

Florida Hepatitis Surveillance Report 2002-2006

FLORIDA DEPARTMENT OF HEALTH
Hepatitis Prevention Program



Charlie Crist
Governor

Ana M. Viamonte Ros, M.D., M.P.H.
State Surgeon General, Department of Health

Preface

The 2008 Hepatitis Surveillance Report presents statistics and trends about viral hepatitis in Florida from January 1, 2002, through December 31, 2006. This publication, which summarizes viral hepatitis case reports received from county health departments, laboratories, and other public and private providers, is intended as a reference document for policymakers, program managers, health planners, researchers, and others who are concerned with the public health impact of these diseases. Please send comments and suggestions to:

Administrator, Florida Hepatitis Prevention Program
Bureau of HIV/AIDS, Florida Department of Health
4052 Bald Cypress Way, Bin A-09
Tallahassee, Florida 32399-1720.

Suggested Citation

2008 Hepatitis Surveillance Report
Florida Hepatitis Prevention Program
Florida Department of Health
Tallahassee, Florida

Acknowledgements

Publication of this report would not have been possible without the contributions of the local health departments, which provide state and local surveillance data to the Florida Department of Health surveillance programs, and the Bureau of Laboratories, which provides viral hepatitis testing and results reporting.

This report was prepared by the following staff members of the Florida Hepatitis Prevention Program, Bureau of HIV/AIDS, Florida Department of Health: Linda M. Baldy, M.P.H., Philip E. Reichert, M.P.H., and Cyndena A. Hall, B.A.

Internet Access to Florida Hepatitis Information

This report is available on the Internet at:

www.doh.state.fl.us/Disease_ctr//aids/hep/index.html

Contents

Executive Summary.....	1
Introduction.....	4
Acute Hepatitis A.....	6
Acute Hepatitis B.....	10
Chronic Hepatitis B.....	14
Acute Hepatitis C.....	15
Chronic Hepatitis C.....	17
Conclusion.....	18

List of Figures

Figure 1.	Incidence of Acute Viral Hepatitis, Florida, 2002-2006.....	2
Figure 2.	Florida Counties by Geographic Region and Funding Year.....	3
Figure 3.	Incidence of Hepatitis A, Florida and the U.S., 2002-2006.....	6
Figure 4.	Incidence of Hepatitis A by Age Group, Florida, 2002-2006.....	8
Figure 5.	Incidence of Hepatitis A by Gender and Male/Female Ratio Florida, 2006	8
Figure 6.	Incidence of Hepatitis A by Ethnicity, Florida, 2002-2006.....	8
Figure 7.	Proportion of Hepatitis A Cases by Risk Factor Florida, 2002-2006.....	9
Figure 8.	Incidence of Acute Hepatitis B, Florida and the U.S., 2006.....	10
Figure 9.	Incidence of Acute Hepatitis B by Age Group, Florida, 2002-2006.....	11
Figure 10.	Incidence of Acute Hepatitis B by Gender and Male/Female Ratio Florida, 2002-2006.....	11
Figure 11.	Incidence of Acute Hepatitis B by Race and Ethnicity, Florida 2002-2006	12
Figure 12.	Incidence of Acute Hepatitis B by Ethnicity, Florida, 2002-2006.....	12
Figure 13.	Proportion of Acute Hepatitis B Cases by Risk Factor Florida and the U.S., 2006.....	12
Figure 14.	Acute Hepatitis C Cases by Florida Incidence and U.S. Estimated Number 2002-2006	15
Figure 15.	Incidence of Acute Hepatitis C by Age Group, Florida, 2002-2006.....	16
Figure 16.	Incidence of Acute Hepatitis C by Gender and Male/Female Ratio Florida, 2002-2006	16
Figure 17.	Incidence of Acute Hepatitis C by Race and Ethnicity, Florida, 2002-2006.....	16

List of Tables

Table 1.	Cases and Case Rates of Acute Viral Hepatitis, by Type and Year Florida, 2002-2006	2
Table 2.	Reported Cases of Hepatitis A by Age, Sex, Race, and Ethnicity Florida, 2002-2006.....	7
Table 3.	Clinical Characteristics of Patients with Hepatitis A by Age Group Florida, 2002-2006 (crude frequency).....	9
Table 4.	Reported Cases of Acute Hepatitis B by Age, Sex, Race, and Ethnicity Florida, 2002-2006	13
Table 5.	Clinical Characteristics of Patients with Acute Hepatitis B, by Age Group 2002-2006 (crude frequency).....	14
Table 6.	Reported Cases of Chronic Hepatitis B by Age, Sex, Race, and Ethnicity Florida, 2002-2006	14
Table 7.	Reported cases of Chronic Acute Hepatitis C by Age, Sex, Race and Ethnicity, Florida, 2002-2006.....	17
Table 8.	Proportion of Acute Hepatitis C by Risk Factor, Florida, 2002-2006.....	17
Table 9.	Reported Cases of Chronic Hepatitis C by Age, Sex Race and Ethnicity, Florida, 2002-2006.....	18

Executive Summary

Despite dramatic declines in the rates of acute viral hepatitis rates (Figure 1) over the past five years, viral disease due to hepatitis A, B, and C continues to be an important public health problem, causing significant morbidity and mortality in Florida. Based on national estimates, more than 300,000 Floridians are infected with hepatitis C, but the majority are unaware they are infected. The incidence of acute hepatitis B in Florida has averaged approximately 3.0 per 100,000 people over the last five years (Table 1), and outbreaks and increased rates of hepatitis A continue to be seen among several groups in Florida.

The state legislature recognized the importance of chronic hepatitis prevention and control in the 1999 session by appropriating \$2.5 million to develop a comprehensive hepatitis and liver failure prevention and control program. The legislature continued its support of the comprehensive program by appropriating \$3.4 million in subsequent years.

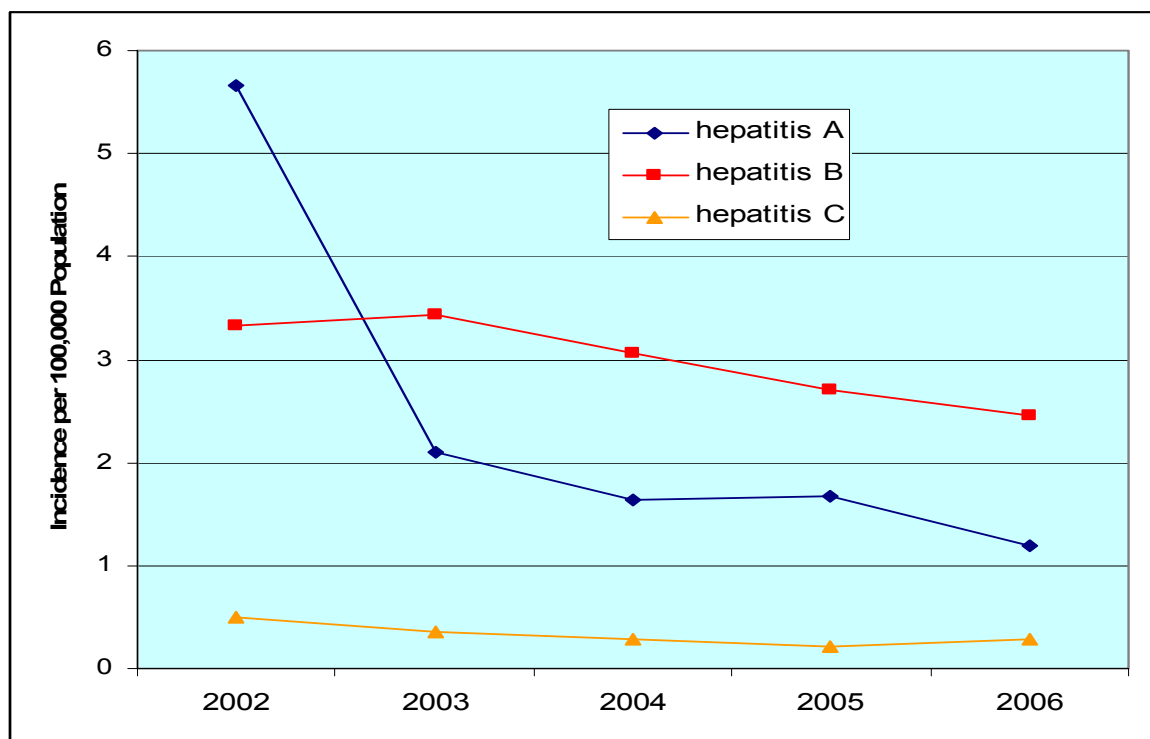
Florida's comprehensive statewide hepatitis prevention goals are:

- Raise statewide awareness of viral hepatitis
- Develop and distribute educational information
- Coordinate and collaborate regarding intervention, prevention, and disease control programs
- Track the burden of disease through hepatitis case surveillance and reporting
- Conduct research and evaluation
- Reduce hepatitis morbidity and mortality

To accomplish these goals, in 2000 the program funded Broward, Collier, Miami-Dade, Monroe, Pinellas, and Polk counties to provide comprehensive hepatitis services to residents at high risk for infection or for the serious consequences of infection (Figure 2). In 2002, Escambia, Lee, and Seminole counties received minimal funding to establish a dedicated hepatitis prevention program. In 2005, the program was able to provide limited resources to Alachua, Bay, Okeechobee, and Palm Beach counties. In 2007, funding was available for Duval and Orange counties. Hepatitis A and B vaccines, as well as testing for hepatitis A, B, and C, are available at no cost for high-risk adults. Efforts continue to integrate hepatitis programs and activities with HIV/AIDS, immunization, sexually transmitted disease (STD), and corrections programs that offer vaccine, testing, and educational services.

The Florida Viral Hepatitis Council (VHC) was established in 2004 to encourage and promote the combined efforts of dedicated, skilled individuals and organizations towards reducing the growing burden of viral hepatitis on Floridians, their families, and communities. The 20-member council is charged with developing, writing, and maintaining the Florida comprehensive hepatitis prevention plan. It includes representation from the community, private health care, public health, corrections, academic institutions, drug treatment, and other areas. Meeting twice a year, the VHC provides advice and guidance to the Florida Hepatitis Prevention Program on viral hepatitis related issues.

**Figure 1. Incidence of Viral Hepatitis
Florida, 2002-2006**



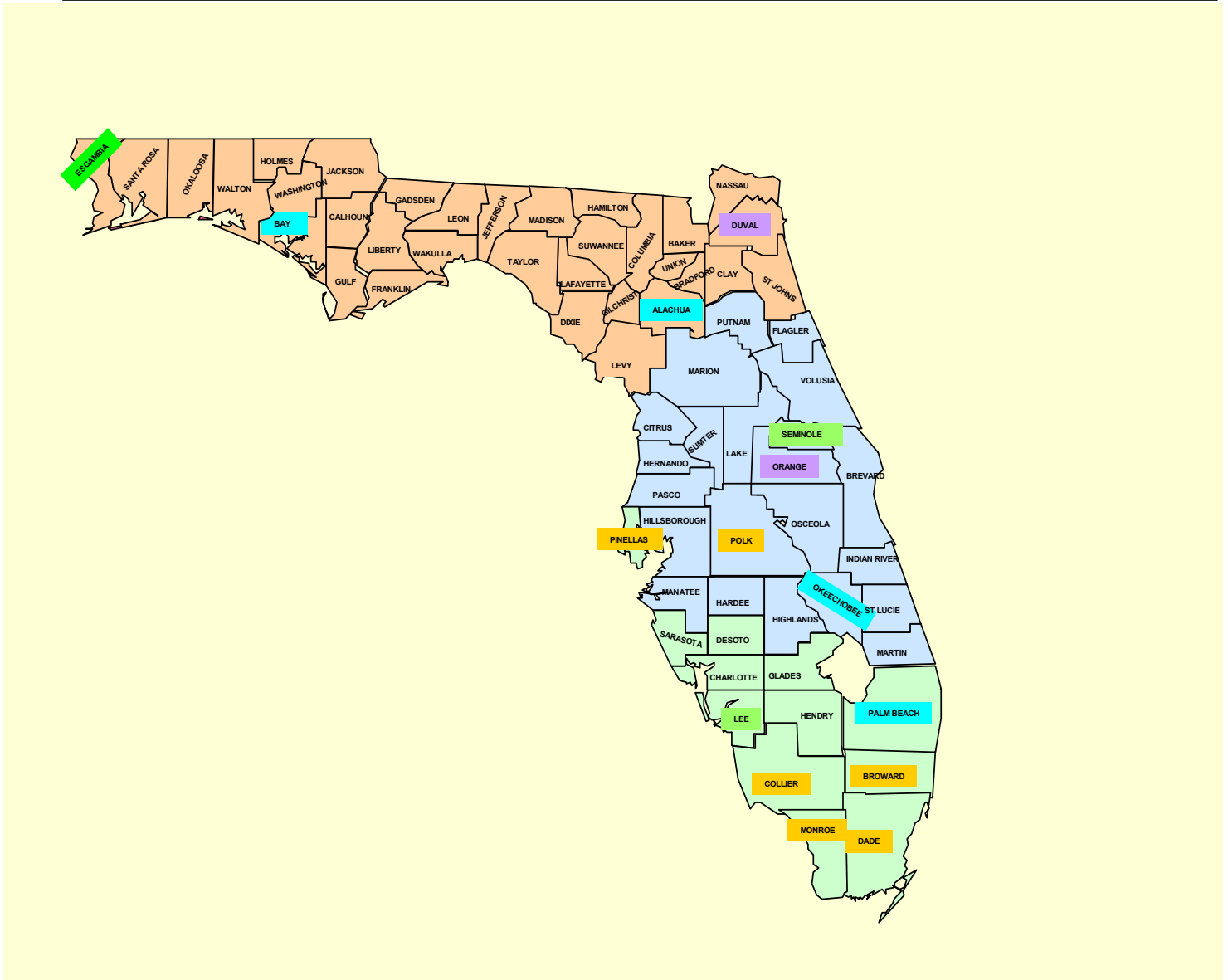
DATA SOURCE: Bureau of Epidemiology, Merlin® ((2002-2006), FL DOH
 POPULATION DATA: CHARTS, Office of Planning, Evaluation, and Data Analysis, FL Department of Health
 Data represent reported cases (confirmed, probable, and suspect case status)

Table 1. Cases and Case Rates of Acute Viral Hepatitis, by Type and Year, Florida, 2002–2006

Year	Hepatitis A		Hepatitis B		Hepatitis C	
	# cases	rate*	# cases	rate*	# cases	rate*
2002	951	5.67	559	3.33	82	0.49
2003	361	2.10	584	3.43	61	0.36
2004	286	1.63	537	3.07	51	0.29
2005	303	1.68	488	2.71	39	0.22
2006	219	1.19	453	2.46	51	0.28

Data Source: Bureau of Epidemiology,
 * Rate per 100,000 population.
 Data represent reported cases (confirmed, probable, and suspect case status).

Figure 2. Florida Counties by Geographic Regions and Funding Year



Geographic Regions:	■ North	■ Central	■ South
Funded Counties:	□ 2001 Broward Collier Miami-Dade Monroe Pinellas Polk	□ 2002 Escambia Lee Seminole	□ 2005 Alachua Bay Okeechobee Palm Beach
			□ 2007 Duval Orange

Introduction

This report summarizes surveillance data collected during 2002-2006 for acute hepatitis A, hepatitis B, and hepatitis C. It interprets statewide surveillance information with the objective of providing serologic, demographic, and epidemiologic information that will aid in formulating strategies and policies for the prevention and control of these diseases.

METHODS

Conditions for which Surveillance is Conducted. Statewide surveillance in Florida is conducted for acute hepatitis A, B, C, D, E, G, nonA/nonB, and unspecified acute hepatitis. Statewide reporting of perinatal hepatitis B virus (HBV) infections was implemented in 1998, and providers were requested to begin reporting of past or present chronic HBV and hepatitis C virus (HCV) infections in mid-2000. This report addresses reported cases of acute and chronic disease, which includes confirmed, probable, and suspect cases.

Data Sources. The Florida Department of Health (DOH) receives notifiable disease case reports from local county health departments through Merlin®, Florida's official web-based system for disease reporting, surveillance, and analysis activities. On a weekly basis, the state then reports cases to the Centers for Disease Control and Prevention's (CDC) National Notifiable Diseases Surveillance System (NNDSS). Reports are submitted electronically to the CDC via the National Electronic Telecommunications System for Surveillance (NETSS).

Collection of surveillance data depends on the cooperation of local health departments, public health practitioners, public and private laboratories, and medical providers reporting the diseases from their hospitals, clinics, and offices. Participation by providers in the reporting of viral hepatitis cases is required

by law (Chapter 64D-3, *Florida Administrative Code*). All county health departments collect and report basic information (e.g., event date, source of report, demographic characteristics) about cases of acute viral hepatitis that are identified in their county. Data are reported by the county in which the patient resided at the time of diagnosis. Counties are also asked to report additional epidemiologic information (e.g., laboratory test results, clinical information, and exposure history) regarding investigated cases. However, the completeness and accuracy of reporting these additional data elements vary among and within counties, with more complete information for acute than for chronic cases.

To date, surveillance efforts for viral hepatitis have focused on cases of newly acquired, clinically apparent disease; most cases of acute viral hepatitis have historically been identified on the basis of a clinician's report of a patient with an illness compatible with acute hepatitis. With the implementation of laboratory reporting requirements, reporting of serologic markers for viral hepatitis from laboratories is an increasingly common route by which suspected cases are identified and reported to the state and to local county health departments. In addition to acute cases, laboratory-based reporting may identify asymptomatic individuals with newly acquired infections, individuals with chronic infections, and individuals for whom there is insufficient information to verify the diagnosis based on laboratory testing alone.

Case Definitions for Acute Viral Hepatitis.

Hepatitis cases are required to meet a clinical definition for acute disease and virus-specific laboratory criteria for diagnosis following state-approved case definitions.

The clinical characteristics are the same for all types of viral hepatitis; consequently, laboratory testing is needed to identify the specific agent for illness. Case criteria vary according to case classification, i.e., confirmed, probable, or suspect. A *confirmed* case is one that meets the clinical definition and is laboratory-confirmed. For hepatitis A, a case is also considered confirmed if it meets the clinical definition and is epidemiologically linked to a laboratory-confirmed hepatitis A-infected individual.

ANALYSES

Incidence rate calculations. Crude incidence rates of new cases are calculated per 100,000 population on an annual basis using the Community Health Assessment Resource Tool Set (CHARTS) estimates of the Florida resident population. Some race and ethnicity demographics were not available through CHARTS at the time of this report. Analyses of incidence by race and ethnicity are based on population figures using the Bureau of Census estimates (year 2000). Merlin® data provides the reported numbers of cases.

Frequency analysis. Analysis of risk factors and clinical characteristics is based on case reports in Merlin® that include information about symptoms and serologic test results for acute viral hepatitis. Data presented represent crude frequencies and are based on confirmed, probable, and suspect cases.

Data limitations. There is considerable variability by county in terms of both the sensitivity of reporting (that is, frequency of under-reporting) and the completeness of individual case reports. The degree of completeness of reporting can be influenced by a number of factors: diagnostic facilities available, control measures in effect,

awareness of a specific disease, and the interests, resources, and priorities of officials responsible for public health disease control and surveillance.¹ Information to assess the degree of under-reporting is not available.

According to the CDC, at least 85 percent of cases reported from Florida include extended case investigation data (e.g., clinical characteristics, exposure history).² Trend analyses in the characteristics of reported cases are based on records for which this information is complete.

An increasing number of reports are being made to health departments based on laboratory test results alone due to widespread use of laboratory testing and implementation of laboratory reporting requirements. Reports (in the case of infection with HBV or HCV) that are likely to represent cases of acute hepatitis cannot be distinguished, in many cases, from those representing chronic infection, previous infections, or false-positive test results because information about symptoms or additional serologic testing is not available. If a laboratory-based report cannot be classified as an acute case under the case definitions used, which include both clinical criteria and laboratory test results, the report is not included in the acute case database, but is included (if meeting the case definition) in the chronic HBV or HCV database.

References

1. CDC. Summary of Notifiable Diseases – United States, 2005. MMWR 2005; 52(54), 1-85.
2. CDC. Surveillance for Acute Viral Hepatitis – United States, 2006. MMWR 2008; 57 (No. SS-2).

Acute Hepatitis A

During 1995 through 2006, hepatitis A incidence in Florida declined 74% to the lowest rate ever recorded (1.2 cases per 100,000 population). In 2006, Florida reported 219 hepatitis A cases, which represent cases classified as *confirmed* or *probable*. This is a 77% decline from the 951 cases reported in 2002, when a central Florida county experienced a large community-wide outbreak associated with non-injecting drug use.¹

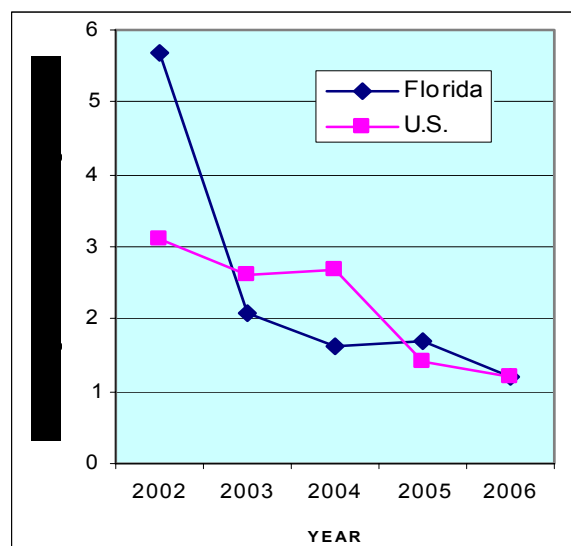
Since 1996, hepatitis A vaccine has been recommended nationally for individuals at increased risk of hepatitis infection. These include international travelers, men who have sex with men (MSM), injecting drug users (IDU) and non-injecting drug users.² In 1999, routine vaccination was recommended for children living in states with average hepatitis A rates during 1987-1997 that were at least 20 per 100,000 population.³ Vaccination was also suggested for children in several additional states where rates were less than 20 per 100,000 population, but above 10 per 100,000 population (the approximate national average for that period). During this period, hepatitis A case rates for Florida were below the national average, although some Florida areas reported rates above 10 per 100,000 population. Routine vaccination of all children in all 50 states was recommended in 2005 as a final step in the national strategy for the elimination of indigenous hepatitis A transmission.⁴

Current changes in hepatitis A rates suggest that these recommendations, as well as the state's ongoing comprehensive prevention efforts, are having an impact in reducing the transmission of the hepatitis A virus (HAV). The overall rate in 2006 is the lowest yet recorded nationally (**Figure 3**).

Additional surveys and surveillance are needed to determine if the current rates are sustainable and attributable to vaccination, as well as to identify groups and areas where additional vaccination efforts are needed.

Temporal Incidence. Historically, hepatitis A rates have varied cyclically with periodic statewide increases. In Florida, the rate of hepatitis A has declined steadily since the last major peaks, which occurred in 1989 and 2001, with incidence rates of 9.4 and 5.7 per 100,000, respectively. With 219 cases of hepatitis A reported for the year 2006, the statewide incidence (**Figure 3**) is now the lowest yet recorded (1.2 per 100,000).

Figure 3. Incidence of Hepatitis A, Florida and the U.S., 2002-2006



DATA SOURCE: Bureau of Epidemiology, Merlin® (2002-2006), FL DOH

Data represent reported cases (confirmed and probable case status)

U.S. Data: National Notifiable Diseases Surveillance System

POPULATION DATA: CHARTS, Office of Planning, Evaluation, and Data Analysis, FL DOH

Table 2. Reported Cases of Hepatitis A by Age, Sex, Race, and Ethnicity

YEAR	2002		2006	
	N=951		N=220	
Age	No.	%	No.	%
<5	36	3.8	11	5.0
5-9	79	8.3	37	16.8
10-14	51	5.4	23	10.5
15-19	42	4.4	15	6.8
20-29	203	21.3	33	15.0
30-39	218	22.9	26	11.8
40-49	162	17.0	19	8.6
50-59	83	8.7	18	8.2
60+	77	8.1	38	17.3
Sex				
Male	630	66.2	117	53.4
Female	321	33.8	102	46.6
Race/Ethnicity				
White, non-Hispanic	577	60.7	79	35.9
Black, non-Hispanic	19	2.0	14	6.4
Hispanic	213	22.4	114	51.8
American Indian or Alaskan native	0	0.0	0	0.0
Asian/Pacific Islander	9	0.9	6	2.7
Unknown	133	14.0	7	3.2

DATA SOURCE: Bureau of Epidemiology, Merlin® (2002-2006)
Data represent reported cases (confirmed and probable case status)

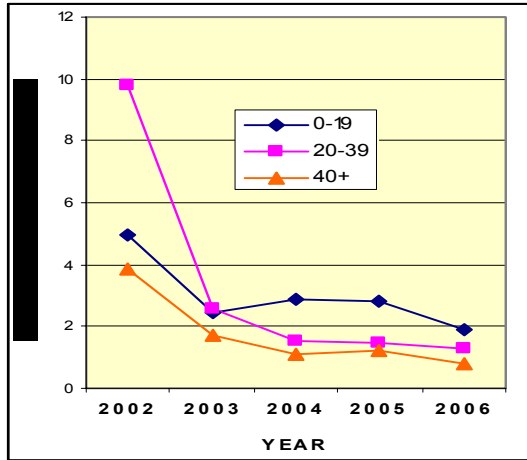
Geographical Incidence. In addition to temporal variation, hepatitis A rates have consistently varied geographically with higher rates in south and central Florida where many of the counties are home to persons most at risk, including large migrant populations and MSM. Historically, counties in north Florida have consistently reported disease rates below the state rate (data not shown).

Age. During 2002-2006, rates of hepatitis A have steadily declined among all age groups. The highest rates have historically been among children and young adults, with the lowest rates observed among persons greater than 40 years old. Incidence rates for acute hepatitis A remain higher in

persons less than 40 years of age (**Figure 4**). Age-specific rates during 2002 to 2006 (data not shown) were highest among children 5-14 years of age.

Data from the Third National Health and Nutrition Examination Survey (NHANES III) conducted during 1988-1994 indicate that approximately one-third of the United States (U.S.) population have serologic evidence of immunity to HAV.⁵ Hepatitis A rates among persons 40 years old and older have been low and relatively stable, reflecting the higher proportion of persons in this age group with immunity due to a previous infection.

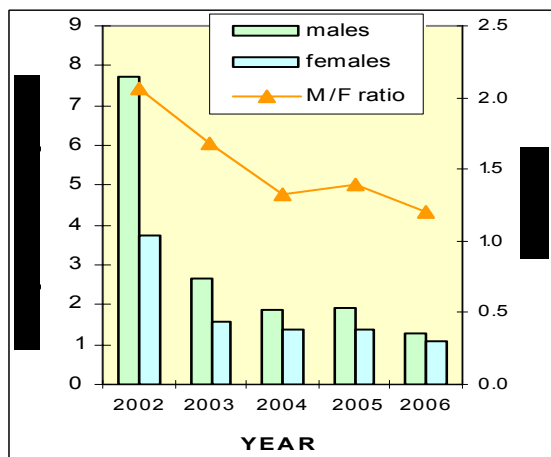
Figure 4. Incidence of Hepatitis A by Age Group, Florida, 2002-2006



DATA SOURCE: Bureau of Epidemiology, Merlin® (2002-2006), FL DOH
 Data represent reported cases (confirmed and probable)
 POPULATION DATA: CHARTS, Office of Planning, Evaluation, and Data Analysis, FL DOH

Gender. In 2006, the rate of hepatitis A among males in Florida was 1.3 versus 1.1 among females (per 100,000 persons).

Figure 5. Incidence of Hepatitis A by Gender and Male/Female Ratio, Florida, 2002- 2006



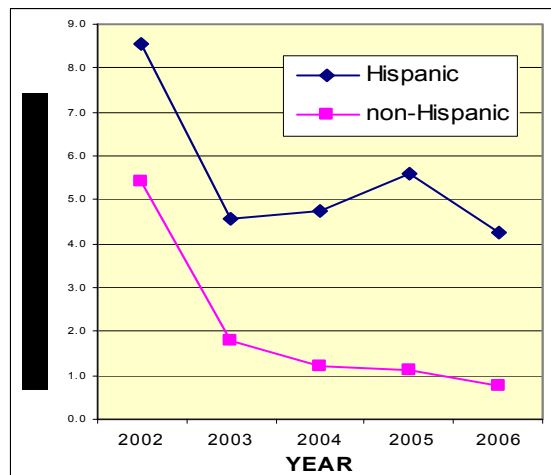
DATA SOURCE: Bureau of Epidemiology, Merlin® (2002-2006), FL DOH
 Data represent reported cases (confirmed and probable)
 POPULATION DATA: CHARTS, Office of Planning, Evaluation, and Data Analysis, FL DOH

Although rates have been historically higher in males than females, the ratio of male to female cases has been declining steadily, from 2.1 in 2002 to 1.2 in 2006 (Figure 5).

As in previous years, a higher proportion of cases occurred among males than females in 2006; however, for the age group 10-29 years the proportion of cases among males and females was nearly equal (data not shown).

Race and Ethnicity. Hepatitis A rates have differed historically by race/ethnicity, with the highest rates nationally among American Indians/Alaskan Natives and rates among Hispanics that were higher than among non-Hispanics. National rates among American Indians have dropped dramatically since the implementation of widespread routine hepatitis A vaccination in this group. For those reports in 2006 which included race and ethnicity information, the proportion of cases among Hispanics was higher than among non-Hispanics (Table 2).

Figure 6. Incidence of Hepatitis A by Ethnicity, Florida, 2002-2006



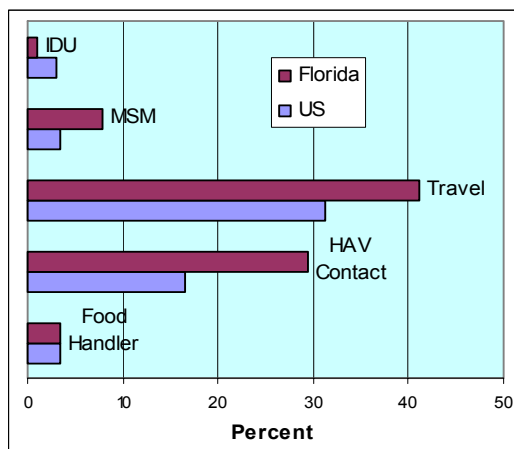
DATA SOURCE: Bureau of Epidemiology, Merlin® (2002-2006), FL DOH
 Data represent reported cases (confirmed and probable)
 POPULATION DATA: CHARTS, Office of Planning, Evaluation, and Data Analysis, FL DOH

In 2006, the incidence of acute hepatitis A among Hispanics was 5.5 times that of non-Hispanics (Figure 6). The proportion of cases among white non-Hispanics in 2002 was greater than that among Hispanics, but in

2006 the greater proportion is among Hispanics (**Table 2**).

Risk Factors. Among cases where information regarding exposures during the incubation period was available, the most frequently identified risk factor for hepatitis A in 2006 was international travel, followed by contact with another person with hepatitis A (**Figure 7**).

Figure 7. Proportion of Hepatitis A Cases by Risk Factor, Florida and the U.S., 2002-2006



DATA SOURCE: Bureau of Epidemiology, Merlin® (2002-2006), FL DOH
Data represent reported cases (confirmed and probable case status)

The epidemiology of hepatitis A in Florida changed in the mid-1990s from the highest rates occurring in children younger than 10 years old to the highest rates for 2002 among adult males 20-39 years old. This change is attributed to an increasing proportion of cases among adults in high-risk groups such as men who have sex with men (MSM). However, the proportion of cases in the MSM group for 2005-2006 is 8%, a dramatic decline from 32% in 2001. The proportion of cases attributed to travel outside the U.S. has increased over the five-year period from 22% in 2002 to 45% in 2006. In comparison, the proportion of cases attributed to other risk factors declined during the same period, and less than 2% of cases in 2006 were attributed to being

a child or employee in daycare, a previously significant risk factor.

Clinical Characteristics. During 2002 through 2006, 34% of cases were hospitalized because of their illness and nearly 1% reported a death (**Table 3**). Cases hospitalized for hepatitis increased with age from 15% among children younger than 5 years old to 50% among persons 60 years and older. The greatest number of deaths (7) occurred in persons 60 years and older, while the greatest number of persons hospitalized (397) occurred among persons 15 to 39 years of age.

Table 3. Clinical Characteristics of Patients with Hepatitis A by Age Group, Florida, 2002-2006

Characteristic	Age Group (years)				
	<5	5-19	20-39	40-59	60+
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Died from hepatitis	0 (0.0)	1 (0.2)	3 (0.4)	2 (0.4)	7 (2.9)
Hospitalized For hepatitis	16 (15.0)	150 (28.7)	247 (34.6)	161 (36.3)	123 (49.8)

A total of 2117 persons with hepatitis A, including the 13 who died, were reported. Percentages were calculated based on the number of case reports with data for the age group and the outcome of interest.

References

- Vong S, Fiore AE, Haight DO, et al. Vaccination in the county jail as a strategy to reach high risk adults during a community-based hepatitis A outbreak among methamphetamine drug users. *Vaccine*, 2005;23(8):1021-8.
- CDC. Prevention of hepatitis A through active or passive immunization. *MMWR Recomm Rep*. 1996;45(No. RR-15).
- CDC. Prevention of hepatitis A through active or passive immunization. *MMWR Recomm Rep*. 1999; 48(No. RR-12).
- CDC. Prevention of Hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep*. 2006;55(No. RR-7).
- Bell BP, Kruszon-Moran D, Shapiro CN, et al. Hepatitis A virus infection in the United States: serologic results from the Third National Health and Nutrition Examination Survey. *Vaccine*. 2005;23(50):5798-806.

Acute Hepatitis B

The incidence of infection with hepatitis B virus (HBV) has declined dramatically since the implementation of a comprehensive strategy to eliminate the disease in the U.S.¹ However, a need to strengthen efforts to reach specific populations with vaccine (that is, injection drug users, MSM, and persons with multiple sex partners) is indicated by the high proportion of cases occurring among persons in such identified risk groups. Through participating counties in Florida, hepatitis B vaccine is available at no cost for adults at increased risk for hepatitis infection or the serious consequences of infection. Integration of hepatitis programs and activities with HIV/AIDS, immunizations, STD, and correctional institutional settings has also been implemented through the county health departments, which offer hepatitis vaccine, testing, and educational services.

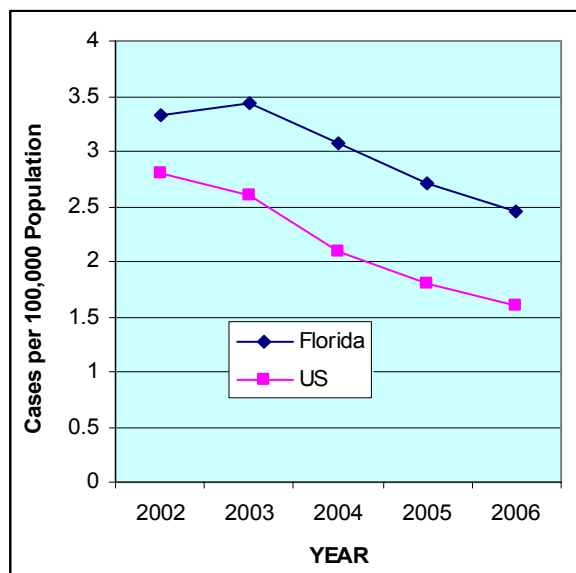
Expanding on an earlier (1984) recommendation for pregnant women at high-risk for hepatitis B, in 1988 the Advisory Committee on Immunization Practices (ACIP) issued a recommendation that all pregnant women be tested for hepatitis B surface antigen (HBsAg) early in each pregnancy, regardless of risk.² Florida law (Chapter 64D-3, F.A.C.) requires all pregnant women to be screened for HBV at their first prenatal exam, again in seven to eight months, and at delivery for women who present with no record of a previous blood test.

Infection with HBV is easily identifiable, and transmission during birth is highly preventable. Immunotherapy provided to infants of HBV-infected mothers, also mandated through Florida legislation, will prevent 97 percent of subsequent infections.

Temporal Incidence. In 2006, a total of 454 acute hepatitis B cases were reported statewide. The overall incidence rate (2.5 per 100,000 population) is the lowest ever recorded and represents a decline of 72% since 1985 and a decline of 13% since 2002.

A steady decline over the previous two decades follows the national trend. Florida's acute hepatitis B rate, however, remains above the national rate as shown in **Figure 8**.

Figure 8. Incidence of Acute Hepatitis B, Florida and the U.S., 2002-2006



DATA SOURCE: Bureau of Epidemiology, Merlin® (2002-2006), FL DOH

Data represent reported cases (confirmed, probable, and suspect case status)

POPULATION DATA: CHARTS, Office of Planning, Evaluation, and Data Analysis, FL DOH

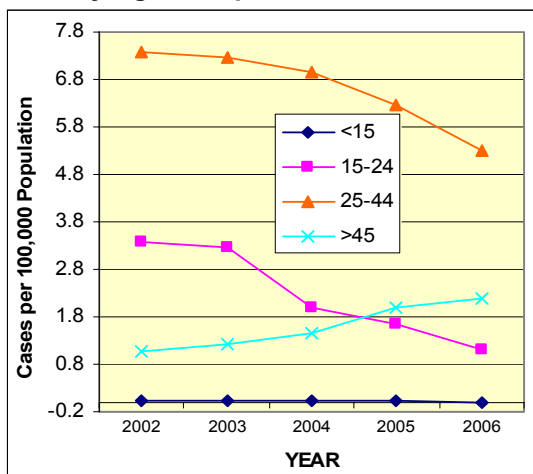
U.S. Data: CDC, NNDSS

Geographical Incidence. Hepatitis B rates during 2002-2006 have been similar for all regions, with rates only slightly higher in central Florida (data not shown). Pre-1997 rates were higher in the mostly rural north Florida counties, followed by counties in the central region. Overall, acute hepatitis B rates in all regions of Florida continue to decline.

Age. Hepatitis B rates in Florida vary by age and continue to decline in all age groups, although the greatest declines have occurred among the cohort of children to whom the recommendations for routine infant and adolescent vaccination have applied.

From 1997 through 2006, incidence among children aged <15 years declined over 97%, from 0.03 cases per 100,000 population to nearly zero cases per 100,000 population, correlating with high vaccine coverage rates among young children. Florida data indicate that vaccine coverage among children aged 2 years averaged 85% during the period 2002-2006.

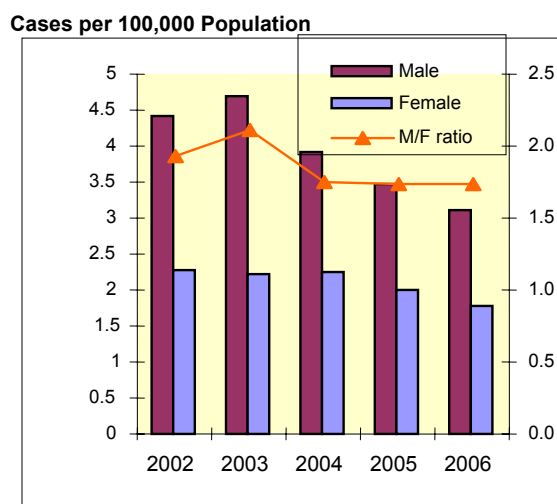
Figure 9. Incidence of Acute Hepatitis B by Age Group, Florida, 2002-2006



DATA SOURCE: Bureau of Epidemiology, Merlin® (2002-2006), FL DOH
 Data represent reported cases (confirmed, probable, and suspect case status)
 POPULATION DATA: CHARTS, Office of Planning, Evaluation, and Data Analysis, FL DOH

In 2006, the highest rates and proportion of cases in Florida are reported among persons 20-39 years old. Similar to national trends, the lowest rates are among persons younger than 15 years old. The decline over the last decade (1997-2006) among young adults 15-24 years old was 78% (data not shown). Less dramatic than the decline in the 15-24 year olds was a 37% decline in acute HBV rates among adults aged 25-44 years from 1997-2006 and a 28% decline from 2002-2006 (similar to trends for acute hepatitis B rates in the U.S.). Although incidence has declined among persons aged 25-44 years, rates in this age group, particularly among males, still remain substantially higher than in any other age group (**Figure 9**).

Figure 10. Incidence of Acute Hepatitis B by Gender and Male/Female Ratio, Florida, 2002-2006



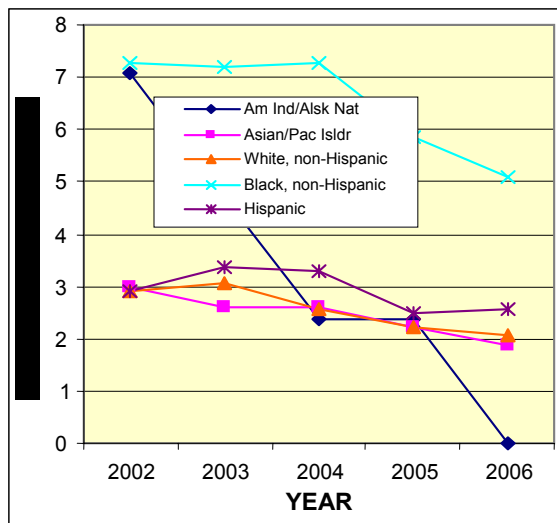
DATA SOURCE: Bureau of Epidemiology, Merlin® (2002-2006), FL DOH
 Data represent reported cases (confirmed, probable, and suspect case status)
 POPULATION DATA: CHARTS, Office of Planning, Evaluation, and Data Analysis, FL DOH

Gender. As in previous years, acute hepatitis B rates in males continue to be higher than in females; the 2002-2006, 5-year average ratio was 1.8. The ratio of cases occurring among males to that occurring among females in Florida remained stable from 2004-2006 (**Figure 10**) after a steady increase from 1998 to 2003.

Race and Ethnicity. Rates of acute hepatitis B continue to decline among all racial and ethnic groups, indicating progress in reducing racial/ethnic disparities in hepatitis B rates. A national downward trend in rates has been observed in the black non-Hispanic and American Indian/Alaskan Native populations during the last decade.

In Florida, rates of hepatitis B in 2006 remained highest among non-Hispanic blacks (5.1 per 100,000), more than two-fold higher than those among other racial/ethnic populations. Rates (per 100,000) are lowest among non-Hispanic whites (2.1), Asian/Pacific Islanders (1.9), and American Indians/Alaskan natives (0.0) (**Figure 11**).

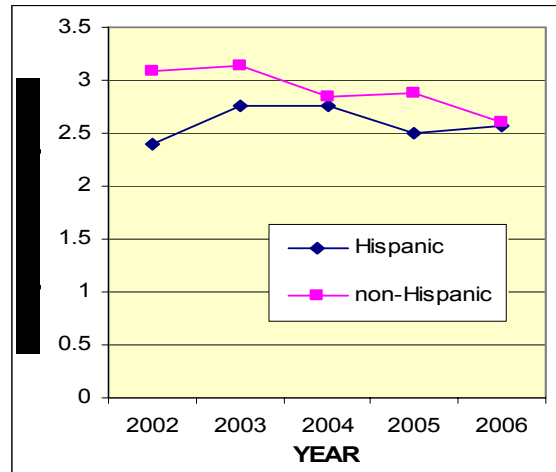
Figure 11. Incidence of Acute Hepatitis B by Race and Ethnicity, Florida, 2002-2006



DATA SOURCE: Bureau of Epidemiology, Merlin® (2002-2006), FL DOH
Data represent reported cases (confirmed, probable, and suspect case status)
POPULATION DATA: U.S. Census, 2000

Unlike hepatitis A, rates of acute hepatitis B among Hispanics have historically been lower than among either non-Hispanic whites or non-Hispanic blacks. In 2006, hepatitis B incidence for Hispanics (2.6 per 100,000) was the same as that of non-Hispanics (**Figure 12**).

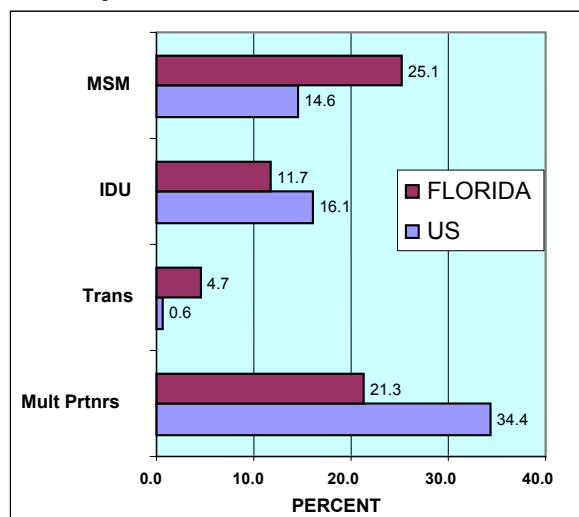
Figure 12. Incidence of Acute Hepatitis B by Ethnicity, Florida, 2002-2006



DATA SOURCE: Bureau of Epidemiology, Merlin® (2002-2006), FL DOH
Data represent reported cases (confirmed, probable, and suspect case status)
POPULATION DATA: U.S. Census, 2000

Risk Factors. Among cases for which information about exposures was reported during 2002-2006, approximately one-fourth were among those reporting as MSM (25%) and among those reporting multiple sex partners (21%).

Figure 13. Proportion of Acute Hepatitis B Cases by Risk Factor, Florida and U.S., 2006



DATA SOURCE: Bureau of Epidemiology, Merlin® (2002-2006), FL DOH
Data represent reported cases (confirmed, probable, and suspect case status)
US DATA: MMWR, 2008, Vol 57, No. SS-2

IDU was reported for 12% of persons (**Figure 13**); 30% were associated with ever having been incarcerated more than 24 hours and 17.5% with recent incarceration >24 hours; 21% were among persons who were ever treated for an STD; and 15% were associated with having had a tattoo (data not shown).

Previous major sources of infection (i.e., receiving blood transfusion or hemodialysis) are now reported for 5% or fewer cases (4.9% and 1.3%, respectively). Similarly, the proportion of cases reported for occupational exposure to blood has declined due to widespread hepatitis B vaccination among health-care workers.

Table 4. Reported Cases of Acute Hepatitis B by Age, Sex, Race, and Ethnicity

YEAR	2002		2006	
	N=559		N=454	
Age	No.	%	No.	%
<5	1	0.2	0	0.0
5-9	0	0.0	0	0.0
10-14	0	0.0	0	0.0
15-19	7	1.3	1	0.2
20-29	151	27.0	95	20.9
30-39	177	31.7	117	25.8
40-49	125	22.4	122	26.9
50-59	57	10.2	60	13.2
60+	41	7.3	59	13.0
Sex				
Male	362	64.8	283	62.3
Female	197	35.2	171	37.7
Race/Ethnicity				
White, non-Hispanic	239	42.8	217	47.9
Black, non-Hispanic	151	27.0	115	25.4
Hispanic	64	11.4	69	15.2
American Indian or Alaskan native	3	0.5	0	0.0
Asian/Pacific Islander	6	1.1	5	1.1
Unknown	96	17.2	47	10.4

DATA SOURCE: Bureau of Epidemiology, Merlin® (2002-2006) Data represent reported cases (confirmed, probable, and suspect)

Hepatitis B incidence among adults is expected to continue to decline due to vaccination among cohorts of persons who received vaccine in infancy, childhood, and adolescence. However, new strategies are needed to reach unvaccinated adults at risk for HBV infection. Vaccination services in settings such as STD and HIV testing and treatment facilities, drug abuse treatment

and prevention, and health care settings targeting services to IDUs and MSM are important venues for increasing vaccination coverage. Florida's local county health departments are already on the frontline of prevention and control through the state's comprehensive hepatitis prevention program.

Clinical Characteristics. Among reported acute hepatitis B cases with information for hospitalization and death during 2002-2006, 48% were hospitalized because of their illness and less than 1 percent died (**Table 5**). This is similar to U.S. data: 40% and 0.8%, respectively.

The proportion of cases hospitalized for hepatitis is greatest among persons younger than 5 years of age (67%), followed by those 60 and older (55%). Deaths occurred in the age groups above 19 years of age with the greatest number occurring among persons 40 years of age and older.

Table 5. Clinical Characteristics of Patients with Acute Hepatitis B by Age Group, Florida, 2002-2006

Characteristic	Age Group (years)				
	<5 No. (%)	5-19 No. (%)	20-39 No. (%)	40-59 No. (%)	60+ No. (%)
Died from hepatitis	0 (0.0)	0 (0.0)	4 (0.3)	8 (0.9)	7 (3.1)
Hospitalized for hepatitis	2 (66.7)	7 (28.0)	614 (36.9)	259 (50.1)	128 (55.2)

A total of 2468 persons with acute hepatitis B, including the 19 who died, were reported. Percentages were calculated based on the number of case reports with data for the age group and the outcome of interest.

Table 6. Reported Cases of Chronic Hepatitis B by Age, Sex, and Race/Ethnicity, 2002-2006

Age Group	YEAR				
	2002 # (%)	2003 # (%)	2004 # (%)	2005 # (%)	2006 # (%)
0-19	92 (6.0)	168 (4.7)	152 (4.4)	86 (3.2)	93 (3.1)
20-29	218 (14.2)	528 (14.7)	502 (14.7)	367 (13.8)	700 (13.4)
30-39	387 (25.3)	878 (24.45)	817 (23.9)	624 (23.4)	723 (24.2)
40-49	392 (25.6)	972 (27.0)	925 (27.1)	699 (26.2)	826 (27.6)
50+	442 (28.9)	1055 (29.3)	1020 (29.9)	890 (33.4)	950 (31.8)
Sex					
Male	926 (60.5)	2252 (62.5)	2110 (61.8)	1733 (65.0)	1827 (61.1)
Female	590 (38.5)	1292 (35.9)	1288 (37.7)	925 (34.7)	1151 (38.5)
Race					
non-Hisp White	293 (19.2)	545 (15.1)	550 (16.1)	453 (17.0)	536 (17.9)
non-Hisp Black	345 (22.7)	656 (18.2)	627 (18.4)	591 (22.1)	661 (22.1)
non-Hisp Other	148 (9.7)	301 (8.4)	310 (9.1)	308 (11.5)	322 (10.8)
non-Hisp Unknown	58 (3.8)	91 (2.5)	116 (3.4)	76 (2.8)	77 (2.6)
Ethnicity					
Hispanic	109 (7.1)	265 (7.4)	283 (8.3)	215 (8.0)	327 (10.9)
non-Hisp ethnicity	844 (55.1)	1593 (44.2)	1603 (46.9)	1428 (53.4)	1596 (53.3)
Unknown	578 (37.8)	1741 (48.4)	1530 (44.8)	1029 (38.5)	1069 (35.7)

DATA SOURCE: Bureau of Epidemiology,

Chronic Hepatitis B. The burden of HBV infection in Florida cannot be completely described with acute disease surveillance data alone. A national seroprevalence survey report indicated that approximately 1.3 million persons in the U.S. are living with chronic HBV infection.³ While the true number of persons in Florida with this disease is unknown; Florida is tracking chronic hepatitis B infection.

During the period 2002-2005, 14,206 cases of chronic HBV were reported to the state. Florida data indicate a higher prevalence of HBV for persons 50 years old and older; male gender; white race; and non-Hispanic ethnicity (**Table 6**). All demographic data are not reported (i.e., race and ethnicity), therefore, the large proportion of “unknown” for these characteristics. Data represent reported cases (confirmed, probable, and suspect case status).

REFERENCES:

1. CDC. A Comprehensive Immunization Strategy to Eliminate Transmission of Hepatitis B Virus Infection in the United States. (ACIP). *MMWR Recomm Rep.* 2006;55(No. RR-16).
2. CDC. Recommendations of the Immunization Practices Advisory Committee Prevention of Perinatal Transmission of Hepatitis B Virus: Prenatal Screening of all Pregnant Women for Hepatitis B Surface Antigen. *MMWR Recomm Rep.* 1988, 22(No. RR-37).
3. Margolis HS, Coleman PJ, Brown RE, et al. Prevention of hepatitis B virus transmission by immunization: An economic analysis of current recommendations *JAMA* 1995; 274(15): 1201-1208.

Acute Hepatitis C

The hepatitis C viral infection is the most common chronic, blood-borne infection in the United States, with an estimated 4 to 5 million persons infected, and 2.7 million of these are chronically infected. Unlike hepatitis A and hepatitis B, there is no effective vaccine against hepatitis C virus (HCV). National recommendations addressing specific primary prevention activities to reduce viral transmission risk were issued in 1998 for the prevention and control of HCV.

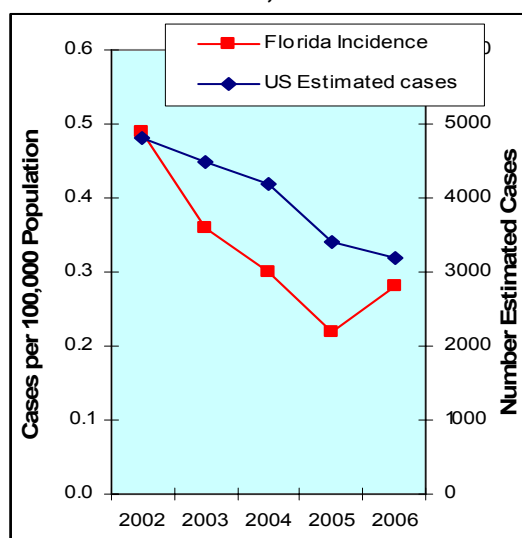
Since the late 1980's, the incidence of acute disease has been declining. The majority of cases continue to occur in adult age groups (persons older than age 25) with injecting drug use the most commonly identified risk factor for infection.¹ Continual decline of newly reported cases is expected due to the impact of ongoing prevention programs.

The actual number of individuals in Florida with either acute or chronic hepatitis C is unknown. Fifty-one cases of acute HCV were reported to the state in 2006. This is a 27% increase in incidence from 2005 and a 43% decrease from 2002 (**Figure 14**).

Confirming an acute hepatitis C case requires considerable effort on the part of reporting sources. Many acute cases are most likely missed because they go unrecognized or fall outside the reporting criteria. While reporting criteria for acute disease appear clear-cut, there are many challenges affecting accurate reporting. Laboratory tests for HCV do not distinguish among acute, chronic, or past infections. Since an estimated 60-70% of persons who contract the virus have no distinct symptoms, the infection may go undiagnosed.

Temporal Incidence. The rate of reported hepatitis C cases in Florida in 2006 is 0.28 per 100,000 population, with 51 cases reported statewide (**Figure 14**). The 2002-2006, five-year average case rate was 0.32 per 100,000 population.

Figure 14. Acute Hepatitis C Cases by Florida Incidence and U.S. Estimated Number, 2002-2006



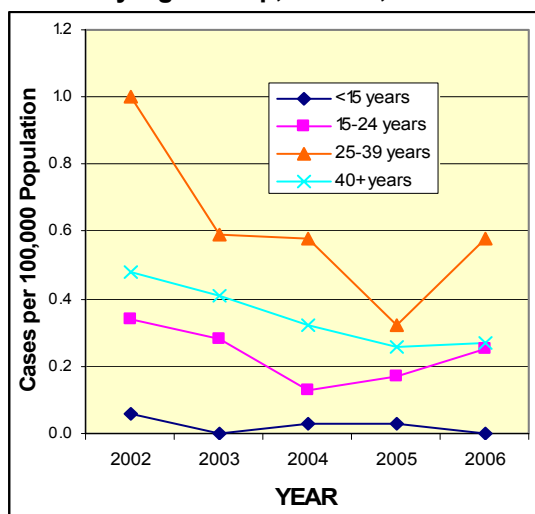
DATA SOURCE: Bureau of Epidemiology, (2002-2006), FL DOH; CDC, Hepatitis Surveillance Data represent reported cases (confirmed, probable, and suspect case status)
POPULATION DATA: CHARTS, Office of Planning, Evaluation, and Data Analysis, FL DOH

Following national trends, rates for acute hepatitis C infection in Florida have been declining since 1985 when the highest rate (3.1), representing 356 cases, was recorded.

Geographical Incidence. Historically, acute HCV rates have varied throughout the regions of the state. In 2006, 23 of Florida's 67 counties reported one or more cases of acute disease compared to reports from 26 counties in 2002.

Age. Acute hepatitis C rates have been declining in all age groups since the mid-nineties, with the greatest decline seen among persons aged 25-39 years, the age group that historically has had the highest rates of infection. Among this age group, incidence in 2005 declined 68% since 2002, but increased again in 2006 (Figure 15). Few cases are reported in persons younger than 15 years old (Table 7), similar to national data.

Figure 15. Incidence of Acute Hepatitis C by Age Group, Florida, 2002-2006

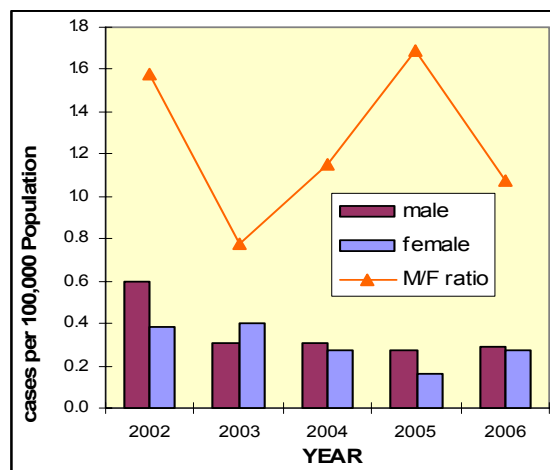


DATA SOURCE: Bureau of Epidemiology, (2002-2006), FL DOH
 Data represent reported cases (confirmed, probable, and suspect case status)
 POPULATION DATA: CHARTS, Office of Planning, Evaluation, and Data Analysis, FL DOH

Gender. As in previous years, the rate of acute hepatitis C was higher for males (0.29 per 100,000 population) than for females (0.27 per 100,000 population). However, this rate differential has varied over the 2002-2006 period, with the ratio ranging from 0.8 to 1.7 (Figure 15). In 2003 and in 2006, the male-to-female ratio was the smallest since 1998.

During 2002-2006, males accounted for 152 (54%) reported cases and females for 131 (46%) (Table 7). Historically, males have accounted for the greatest proportion of cases.

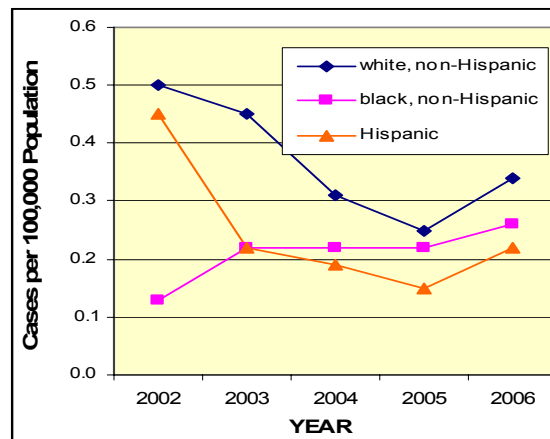
Figure 16. Incidence of Acute Hepatitis C by Gender and M/F Ratio, Florida, 2002-2006



DATA SOURCE: Bureau of Epidemiology, (2002-2006), FL DOH
 Data represent reported cases (confirmed, probable, and suspect case status)
 POPULATION DATA: CHARTS, Office of Planning, Evaluation, and Data Analysis, FL DOH

Race and Ethnicity. Incidence of acute hepatitis C has declined in all racial populations. In 2006, rates were similar across racial/ethnic populations. However, white, non-Hispanics continue to have the highest incidence (Figure 17).

Figure 17. Incidence of Acute Hepatitis C by Race/Ethnicity, Florida, 2002-2006



DATA SOURCE: Bureau of Epidemiology, (2002-2006), FL DOH
 Data represent reported cases (confirmed, probable, and suspect case status)
 POPULATION DATA: CHARTS, Office of Planning, Evaluation, and Data Analysis, FL DOH

Table 7. Reported Cases of Acute Hepatitis C by Age, Sex, Race and Ethnicity, 2002-2006

YEAR	2002-2006	
	N=283	
Age	No.	%
<5	3	1.1
5-9	2	0.7
10-14	0	0.0
15-19	9	3.2
20-29	48	17.0
30-39	76	26.9
40-49	88	31.1
50-59	38	13.4
60+	19	6.7
Sex		
Male	152	53.7
Female	131	46.3
Race/Ethnicity		
White, non-Hispanic	180	63.6
Black, non-Hispanic	24	8.5
Hispanic	33	11.7
American Indian or Alaskan native	0	0.0
Asian/Pacific Island	2	0.7
Unknown	44	15.5

DATA SOURCE: Bureau of Epidemiology, (2002-2006)

Data represent reported cases (confirmed, probable, and suspect case status)

Risk Factors. Of the cases reported in 2002-2006 for which information concerning exposures was available, the two most common risk factors identified were IDU and sexual contact with another known HCV-infected person, followed by multiple sex partners (**Table 8**).

Table 8. Proportion of Acute Hepatitis C Cases by Risk Factor, Florida, 2002-2006

Risk	CASES	
	number [†]	%
IDU	67	33.0
Multiple sex partners	41	27.9
Sexual contact with HCV+	54	33.1
Surgery, oral	32	16.1
Surgery, other	26	12.9

DATA SOURCE: Bureau of Epidemiology, (2002-2006)

Data represent reported cases (confirmed, probable, and suspect case status)

[†] Crude frequencies

Clinical Characteristics. During 2002-2006 in Florida, of persons reported with acute hepatitis C, 2 (0.7%) died and 161 (55%) were hospitalized. The two deaths occurred in individuals aged 50-59 years. The majority of hospitalized cases occurred in individuals aged 30-49 years (data not shown).

REFERENCES

1. CDC. Surveillance for Acute Viral Hepatitis – United States, 2006. *MMWR, Surveillance Summaries*, 2008; 57(SS-02).

Chronic Hepatitis C. Due to an unprecedented increase in the spread of HCV during the 20th century, a substantial burden of HCV disease exists because of chronic infection. The widespread availability of injectable therapies and the illicit use of injectable drugs are thought to be responsible for the increase in HCV-related morbidity and mortality.¹

An estimated 4 million Americans, including approximately 300,000 Floridians are

infected with HCV. Because they are not clinically ill, most of these persons are unaware of their infection. Of these chronically infected persons, 70-80% will develop chronic liver disease with an increased risk for development of cirrhosis and liver cancer.

During 2002-2006, a total of 98,049 cases were reported to the state. The demographic profile of cases for this period is presented in **Table 9** below.

Table 9. Reported Cases of Chronic Hepatitis C by Age, Sex, Race, and Ethnicity, Florida, 2002-2006

Age Group	YEAR				
	2002	2003	2004	2005	2006
	# (%)	# (%)	# (%)	# (%)	# (%)
0-19	153 (1.3)	303 (1.4)	370 (1.5)	256 (1.3)	272 (1.4)
20-29	461 (3.8)	876 (4.1)	1128 (4.7)	1031 (5.0)	1253 (6.3)
30-39	1565 (12.9)	2743 (12.7)	2722 (11.4)	2182 (10.7)	2017 (10.1)
40-49	5100 (41.9)	8687 (40.4)	9296 (38.8)	7113 (34.8)	6552 (32.8)
50+	4895 (40.2)	8920 (41.4)	10,445 (43.6)	9844 (48.2)	9865 (49.4)
Sex					
Male	7268 (59.7)	13,097 (60.8)	14,669 (61.2)	12,589 (61.6)	12,099 (60.6)
Female	4791 (39.4)	8257 (38.4)	9239 (38.6)	7,802 (38.2)	7,808 (39.1)
Race					
non-Hisp White	2222 (18.3)	5267 (24.5)	5654 (23.6)	4911 (24.0)	5800 (29.1)
non-Hisp Black	684 (5.6)	1432 (6.7)	1645 (6.9)	1340 (6.6)	1463 (7.3)
Ethnicity					
Hispanic	925 (7.6)	1947 (9.0)	1964 (8.2)	1811 (8.9)	1712 (8.6)
non-Hisp	3550 (29.2)	8215 (38.2)	8826 (36.8)	7683 (37.6)	8439 (42.3)
Ethnicity Unknown	7650 (62.8)	11,357 (52.8)	13,171 (55.0)	10,932 (53.5)	9807 (49.1)

DATA SOURCE: Bureau of Epidemiology,
% = percent of total cases

The HCV chronically infected individual is most often a non-Hispanic male aged 40-49 years (**Table 9**). Males accounted for the majority (61%) of cases during 2002-2006 and the 40-49 year age group represented 37% of cases.

Although non-Hispanics accounted for the greatest number of cases with ethnicity reported, over one-half (54%) of these cases lacked data for this group.

REFERENCES

1. Shepard CW, Finelli L, Alter MJ. Global epidemiology of hepatitis C virus infection. *Lancet Infect Dis.* 2005;(9):558-67.

Conclusion

Multiple key public health objectives are accomplished through on-going surveillance for acute viral hepatitis: outbreak detection, contact identification for needed post-exposure prophylaxis, risk factor identification, and disease trend analysis. Surveillance for acute viral hepatitis requires, at a minimum, laboratory confirmation to distinguish viral types and clinical information to verify a case definition. Risk factor and exposure data provide needed information regarding transmission modes and ultimately contribute toward the development and evaluation of prevention strategies. Surveillance for chronic hepatitis infections is valuable in characterizing the burden of chronic disease present in Florida.