Cancer	2.3%
Pregnancy and Neonatal	1.8%

4.5.6-Discharge diagnosis

The most common discharge diagnosis was related to HCV (either chronic HCV infection or HCV infection), followed by mental conditions (including alcohol and drug use, and psychiatric conditions), other infectious diseases, and circulatory diseases. A complete breakdown of HCV discharge diagnoses is located in the appendix (Table 4.4.5).

Table 4.5.8: Main HCV Discharge Diagnoses Categories – LA, 1999-2014

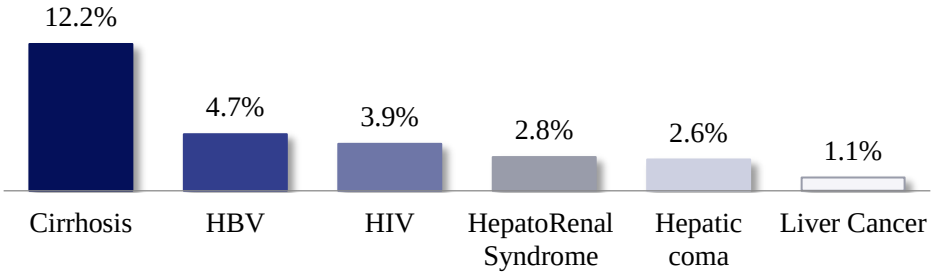
Discharge Diagnosis (n=88,700)	
HCV	19.0%
Mental Conditions	18.9%
Infectious Diseases	17.2%
Circulatory Diseases	13.4%
Miscellaneous	8.0%
Respiratory	6.1%
Liver, Digestive and Biliary Diseases	5.4%
Endocrine, Metabolic and Immunologic Diseases	4.8%
Cancer	3.3%
Trauma	1.9%
Genitourinary Diseases	1.1%
Benign Tumor	0.4%
Hepatitis Viral (other)	0.4%
Pregnancy and Neonatal	0.1%
CNS and Sense Organ Diseases	0.0%

4.5.7- Cirrhosis

Data extracted from the LAHIDD is used to determine estimates of the number of HCV-related chronic liver disease cases. This is done by searching for discharge diagnoses that are complications of chronic HCV infection. Several discharge diagnostic codes are used to identify these conditions. Among them are chronic liver disease and cirrhosis (571), alcoholic cirrhosis of the liver (571.2), cirrhosis of liver without mention of alcohol (571.5), portal hypertension (572.3), and hematemesis if associated with liver disease (578).

Among the HCV-related diseases, cirrhosis was the most common diagnosis (12.2%) among hospitalized patients. Hepatic coma and hepatorenal were less common co-morbidities, both less than 3%. Among hospitalized patients, 3.9% of the patients were co-infected with HIV and HCV and 4.7% were co-infected with HBV and HBV. There were no duplicate reports presented in this data.

Figure 4.5.9: Percent of Co-morbidities



4.5.8- Co-morbidities

The associations between cirrhosis and other co-morbidities are also displayed in the following table. The first column in the table displays the number of patients with both conditions, the second and third columns displayed the number of patients with only one condition, the fourth column displayed those with neither condition. The odds ratio (OR), confidence intervals (CI) and the p-value are statistical calculations used to determine the significance of the associations; they are presented in the right columns.

Table 4.5.10: Associations between co-morbidities

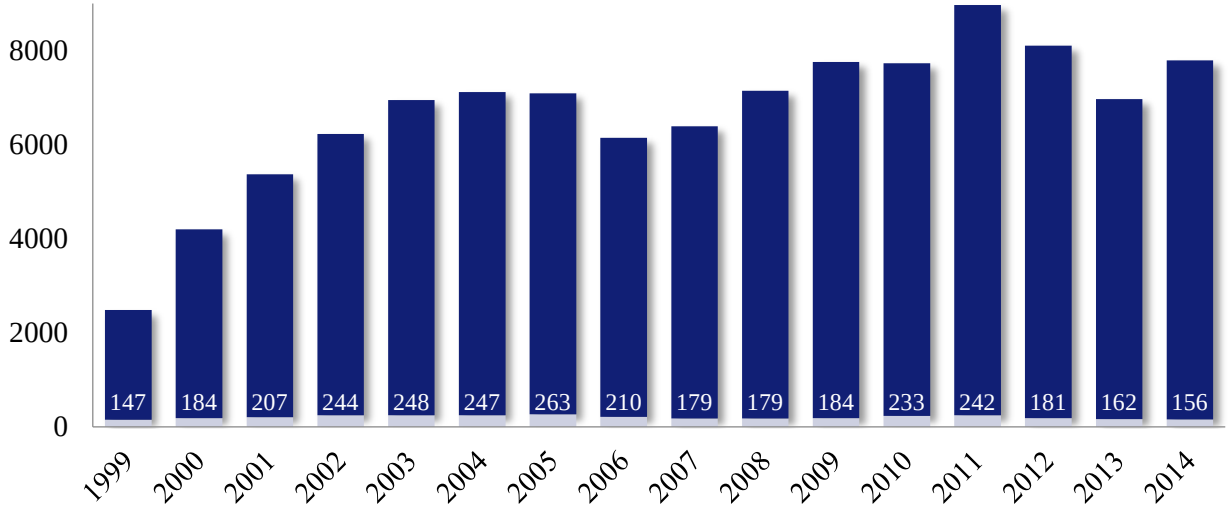
	Y&Y	Y&N	N&Y	NN	OR	CI	p-value
Cirrhosis & Hepatic coma	865	3805	120	33628	63.7	52.4-77.9	0
Cirrhosis & Hepatorenal syndrome	959	3711	131	33617	66.3	55.0-80.5	0
Cirrhosis & Alcohol	2459	2211	78	33670	480.1	381.3-611.7	0
Cirrhosis &HBV	423	4247	1328	32366	2.3	2.1-2.6	0
Cirrhosis & HIV	209	4461	1272	32476	1.2	1.0-1.4	0.02
Cirrhosis & Diabetes	215	4455	14	33724	116.3	67.7-216.4	0

Among patients with HCV infection, the most significant association is seen between cirrhosis and alcoholism. There are also significant associations between HCV/HBV and HCV/HIV, but to a lesser degree.

4.5.9-Mortality among Hospitalized Patients

From 1999 to 2014, there were 3268 deaths among hospitalized patients with HCV, an average of 204 deaths per year (Figure 4.4.7). Mortality data for HCV is presented in detail in the appendix (Table 4.4.7).

Figure 4.5.11: HCV hospitalizations and mortality – LA, 1999-2014



4.6-Mortality surveillance with vital statistics

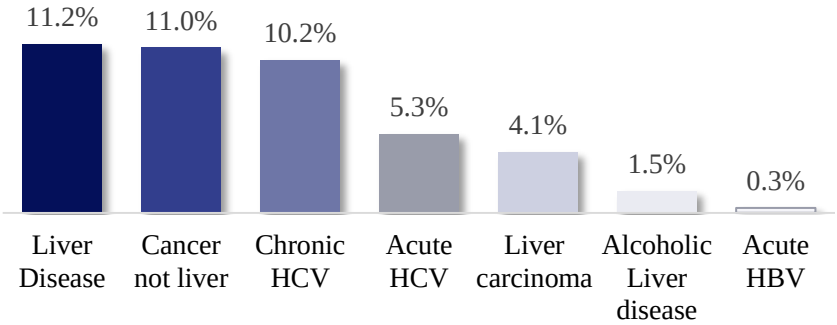
Out of the total number of cases in the register (89,001) only 16,130 were found in the death certificates (18% of all cases). Among these 3,563 were also identified through IDRIS surveillance, 6,986 were identified also through LAHIDD and 5,581 were identified through IDRIS and LAHIDD. No cases were identified through the death certificate only.

4.6.1-Causes of death of HCV infected persons

One third (32.6%) of those infected with HCV who died, had a liver related disease listed as the cause of death. Among those causes of death are liver cirrhosis liver cirrhosis (1,317), liver cancer (927), and portal hypertension (23). Mental conditions were among the other leading causes of death (316, 2.0%). Poisoning (accidental or intentional) represented 2% (322) of all deaths. Approximately 15% of reports clearly identified HCV (either acute HCV or chronic HCV) as the leading cause of death. The other liver related diseases (acute HBV, liver disease, alcoholic liver disease, and liver cancer) represent an additional 17.1% of the total causes of deaths among HCV patients.

The data presented in the following graph represents causes of deaths among HCV patients related to HCV, other liver diseases, liver cancer, other malignancies (figure 4.8.1). This data clearly exemplifies the contribution of HCV infection to the causes of death. Other causes of death are presented in detail in the appendix (Table 4.5.1).

Table 4.6.1: Liver related causes of deaths among HCV infected persons- LA 1999-2014



5-Transmission and risk factors

The hepatitis C virus was first isolated in 1989, and the first test to detect HCV became available in 1992. Transmission of HCV occurs primarily through exposure to the blood of an infected person, although other modes of transmission have been identified. The virus can survive up to three weeks outside the body on contaminated surfaces at room temperature. Items that can be contaminated with infected blood include, but are not limited to: medical equipment, syringes, needles, drug paraphernalia, manicure and pedicure equipment, piercing equipment, tattoo equipment, razors, and toothbrushes.

Transmission of HCV does NOT occur through casual contact, hugging, kissing, sneezing, coughing, sharing utensils, drinking glasses, food, water, or breast feeding.

5.1-Blood transfusion and blood products

Those who received a blood transfusion or other blood products prior to 1992 may have unknowingly been exposed to HCV and should be tested. Other blood products include plasma, immune globulin, platelets, and hemophilia treatments. Prior to 1992, cases of viral hepatitis that were negative for HAV or HBV were classified as hepatitis non-A/non-B. Nearly all (95%) cases of non-A/non-B hepatitis among those with history of blood transfusion prior to 1992 are thought to have been HCV. In addition, HCV is thought to have caused 50% of sporadic non-A/non-B hepatitis cases. Screening blood products prior to transfusion has reduced the risk of HCV exposure to less than one per two million.

5.2-Injecting drug use and other drug paraphernalia

Exposure to HCV can occur through contact with any drug paraphernalia items that are contaminated with infected blood. Sharing needles and syringes greatly increases the risk of contracting HCV and is one of the most common modes of transmission. However, any equipment and surfaces used in the preparation of injection drugs can be contaminated and become a source of HCV infection.

5.3-Occupational exposures

Occupational exposures occur when individuals who are exposed to contaminated blood items in the workplace. Medical professionals, manicurist, tattoo artist, and laboratory workers are among the occupations with the highest risk. Personal protective equipment, such as gloves, helps reduce the risk of HCV exposure.

5.3-Nosocomial HCV infections

Nosocomial infections occur from exposure to the virus while in the hospital. All health care facilities have strict guidelines for sterilization of equipment that may become contaminated with blood. Although there have been cases of HCV traced back to the use of reused or incompletely sterilized medical equipment in the past, this is exceedingly rare as a result of adherence to strict infection control practices. There have been no nosocomial infections of HCV reported in LA since 1992.

5.4- Mother-to-child transmission of HCV

Transmission can occur to a child from and HCV infected mother during pregnancy, at the time of delivery or after birth. The risk of transmission to a child is approximately 5% in a mother with high levels of the virus in her blood. Although the risk may be higher is certain populations, such as mothers who are co-infected with HIV. The mode of delivery does not appear to be associated with the risk of infection. However, trauma and lacerations sustained during delivery may increase the risk of infection. Currently there is no known treatment that can prevent mother-to-child transmission of HCV. Breastfeeding does not appear to be a mode of transmission.

The incidence of mother-to-child transmission of HCV in LA is estimated to be 6.1%, using data from the HCV registry. It is difficult to determine if these are actual infections of the newborn or passive transfer of antibodies from mother to infant with the data available. There are 99 infants who tested positive for Anti-HCV antibodies registered in the LaHIDD. Among the hospital diagnostic records, there were 1,609 records of HCV-positive women admitted for pregnancy or complications during pregnancy/delivery.

5.5-Sex with infected partner

This is an uncommon route of transmitting the HCV, especially among long-term monogamous couples. The risk of sexual transmission is increased among people with multiple sexual partners, and when sexual practices result in exposure to blood, for example from trauma.

6- Special populations

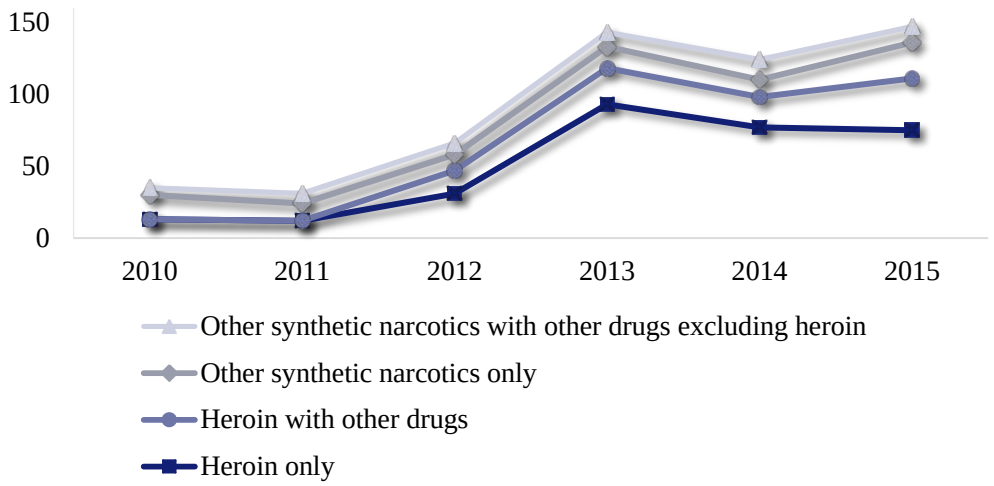
6.1-Injection drug use (IDU)

In the US, heroin use increased 63% from 2002 to 2013. Although exact statistics for the rate of HCV among IDU in LA are not available, an analysis of data from the National HIV Behavioral Surveillance (NHBS) estimated 51.5% of IDUs in New Orleans are HCV positive.

6.1.2-Death from heroin and other opioids

Prescription opioids are responsible for more deaths that vehicle accidents. In 2014, data from LEEDS reported that there were over 150,000 emergency department visits associated with heroin or other opioids per month in LA. Opioid-related deaths in LA have also surged in recent years. Data reported in the Vital Statistics records from 1999 to 2012 was used to determine the number of opioid-related deaths in LA. Data was extracted using ICD10 codes for Heroin (T40.1), other opioids (T40.2), and other synthetic narcotics (T40.4).

Figure 6.2.1: Opioid-related deaths- LA, 2010-2015



In addition to heroin, there has been an increase in fentanyl use. Fentanyl (acetyl fentanyl) is a synthetic injectable opioid. It is not possible to distinguish between prescription and illicit fentanyl in cause of death. Illicit fentanyl can be sold as heroin or combined with heroin. In the US the rate of death from overdose of synthetic opioids (fentanyl and tramadol) doubled from 2013 and 2014. According to the CDC, the increase in synthetic opioids appears to be related to an increase in the availability of illicitly manufactured fentanyl. Orleans Parish has reported an increasing number of fentanyl overdose deaths since 2014. In 2015, there were 12 fatalities from fentanyl overdose. The New Orleans Time Picayune reported that there were a total of 14 fentanyl overdose deaths reported in the first 3 months of 2016.

6.1.3- Public Health Response to IDU

In 2016, the LA Office of Public Health issued a public health advisory regarding the significant rise in opioid use. In response to the increase in opioid-related overdoses, the City of New Orleans issued a standing order for naloxone (Narcan) at two pharmacies, allowing access to anyone without a prescription. Naloxone is an emergency treatment that rapidly blocks the effects of opioids (heroin included) and can prevent death. It is available in a nasal spray that can be easily administered by an untrained bystander in the case of an opioid overdose until emergency medical services can arrive. The use of naloxone has been widely promoted in efforts to reduce fatal opioid overdoses.

In August of 2014 LA enacted several amendments to the Uniform Controlled Dangerous Substances Law that increased access to naloxone. Under previous laws, medical professionals were hesitant to prescribe and distribute naloxone due to legal concerns. Bystanders were even more wary of calling for medical care for fear of police action. Under the new law, medical professionals are exempt from legal repercussions. This allowed for naloxone to be prescribed via standing order (a prescription not requiring prior examination of the patient by the prescriber). In addition, amendments allow for naloxone to be administered by a “Good Samaritan” in the case of emergency, without legal consequences.

In September 2015 LA's health department had 8,640 doses of naloxone auto-injectors donated. Naloxone is an emergency treatment for overdoses of heroin and related drugs, and this donation is evidence of an increase in the need for overdose emergency treatment.

The federal government will allocate LA additional federal funds to combat blood borne infections from intravenous drug use. In addition, the Consolidated Appropriations Act of 2016 effectively removed the restrictions on the use of federal funds for syringe exchange programs (SSPs). This will allow more states and local governments to increase the availability of syringe exchange programs are an important resource for reducing the risk of acquiring infectious diseases (such as HCV and HIV). Approval for funding can be requested through the CDC.

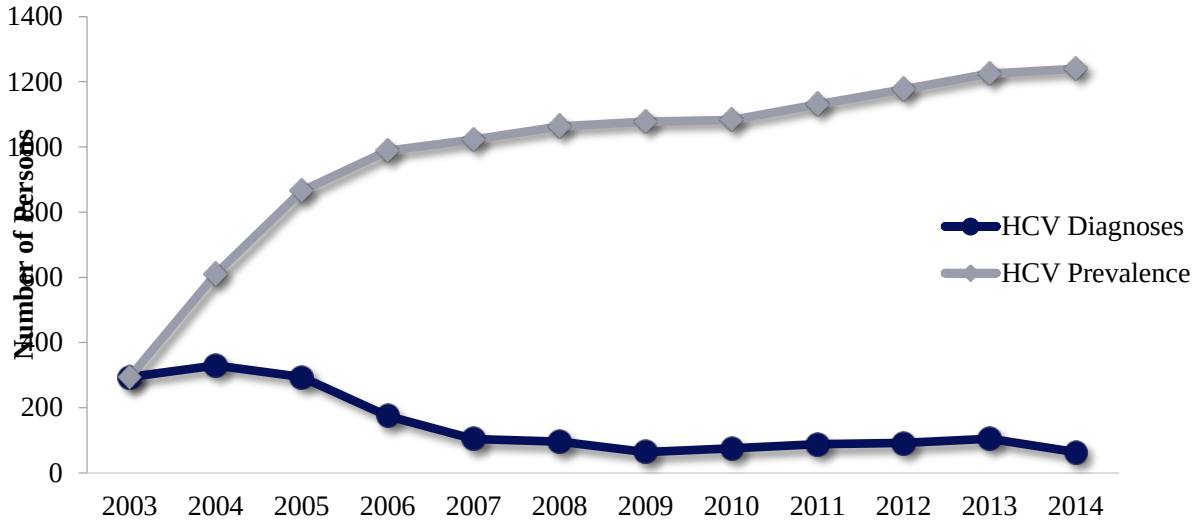
6.2-HCV and HIV Coinfection

The HIV/HCV co-infection rate in LA is the 5th highest in the nation, and ranks 12th for actual numbers among the 50 states. New Orleans ranks ninth among U.S. cities for rate of AIDS cases. In 2010, 34% of new HIV infections in the state were in New Orleans. As of December 31, 2011, 39% of all people living with HIV/AIDS in LA resided in the New Orleans metropolitan statistical area. A data-match comparing LA's HIV/HCV co-infection rate found that 6.14% of cumulative cases of people living with HIV/AIDS are co-infected with HCV in LA. Eighteen percent of cases known to have been infected with HIV via injection drug use are co-infected with HCV.

A HIV/ HCV co-infection is a serious threat to overall health due to the detrimental effects on immune response and treatment outcomes. Furthermore, patients with either disease are still subject to significant stigma and face significant challenges in accessing care throughout the state.

The best estimates of the HIV/HCV co-infection rate in the state come from a 2014 study conducted by the LA Office of Public Health. In this study, data from 2003-2014 HIV/AIDS cases were matched with HCV confirmed cases from the respective disease registries to develop an overview of the impact of co-infection on the state's health. This is likely an underestimate due to the lack of adequate HCV screening programs in LA.

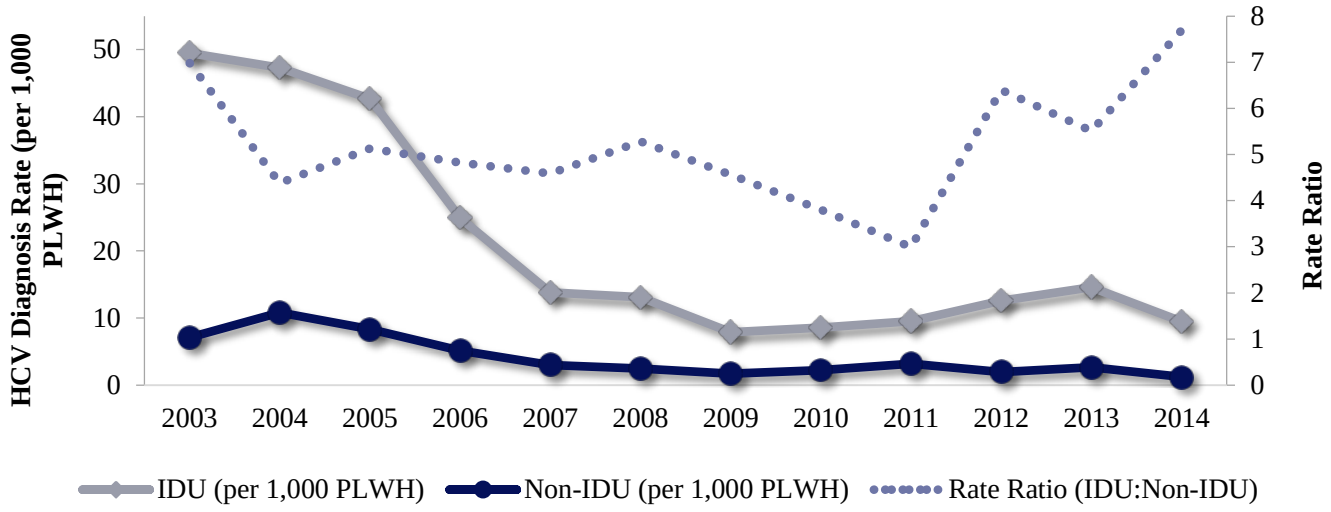
Figure 6.2.1: HCV cases and prevalence among persons living with HIV- LA, 2003-2014



Overall, 5.60% of those diagnosed with HIV/AIDS during 2003-2014 were also infected with HCV, with a total of 1096 persons. This group shared many demographic characteristics with that of those diagnosed with a HCV infection. Of those identified as co-infected 73% were African-American, 72% male, 46% between the ages of 46-55 and centered in the urban areas of New Orleans (29%) and Baton Rouge (28%). The major risk factor identified for co-infection was injection drug use, which was reported in 48% of cases. There was also an association with both men who have sex with men (MSM) (18%) and high risk heterosexuals (12%). Healthcare related co-infection was observed in less than 1% in the co-infected group and 22% had no identifiable risk behaviors for co-infection.

However, the overall rate of co-infection has remained relatively steady since approximately 2008-2009. In large part this is due to the continued co-infection among those who used injection drugs, with co-infection rates in this population remaining much higher than those who do not use injection drugs. The largest decreases in co-infection rates were been seen in IDUs, with a fivefold decrease in 2014 rates as compared to 2003.

Figure 6.2.2: HCV Diagnosis rate among persons living with HIV- LA, 2003 - 2014



6.3- HCV in the Baby Boomer Population

The US Preventive Services Task Force (USPSTF) currently recommends HCV screening for two groups: those who engage in high risk behaviors and those born between the years of 1945-1965. The latter cohort, colloquially referred to as the "baby boomers," has a disproportionate incidence of HCV infection in comparison to other age groups. Nationally, this age group has an estimated prevalence of 3.29%, representing nearly three quarters of those with chronic HCV infection. Over half of the cases identified in this group have no identifiable risk factors. Because the incidence of chronic HCV in this group is so high, the USPSTF currently recommends a onetime screening test for HCV for all baby boomers.

The reasons for this high incidence of chronic HCV among this birth cohort remain unclear. It has been strongly implicated that contaminated blood products received prior to 1992 were the most probable source of infection. Infections from transplanted organs, especially liver, were reported in this same time period. Sexual transmission, despite lower transmissibility through this route, is also thought to have played a significant role in transmission of HCV in the baby boomer population.

Figure 6.3.1: HCV cases in baby boomers by year of diagnosis- LA 1990-2015

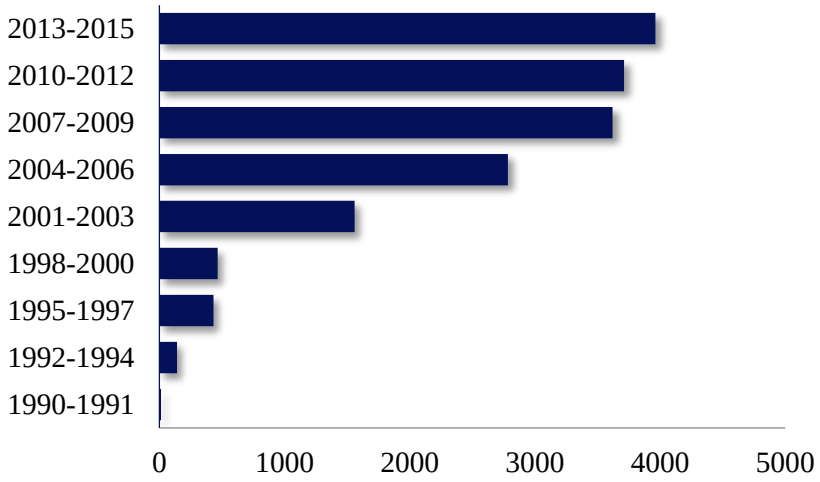
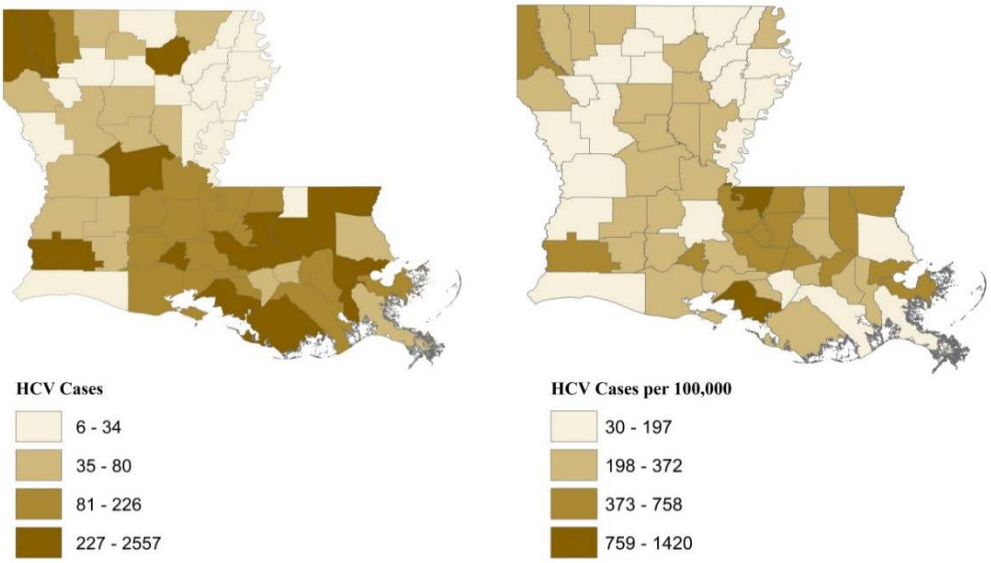


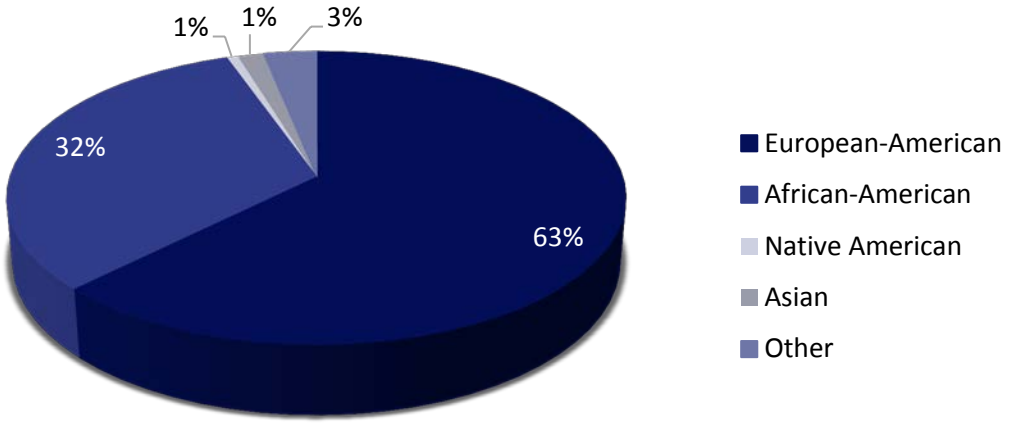
Figure 6.3.2: HCV prevalence in baby boomers by parish- LA, 2015



The incidence of chronic HCV infection in LA among the birth cohort of the years 1946 to 1964 mirrors the national trend. They make up approximately 61% of the confirmed past or present cases in the LA HCV Register, or 17,398 identified cases. The greatest incidence is in urban areas. Men make up 69% of the chronically infected in this cohort. African-Americans are disproportionately affected, consistent with greater demographic trends of HCV infection in the state, making up 47% of chronic infections among the baby boomers where race has been identified **(Figure 6.3.3)**.

Outside of the greater risk factors for HCV infection, there have not been any additional ones identified in this population in LA. Lack of access to screening continues to be an issue, and the incidence of chronic HCV among this population is thought to be higher than currently reported.

Figure 6.3.3: Racial Distribution of HCV Cases in Baby Boomers- LA 1990-2015



7-Communication and coordination with other HCV prevention programs

7.1.1-LA Viral Hepatitis Program Goals & Objectives

The objectives of the Viral Hepatitis Prevention Program (VHP) in regards the HCV infection through the IDEpi section of the Louisiana Office of Public Health is to:

1. Assess the burden of HCV infection in LA
2. Monitor trends in incidence of and risk factors for disease
3. Develop a Cost Benefits Analysis to assist Medicaid with formulary issues and Medicaid coverage benefits to HCV clients who access benefits through the program
4. Identify profiles of groups of infected persons requiring counseling and medical follow-up
5. Identify profiles of groups of contacts of infected persons requiring counseling and/or post exposure - prophylaxis
6. Identify and control outbreaks
7. Supply an expanded view of the HCV landscape in LA by specific demographics, facilitating estimation of the prevalence of cases by parish, region, or state in order to assist providers who may be considering HCV treatment as an added service to their practices.

7.1.2- LA Viral Hepatitis Program Coordinator (VHP)

The VHP coordinator is a member of the LA statewide HIV Planning Group and attends Community Planning Group (CPG) meetings quarterly. The VHP coordinator works closely with the Social Marketing Committee, ensuring that a section of CPG Strategy Planning has language that includes integrated HCV education and/or services in the plan.

The VHP coordinator also served on the New Orleans Regional AIDS Planning Council (NORAPC) for four years and served as Vice-Chair for two years. NORAPC is a federally mandated public planning body funded by the Ryan White HIV/AIDS Treatment Modernization Act of 2009 (formerly known as the CARE Act). Established in 1990, the Ryan White program strives to help people infected with HIV get into medical care and stay in care. The Ryan White program provides services to meet the medical need in several areas of the HIV/AIDS epidemic through different funding streams. The presence on the NORAPC facilitated the integration of HCV into NORAPC and its monthly activities. The VHP coordinator has collaborated with pharmaceutical representatives to speak to the council on hepatitis issues and to conduct trainings (HCV 101 & Rapid HCV Testing) for the council.

In June 2009 Go Care became the home of the first Gay Men's Clinic partially funded by the LA Office of Public Health. The VPH Coordinator was instrumental in planning, developing and implementing this project.

Since 2013 the VHP Coordinator and IDEpi (Infectious Disease Epidemiology Section) have collaborated with NO AIDS Task Force and Gilead Science to initiate HIV, STD & HCV testing in Orleans Parish Court. This ongoing collaboration was expanded in September 2014 to include offering of HCV testing to clients of NATF's New Orleans Syringe Access Program. In August 2015 the program extended their testing services to the Tulane Drop-in Center, which provides medical and social services to runaway and homeless youth, and to Walgreens Drugs.

The LA Office of Public Health HIV/STD program & IDEpi have collaborated with the Orleans Parish sheriff's office and several other organizations to identify and treat sexually transmitted disease among persons arrested in Orleans Parish, and create links for incarcerated persons to work with community organization upon release. The VHP Coordinator was a member of the collaboration committee and was instrumental in implementing this initiative and identifying funding sources to sustain the initiative.

In 2015 the VHP Coordinator collaborated with Harvard Law School on an HCV open forum and strategic planning meeting to address HCV treatment access. Through this partnership, a new HCV coalition was started.

The VHP Coordinator does approximately 25 HCV trainings per year. The trainings are geared toward healthcare workers, outreach workers, HIV, STD, TB and immunization staff and community groups, but are not limited to these groups.

7.2-HCV Coalition

The LA HCV Coalition is a group of health care providers, federally qualified health centers (FQHCs), advocates and other stake holders who have organized to address the state of the HCV epidemic and access to HCV care in LA. With support from the Harvard Law School Center for Health Law and Policy Innovation, the Coalition is actively working to increase awareness of HCV and programs addressing the needs of those living with or at risk for viral hepatitis through education, advocacy in LA.

7.3-Screening

Screening individuals for viral hepatitis infections has long been a goal of the LA VHP, but the lack of funding has prevented this from happening. However, through collaborative efforts with the VHP coordinator and statewide clinics, HCV testing and treatment services have been implemented in nine of the 34 FQHCs in LA.

The following FQHCs offer HCV testing and/or treatment service:

1. Crescent Care Clinic (New Orleans) – HCV Testing & Treatment
2. Common Ground Health Clinic (Algiers) – HCV Testing & Treatment
3. Daughters of Charity (New Orleans) - HCV Testing & Treatment
4. EXCELth (Algiers, New Orleans, Gentilly & Baton Rouge) – HCV Testing & Treatment
5. HAART (Baton Rouge) – HCV Testing & Treatment
6. HOP Clinic (New Orleans) - HCV Treatment Only (must have prior HCV Dx)
7. W.O. Moss Memorial Clinic, Comprehensive Care Clinic (Lake Charles) - HCV Testing & Treatment
8. No AIDS Task Force (New Orleans) – HCV Testing & Treatment; Crescent Care
9. Odyssey House (New Orleans) - HCV Testing Only
10. Priority Health (Marrero) - HCV Testing & Treatment
11. St. Thomas Clinic (New Orleans, Algiers)) – HCV Testing & Treatment
12. Tulane Medical School (New Orleans) - HCV Testing Only (Homeless Only)

Despite the critical need for HCV screening in New Orleans, there is currently no free or low-cost screening. HCV screening of individuals in high risk groups is cost-effective, can prevent transmission, and can avert deaths. IDEpi partnered with NO AIDS Task Force to implement a HCV screening program that would target those at highest risk for HCV and low income residents of the New Orleans metropolitan statistical area between the ages of 45 and 64. These two demographic populations already constitute a significant portion of the population that NO AIDS Task Force reaches through counseling and testing for HIV.

7.4-Challenges: Linkage to care and retention in care

Louisiana does not have any statewide programs linking individuals living with HCV infection into care. Comprehensive programs which include insurance evaluation, insurance application assistance, assistance with scheduling primary care and HCV specialist appointments, and reminder calls and texts for appointments have been found to be effective in having those diagnosed with HCV enter and complete treatment. These programs are modeled after those established for HIV treatment. Currently most individuals diagnosed are referred to specialists privately without these additional support services. Various private programs exist in the state through nonprofit foundations and health systems, but they are not unified in scope or practice. Several of these programs focus on those with HIV co-infection as they utilize federally designated Ryan White funds to provide these programs. Current programs include Crescent Care of New Orleans and Caring Clinic of Baton Rouge, both Federally Qualified Health Centers.

7.5-Behavioral surveillance

The NO AIDS Task Force has implemented the National HIV Behavioral Surveillance program (NHBS) since 2006. The NHBS conducts HIV counseling and testing with 500-700 people per year. Each year the program targets a particular population considered to be at high risk for HIV: men who have sex with men (MSM), injection drug users (IDU), and high risk heterosexuals (HET). The latter group consists of individuals who are residents of neighborhoods that are low income and are associated with high rates of HIV. From August 2012 to January 2013, NHBS recruited approximately 600 active injection drug users and from August 2013 to January 2014, approximately 500 high risk heterosexuals. Individuals who report IDU risk and individuals who fall within the age range 45-64 also will be recruited for HCV screening. During each time period, the prevalence of HCV among IDUs was approximately 75%.

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Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
ASTHO	Association of State and Territorial Health Officials
BRFSS	Louisiana Behavioral Risk Factor Surveillance Survey
CDC	Center for Disease Control & Prevention
CPG	Community Planning Group
ELR	Electronic Laboratory Reports
HAV	Hepatitis A Virus
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HET	High risk heterosexuals
HIV	Human Immunodeficiency Virus
IDEPI	Infectious Disease Epidemiology Section
IDRIS	Infectious Disease Reporting Information System
IDU	Injection drug users
LA	Louisiana
LAHIDD	Louisiana Hospital Inpatient Discharge Database
LOPH	Louisiana Office of Public Health
LDHH	Louisiana Department of Health and Hospitals
LEEDS	Louisiana Early Event Detection System
LTR	Louisiana Tumor Registry
MSM	Men who have sex with men
NATF	NO AIDS Task Force
NBS	NEDSS Base System
NEDSS	National Electronic Disease Surveillance System
NORAPC	New Orleans Regional AIDS Planning Council
NOSAP	New Orleans Syringe Access Program
OPSO	Orleans Parish Sheriff's Office
RNA	Ribo Nucleic Acid (genetic material)
VHPC	Viral Hepatitis Prevention Coordinator
VHP	Viral Hepatitis Prevention Program

Definitions:

Fibrosis

Early scarring due to infection and injury of the live, chronic HCV infection being a common cause. May progress to cirrhosis and hepatocellular carcinoma over time.

HCV Case, Acute

Includes newly infected individuals who are symptomatic and have elevated liver enzymes as an indicator of recent infection.

Confirmed: meets the clinical case definition and is laboratory confirmed.

Probable: meets clinical case definition, antiHCV EIA positive, but the anti-HCV EIA result has not been verified by an additional more specific assay or the signal to cut-off ratio is unknown

HCV Case, Past or Present Infection

Includes cases with serologic tests indicating HCV infection which newly reported to the Office of Public Health, without possibility of determination of date of infection. (This reporting category was added in 2003.)

Confirmed: laboratory confirmation

Probable: Anti-HCV EIA positive EIA and elevated ALT

Suspect: AntiHCV EIA positive only

HCV Diagnostic Tests

Laboratory tests used for the confirmation of an HCV infection. There are two main types. One is based on antibodies, which measures the immune response to a past or present infection. The other major type is based on the presence of viral genetic material, specifically ribonucleic acids (RNA).

Antibody Based

- Enzyme Immunoassay (EIA)
- Chemiluminescence Immunoassay (CIA)

Nucleic Acid Based

- Qualitative HCV RNA, determines if HCV infection is present
- Quantitative HCV RNA, non-diagnostic, used to help determine effectiveness of treatment

Incidence

The amount of people who were identified with HCV in Louisiana in a given year. This is not indicative of year of occurrence, but instead of the year when the HCV case was diagnosed.

Louisiana HCV Register

Louisiana's state registry of all HCV infections reported to the state. The registry currently includes 89,000 cases, registered since 1990. The registry uses the following data sources to identify cases: IDRIS, ELR, LAHIDD, SCHS.

Prevalence

The total amount of people with HCV infection, past or present in the Louisiana at a given time. As this is based on the data from the Louisiana HCV Register, it does not account for cases diagnosed out of state, cases which self-resolve, or cases which responded appropriately to treatment.

Annex Tables

Table 4.1: Distribution of Cases in Register According to Source- LA, 2014

	IDRIS	LAHIDD	Deaths	Count
	Y	N	N	47,020
	Y	N	Y	3,563
	Y	H	N	13,524
	Y	H	Y	5,581
	N	H	N	12,327
	N	H	Y	6,986
Yes	69,688 (78.3%)	38,418 (43.2%)	16,130 (18.1%)	
No	19,313 (21.7%)	50,582 (56.8%)	72,871 (81.9%)	
		Total		**89,001**

Table 4.4.5: HCV hospitalizations and admit diagnoses – LA, 1999-2014

Hospitalization and Admit Diagnosis (n=87,122)	Number	%
Mental Conditions/Alcohol and Drug use Disorders	**(14,344)**	**16.6%**
Drug dependency	4982	
Alcohol Abuse	2270	
Other psychiatric disorders	1838	
Psychosis	1323	
Dysfunctional Mental disorders	1321	
Bipolar Disease	1201	
Depression	956	
Poisoning	135	
Miscellaneous	453	
Digestive Diseases	**13,930**	**16.0%**
Liver disease	4231	
Biliary disease	880	
Melena	2388	
Hematemesis	776	
Diarrhea	216	
Enteric pathogen	96	
Miscellaneous	4575	
HAV	4	
HBV	43	
HCV	714	
Hepatitis Viral	7	
Circulatory Diseases	**10,767**	**12.3%**
Cardiovascular diseases	5698	
Cerebrovascular diseases	940	
Heart diseases	597	
Miscellaneous	3532	
Miscellaneous	**10,539**	**12.1%**
Respiratory Diseases	**8,342**	**9.6%**
Infectious Disease	**4,393**	**5.0%**
HIV	1060	
Miscellaneous	3333	
Cancer	**1,966**	**2.3%**
Benign Tumor	165	
Cancer	1087	
Liver cancer	456	
Miscellaneous	258	
CNS & Sense Organ Diseases	**(2,262)**	**2.6%**
Endocrine, Metabolic and Immunologic Diseases	**(3,054)**	**3.5%**
Diabetes	1455	
Miscellaneous	1599	
Genitourinary Diseases	**(2,951)**	**3.3%**
Blood Diseases	**(2,139)**	**2.5%**
Injuries and Accidents	**(4,147)**	**4.8%**
Muscular and Skeletal Diseases	**(3,591)**	**4.1%**
Pregnancy and Neonatal Conditions	**(1,609)**	**1.8%**
Skin and Subcutaneous Diseases	**(3,124)**	**3.6%**

Table 4.4.5: HCV Discharge Diagnoses – LA, 1999-2014

Hospital Discharge Diagnosis (n= 88,700)	Number	%
HCV	**16,831**	**19.0%**
Chronic HCV	14,757	
HCV infection	2,074	
Mental Conditions/Alcohol and Drug use Disorders	**16,740**	**18.9%**
Alcohol disorders	3,115	
Anxiety disorders	120	
Bipolar disorder	1,185	
Dementia	20	
Depression	1,979	
Drug Abuse	5,741	
Mental (other)	420	
Paranoia	14	
Psychotic Disease	1,695	
Psychological (other)	1,739	
Poisoning	712	
Infectious Diseases	**15,232**	**17.2%**
HIV	3,263	
Infection (Other)	11,943	
Necrotizing infection	26	
Infectious Diseases	**15,232**	**17.2%**
Circulatory Diseases	**11,856**	**13.4%**
Cardiovascular diseases	9,948	
Cerebrovascular diseases	1,219	
Heart diseases	689	
Miscellaneous	**7,055**	**8.0%**
Respiratory	**5,390**	**6.1%**
Liver, Digestive and Biliary Diseases	**4,767**	**5.4%**
Alcoholic cirrhosis	2,493	
Biliary diseases	258	
Cholecystitis	995	
Liver disease (other)	247	
Liver Transplant	41	
Hematemesis	123	
Melena	610	
Endocrine, Metabolic and Immunologic Diseases	**4,267**	**4.8%**
Diabetes	2,528	
Thyroid diseases	195	
Pancreatic diseases	1,544	
Cancer	**2,938**	**3.3%**
Liver cancer	1,027	
Other	1,911	
Trauma	**1,728**	**1.9%**
Genitourinary Diseases	**1,004**	**1.1%**
Renal diseases	995	
Urinary diseases	9	
Hepatitis Viral (other)	**385**	**0.4%**

HAV infection	32	
HBV infection	353	
Benign Tumor	**343**	**0.4%**
Pregnancy and Neonatal	**126**	**0.1%**
CNS and Sense Organ Diseases	**38**	**0.0%**

Table 4.4.6: Proportions with co-morbidities

Proportions with co-morbidities (n= 38,418)		Percent
Cirrhosis	4670	12.2%
Hepatic coma	985	2.6%
HepatoRenal Syndrome	1090	2.8%
Liver Cancer	409	1.1%
Diabetes	229	0.6%
HIV	1481	3.9%
HBV	1805	4.7%

Table 4.4.7: HCV hospitalizations and mortality – LA, 1999-2014

Year	Hospitalizations	Deaths	Percent
1999	2337	147	6.3%
2000	4014	184	4.6%
2001	5163	207	4.0%
2002	5982	244	4.1%
2003	6699	248	3.7%
2004	6873	247	3.6%
2005	6830	263	3.9%
2006	5934	210	3.5%
2007	6211	179	2.9%
2008	6965	179	2.6%
2009	7573	184	2.4%
2010	7497	233	3.1%
2011	8724	242	2.8%
2012	7922	181	2.3%
2013	6805	162	2.4%
2014	7634	156	2.0%

Table 4.5: Causes of death among HCV infected persons- LA

Cause of death (N=16,130)	Number	Percent
Cardiovascular	2261	14.0%
Liver Disease	1809	11.2%
Cancer not liver	1772	11.0%
Chronic HCV	1638	10.2%
Infectious Disease	1395	8.6%
Miscellaneous	932	5.8%
Acute HCV	847	5.3%
Respiratory Diseases	661	4.1%
Liver carcinoma	655	4.1%
Genitourinary Disease	627	3.9%
Digestive System Diseases	564	3.5%
Myocardial infarction	436	2.7%
Diabetes	418	2.6%
External Conditions	407	2.5%
Mental Behavioral Conditions	316	2.0%
Poisoning Accidental	292	1.8%
Alcoholic Liver disease	235	1.5%
Signs/Symptoms	233	1.4%
CNS Disease	202	1.3%
Endocrine, Metabolic, Nutrition	115	0.7%
Hematologic Diseases	89	0.6%
Skin, Musclar, Connective Diseases	85	0.5%
Poisoning Intentional	64	0.4%
Acute HBV	52	0.3%
Pregnancy & Neonatal Conditions	25	0.2%

Table 5.3.1: Opioid Related Death by Parish (Rate / 100,000 population)- LA, 1999-2012

Parish	Rate	Parish	Rate
Acadia	1.6	Allen	0.3
Bienville	2.9	Ascension	0.1
Bossier	1	Assumption	0
Caddo	0.8	Avoyelles	0.1
Caldwell	3	Beauregard	0.2
Cameron	0.8	Calcasieu	0
Catahoula	1.7	Concordia	0.3
Claiborne	2.2	De soto	0.5
East Carroll	1.5	East Baton Rouge	0.1
Evangeline	0.9	East Feliciana	0
Grant	2.1	Franklin	0.6
Jackson	0.8	Iberia	0.5
Jefferson Davis	3.3	Iberville	0.2
Lafayette	0.6	Jefferson	0
Lafourche	0.9	LaSalle	0.4
Morehouse	1.1	Lincoln	0.3
Ouachita	1.2	Livingston	0.2
Plaquemines	1.8	Madison	0
Rapides	1.1	Natchitoches	0.6
St Bernard	2	Orleans	0.4
St Charles	1.3	Pointe Coupee	0
St Helena	1.2	Red river	0
St John	1.1	Richland	0
St Landry	0.8	Sabine	0
St Mary	0.9	St James	0.3
St Tammany	7.7	St Martin	0.5
Tangipahoa	1.5	Tensas	0
Terrebonne	1	Vermilion	0.4
Union	1.4	Vernon	0.4
Washington	2.8	West Baton Rouge	0.6
Webster	1.3	West Carroll	0
Winn	6.3	West Feliciana	0
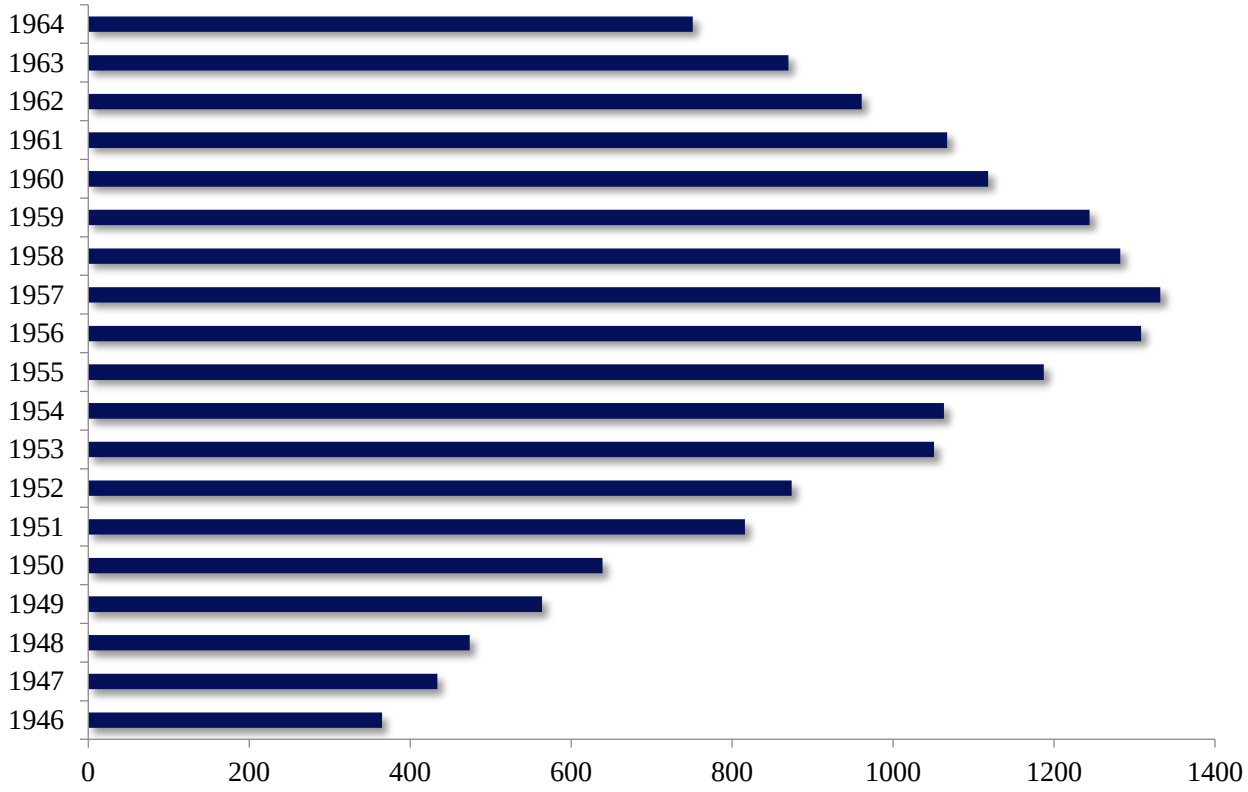
Figure 5.4.3: HCV Cases in Baby Boomers by Year of Birth- LA 1990-2015