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HEPATITIS

SURVEILLANCE

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Preface

Hepatitis Surveillance, No. 59 presents statistics and trends in viral hepatitis in the United States through 2002. This publication, which summarizes viral hepatitis case reports received from state health departments, is intended as a reference document for policy makers, program managers, health planners, researchers and others who are concerned with the public health implications of these diseases. Any comments and suggestions that would improve the usefulness of future publications are appreciated and should be sent to Chief, Surveillance Team, Division of Viral Hepatitis, Centers for Disease Control and Prevention, 1600 Clifton Road, Mailstop G37, Atlanta, GA 30333.

Acknowledgments

Publication of this report would not have been possible without the contributions of the State and Territorial Health Departments that provide state and local surveillance data to the Centers for Disease Control and Prevention.

This report was prepared by the following staff members of the Surveillance Team of the Epidemiology Branch of the Division of Viral Hepatitis, National Center for Infectious Diseases: Annemarie Wasley, Jeremy Miller, and Lyn Finelli.

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Conditions under surveillance

National surveillance is conducted for acute hepatitis A, acute hepatitis B, acute hepatitis C and acute non-A, non-B hepatitis (NANB). Case definitions for these conditions are below. Nationwide reporting of perinatal HBV infection was implemented in 2001. In addition, chronic hepatitis B virus (HBV) infection and hepatitis C virus (HCV) infection, past or present were added to the list of nationally notifiable conditions in January 2003. This publication summarizes information received about reported cases of acute disease.

Sources of data

Cases of acute hepatitis are reported to CDC by state and territorial health departments on a weekly basis via the National Notifiable Diseases Surveillance System (NNDSS). As of January 1, 2002, all reports are received electronically by CDC via NETSS (National Electronic Telecommunications System for Surveillance). However, for the period covered by this report, states could report data using hard-copy forms or by electronic means. The data used in this report are based on a combination of aggregated NETSS data and summary hardcopy reports received for the years 1990 through 2001.

Participation by states in the reporting of viral hepatitis cases to CDC is voluntary as it is for all nationally notifiable diseases. Currently, all states collect and report basic information (event date, source of report, demographic characteristics) about cases of acute viral hepatitis that are identified in their states. States are also asked to report additional information (laboratory test results, clinical information and exposure history) about investigated cases. Completeness of reporting of these additional data varies among and within states. Currently, approximately 30% of case reports received by CDC include extended data. See Table 1 for information on state-specific reporting profiles.

Analyses

Incidence rate calculations

Crude incidence rates of new cases were calculated on an annual basis per 100,000 population using Bureau of the Census estimates of the U.S. resident population.

Frequency analysis

Analyses of risk factors and clinical characteristics were based on case reports that included information on symptoms and serologic test results to verify the presence of acute viral hepatitis. For individuals who report more than one risk factor, the assignment of a source of infection is based on a hierarchy of mutually exclusive categories that represents the relative efficiency of transmission by various routes. For example, based on the hierarchy used for hepatitis B risk factors, a case in which the individual's reported exposures during the incubation period included injecting illegal drugs and having had multiple sex partners would be attributed to injection drug use. In the tables summarizing the analysis of mutually exclusive risk factors, the risk factors are listed according to their order in the hierarchy specific for that disease. For comparison, the crude frequencies of reported risk factors are included in separate tables.

Table 1: Proportion of Reported Cases That Included Risk Factor Data, by State, 2002

81%-100%	61% - 80%	41-60%	11-40%	0-10%
Alabama	Arkansas	Michigan	Arizona	Alaska
D.C.	Colorado	Ohio	Connecticut	California
Hawaii	Florida	Virginia	Illinois	Delaware
Kansas	Indiana		Louisiana	Georgia
Maine	Iowa		Massachusetts	Idaho
Maryland	Kentucky		Missouri	Mississippi
Minnesota	Montana		Nebraska	New Hampshire
Nevada	Utah		New Mexico	New Jersey
New York	Wyoming		North Dakota	New York City
North Carolina			South Carolina	Oregon
Oklahoma				Tennessee
Pennsylvania				Texas
Rhode Island				
South Dakota				
Vermont				
Washington				
West Virginia				
Wisconsin				

Data Limitations

There is considerable variability by state in terms of both the sensitivity of reporting (i.e. frequency of underreporting) and the completeness of individual case reports. Information to assess the degree of underreporting is not available. Only 30% of cases are reported with extended case investigation data (e.g., clinical characteristics, exposure history) and this percentage varies by state from 0 to 100% (see Table 1). Analyses of trends in the characteristics of reported cases are based on records for which this information is complete; it is not known if or how cases that are reported with complete data differ from those for which data are missing or from those that are not reported.

As a result of widespread use of laboratory testing and implementation of laboratory reporting requirements, an increasing number of reports are being made to health departments on the basis of a laboratory test result alone. For many of these cases, information about symptoms or additional serologic testing is not available to distinguish case reports that are likely to represent cases of acute hepatitis from those representing chronic infection (in the case of infection with HBV or HCV), previous infections or false positive test results. To minimize the effect of including misclassified cases on assessments of epidemiologic trends, analysis of clinical characteristics and risk factors were restricted to those reports that included sufficient information to verify that the cases meet the definition for acute disease.

Case definitions

Reported cases must meet the clinical criteria and be serologically confirmed.

Clinical case definition

An acute illness with a) discrete onset of symptoms and b) jaundice or elevated serum aminotransferase levels

Laboratory criteria for diagnosis:

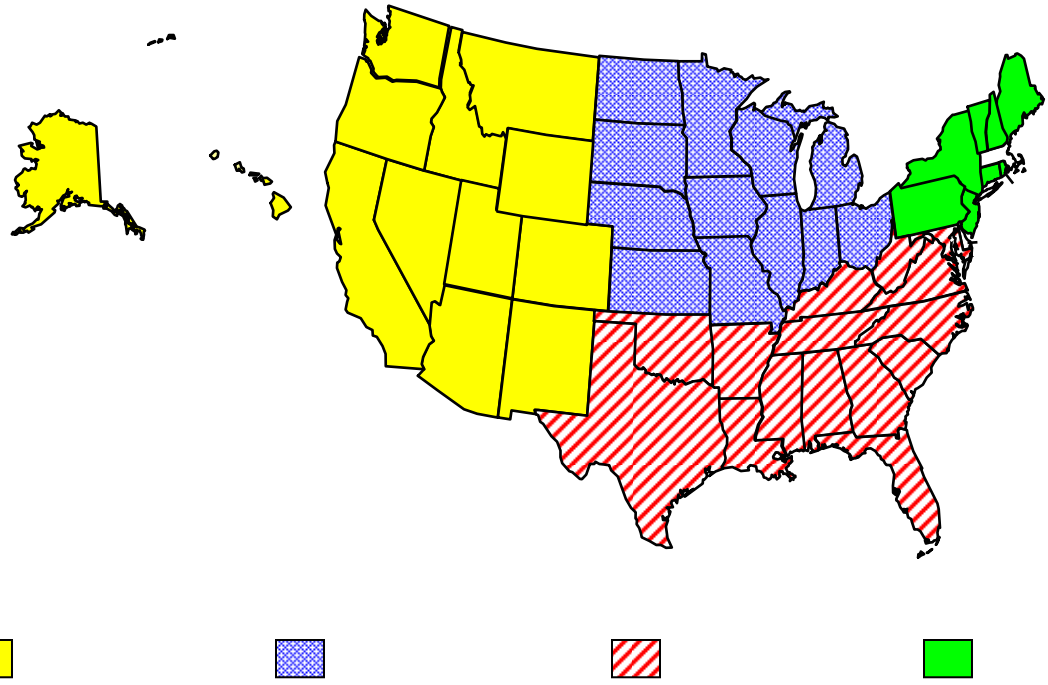
- *Hepatitis A*:
    - Immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV) positive

- *Hepatitis B*:
    - IgM antibody to hepatitis B core antigen (anti-HBc) positive or hepatitis B surface antigen (HBsAg) positive
    - IgM anti-HAV negative (if done)
- *Hepatitis C*:
    - Serum alanine aminotransferase levels greater than 7 times the upper limit of normal, and
    - IgM anti-HAV negative, and
    - IgM anti-HBc negative or if not done, HBsAg negative, and
    - One of the following:
        - Antibody to hepatitis C virus (anti-HCV) screening-test-positive, verified by an additional more specific assay (e.g. RIBA for anti-HCV or nucleic acid testing for HCV RNA) OR
        - Anti-HCV screening-test-positive with a signal to cut-off ratio predictive of a true positive as determined for the particular assay (e.g., >3.8 for the enzyme immunoassays).
- *Non-A, Non-B hepatitis*:
    - Serum aminotransferase levels greater than 2.5 times the upper limit of normal, and
    - IgM anti-HAV negative, and
    - IgM anti-HBc negative (if done) or HBsAg negative, and
    - Anti-HCV negative (if done)

Case classification

Confirmed: a case that meets the clinical case definition and is laboratory confirmed or, for hepatitis A, a case that meets the clinical case definition and occurs in a person who has an epidemiologic link with a person who has laboratory-confirmed hepatitis A (i.e., household or sexual contact with an infected person during the 15-50 days before the onset of symptoms)

Figure 1. Geographic Divisions of the United States



West	Midwest	South	Northeast
Alaska	Illinois	Alabama	Connecticut
Arizona	Indiana	Arkansas	Maine
California	Iowa	Delaware	Massachusetts
Colorado	Kansas	District of Columbia	New Hampshire
Hawaii	Michigan	Florida	New Jersey
Idaho	Minnesota	Georgia	New York
Montana	Missouri	Kentucky	Pennsylvania
Nevada	Nebraska	Louisiana	Rhode Island
New Mexico	North Dakota	Maryland	Vermont
Oregon	Ohio	Mississippi	
Utah	South Dakota	North Carolina	
Washington	Wisconsin	Oklahoma	
Wyoming		South Carolina	
		Tennessee	
		Texas	
		Virginia	
		West Virginia	

Figure 2: Incidence of reported viral hepatitis, United States, 1966-2002

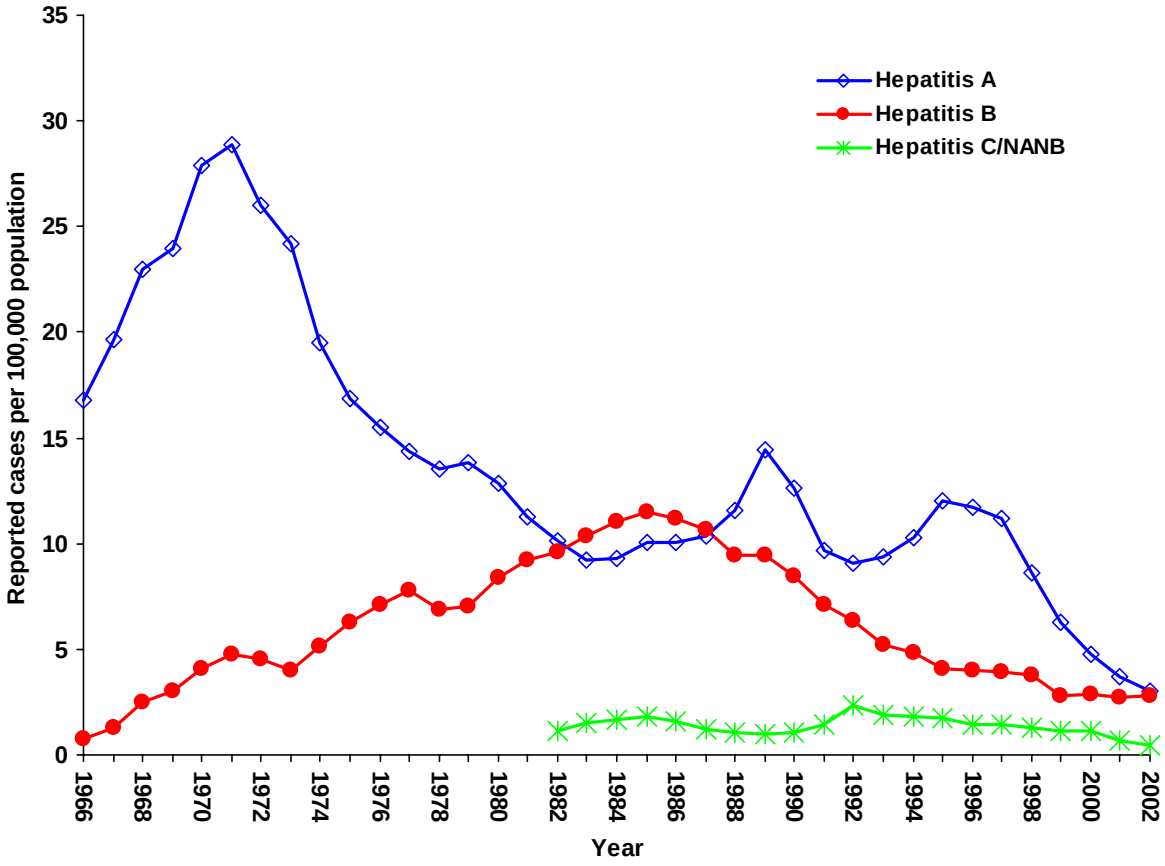


Table 2: Reported cases of acute viral hepatitis, by type and year, United States, 1966-2002

	Hepatitis A		Hepatitis B		Hepatitis C/NANB	
Year	No.	Rate**	No.	Rate	No.	Rate
1966	32,859	16.8	1,497	0.8	***	***
1967	38,909	19.7	2,458	1.3	***	***
1968	45,893	23.0	4,829	2.5	***	***
1969	48,416	24.0	5,909	3.0	***	***
1970	56,797	27.9	8,310	4.1	***	***
1971	59,606	28.9	9,556	4.7	***	***
1972	54,074	26.0	9,402	4.5	***	***
1973	50,749	24.2	8,451	4.0	***	***
1974	40,358	19.5	10,631	5.2	***	***
1975	35,855	16.8	13,121	6.3	***	***
1976	33,288	15.5	14,973	7.1	***	***
1977	31,153	14.4	16,831	7.8	***	***
1978	29,500	13.5	15,016	6.9	***	***
1979	30,407	13.8	15,452	7.0	***	***
1980	29,087	12.8	19,015	8.4	***	***
1981	25,802	11.3	21,152	9.2	***	***
1982	23,403	10.1	22,177	9.6	2,629***	1.1
1983	21,532	9.2	24,318	10.4	3,470*	1.5
1984	22,040	9.3	26,115	11.1	3,871*	1.6
1985†	23,257	10.0	26,654	11.5	4,192*	1.8
1986†	23,430	10.0	26,107	11.2	3,634*	1.6
1987	25,280	10.4	25,916	10.7	2,999*	1.2
1988	28,507	11.6	23,177	9.4	2,619*	1.1
1989	35,821	14.4	23,419	9.4	2,529*	1.0
1990	31,441	12.6	21,102	8.5	2,553*	1.0
1991	24,378	9.7	18,003	7.1	3,582*	1.4
1992	23,112	9.1	16,126	6.3	6,010	2.4
1993	24,238	9.4	13,361	5.2	4,786	1.9
1994	26,796	10.3	12,517	4.8	4,470	1.8
1995	31,582	12.0	10,805	4.1	4,576	1.7
1996	31,032	11.7	10,637	4.0	3,716	1.4
1997	30,021	11.2	10,416	3.9	3,816	1.4
1998	23,229	8.6	10,258	3.8	3,518	1.3
1999	17,047	6.3	7,694	2.8	3,111	1.1
2000	13,397	4.8	8,036	2.9	3,197	1.1
2001	10,615	3.7	7,844	2.8	1,640 ‡	0.7‡
2002	8,795	3.1	8,064	2.8	1,223 ¥	0.5¥

Source: National Notifiable Diseases Surveillance System

* **Numbers and rates shown for hepatitis C/ Non-A, non-B hepatitis are unreliable -.**

** **Rate per 100,000 population.** *** **Not reported until 1982.** † **Excludes cases from New York City; data not available for 1985 or 1986.**‡ **Excludes cases from New Jersey and Missouri.** ¥ **Excludes cases from Missouri**

Table 3: Incidence of reported acute viral hepatitis, by type, state and year, United States

Hepatitis A (cases per 100,000 persons)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Alabama	2.4	1.1	1.3	1.4	3.3	2.2	5.1	2.0	1.9	1.4	1.3	1.8	0.9
Alaska	34.4	16.9	22.2	129.8	34.8	8.3	8.9	5.6	2.8	2.4	2.1	2.5	1.9
Arizona	53.8	29.7	31.7	37.4	52.1	31.6	39.9	51.2	39.5	14.6	9.0	7.7	5.6
Arkansas	25.7	10.9	6.5	3.1	10.3	26.7	20.0	8.8	3.2	3.2	5.4	2.7	2.7
California	21.4	16.5	16.0	18.2	21.1	21.5	20.9	20.0	12.8	10.4	8.8	5.3	4.1
Colorado	10.7	20.2	25.5	24.6	16.0	13.6	13.4	10.3	8.7	5.4	5.2	2.0	1.6
Connecticut	4.2	3.8	2.5	3.6	3.0	2.6	4.3	4.6	3.0	3.9	5.2	7.0	2.7
Delaware	14.3	1.9	8.1	1.7	3.1	1.7	2.9	4.2	0.8	0.3	1.9	2.0	1.9
District of Columbia	6.5	13.0	2.9	1.9	4.8	4.7	7.2	6.8	12.6	11.4	7.0	13.9	14.2
Florida	5.2	6.4	4.3	5.1	5.6	4.7	5.1	5.5	4.1	5.7	4.1	5.2	6.3
Georgia	5.8	3.7	3.4	2.1	0.6	1.2	5.6	10.2	11.5	6.2	4.6	11.1	5.9
Hawaii	9.5	7.9	14.9	5.9	4.9	14.0	10.1	12.4	4.5	2.0	1.1	1.4	2.0
Idaho	9.5	9.5	12.8	27.1	33.5	30.3	20.8	12.4	19.1	3.8	3.5	4.3	2.3
Illinois	15.1	12.2	6.7	8.7	5.2	5.6	6.4	7.2	6.8	7.0	5.6	3.5	2.1
Indiana	4.6	8.9	14.1	11.3	6.3	3.3	6.3	5.6	2.9	1.8	2.2	1.7	0.8
Iowa	10.1	1.7	1.9	2.1	2.3	3.8	11.7	17.2	14.0	5.6	2.3	1.2	2.2
Kansas	10.9	3.6	5.6	3.1	4.3	6.3	15.2	10.1	4.1	2.5	4.1	6.7	2.6
Kentucky	2.5	1.9	3.7	3.7	5.8	1.1	1.4	2.0	0.8	1.7	1.6	3.6	1.1
Louisiana	5.3	3.5	5.5	2.5	3.9	4.5	6.0	6.1	4.0	4.9	2.4	1.9	2.0
Maine	0.9	1.7	2.3	1.1	2.0	2.4	2.3	5.3	1.6	2.2	1.7	0.9	0.6
Maryland	19.8	5.6	5.2	3.2	4.0	4.4	5.1	3.7	8.1	5.9	4.0	5.5	5.5
Massachusetts	6.6	4.8	4.9	3.5	1.9	2.7	3.8	4.2	2.0	2.3	2.2	5.9	2.2
Michigan	4.1	3.1	1.6	2.2	3.7	3.8	5.2	14.0	21.7	12.7	4.9	3.3	2.2
Minnesota	7.4	10.9	19.8	11.0	5.7	4.3	3.8	5.2	3.1	2.7	3.7	0.9	1.1
Mississippi	1.8	1.3	1.6	2.3	2.9	8.3	8.3	3.5	2.5	4.6	5.0	1.3	2.2
Missouri	12.1	12.7	28.9	27.5	11.7	25.1	26.3	21.3	11.7	13.0	4.6	1.6	1.5
Montana	19.9	10.2	10.6	9.2	2.9	19.9	14.8	8.1	10.9	2.0	0.8	1.8	1.4
Nebraska	6.6	15.5	16.6	12.1	7.5	4.0	9.5	6.8	1.6	3.2	2.2	2.2	1.1
Nevada	26.3	24.2	8.3	12.6	17.4	21.9	28.0	26.0	13.0	8.1	4.5	3.3	2.5
New Hampshire	0.8	2.7	2.9	1.6	1.5	1.1	1.9	3.0	1.6	1.5	1.5	1.4	0.9
New Jersey	5.6	4.2	4.0	3.7	3.9	3.9	4.9	3.9	4.2	1.9	3.4	3.3	2.2
New Mexico	71.1	44.7	21.7	24.8	66.5	48.0	20.8	20.4	8.9	3.2	3.8	2.2	1.7
New York	11.9	8.4	3.3	4.3	5.0	4.8	4.1	3.7	3.5	2.7	2.4	3.0	1.7
New York City	10.8	13.9	12.1	9.9	12.8	13.7	8.3	12.3	8.0	5.4	6.6	5.5	5.5
North Carolina	9.7	2.4	1.6	1.4	2.1	1.5	2.8	2.8	1.7	2.2	1.9	2.9	2.5
North Dakota	5.2	10.4	22.5	12.6	0.9	3.6	21.8	2.2	0.6	0.5	0.6	0.5	0.6
Ohio	2.7	3.3	4.1	3.1	10.8	15.8	7.0	3.0	3.6	5.8	2.3	2.3	2.6
Oklahoma	19.3	9.0	6.8	6.6	12.9	43.6	78.5	43.5	19.9	15.9	7.9	3.3	1.5
Oregon	29.0	15.3	18.5	17.5	40.2	86.7	27.4	11.6	13.3	7.6	5.0	3.0	1.8
Pennsylvania	15.0	3.6	2.1	1.5	1.8	2.1	4.5	4.2	3.5	3.0	3.6	2.5	2.4
Rhode Island	5.2	11.4	17.0	7.7	3.0	3.5	2.6	13.3	1.8	3.5	3.0	7.1	3.2
South Carolina	1.3	1.2	0.6	0.5	1.1	1.2	1.5	2.9	1.4	1.2	2.4	2.1	1.6
South Dakota	70.8	118.3	30.1	2.5	5.3	13.5	5.8	3.7	5.4	1.4	0.4	0.4	0.4
Tennessee	4.4	3.2	2.3	2.0	6.7	37.3	14.7	7.8	4.3	2.7	2.7	3.3	2.1
Texas	16.0	15.4	10.3	15.5	15.7	16.1	18.2	23.3	17.9	12.6	9.2	2.6	3.9
Utah	35.3	16.2	38.2	44.2	38.8	34.9	53.1	26.6	9.3	3.0	3.2	2.9	2.4
Vermont	1.1	4.2	2.5	1.6	2.4	1.4	2.0	2.5	2.9	4.0	1.6	2.6	0.6
Virginia	4.9	3.0	2.6	2.4	3.0	3.6	3.3	3.7	3.3	2.7	2.3	2.3	2.2
Washington	28.1	12.1	16.8	17.6	21.0	17.2	18.1	18.1	18.2	8.8	5.0	3.1	2.7
West Virginia	1.3	1.2	0.6	1.6	1.3	1.3	1.0	0.7	0.5	2.6	3.1	1.6	1.3
Wisconsin	9.8	15.8	18.7	10.0	4.8	3.6	3.8	3.6	3.6	1.5	2.0	1.6	3.6
Wyoming	16.1	29.5	3.0	3.6	8.6	23.0	8.5	7.3	7.7	1.9	0.8	1.4	0.6

Hepatitis B (cases per 100,000 persons)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Alabama	4.1	4.2	3.3	2.6	2.1	2.7	1.8	1.9	1.7	2.0	1.6	2.0	2.3
Alaska	10.5	7.2	3.6	2.5	2.2	2.2	2.6	2.5	2.1	2.9	2.1	1.6	1.9
Arizona	13.2	4.7	5.1	2.4	2.5	2.8	5.3	4.4	4.0	2.9	4.2	3.1	4.6
Arkansas	5.2	6.5	4.5	3.7	2.4	3.3	3.7	4.2	4.5	3.8	4.1	4.0	4.4
California	9.8	8.6	9.2	6.0	6.5	5.5	5.4	5.1	4.4	3.7	3.2	2.5	1.7
Colorado	5.9	4.2	3.5	2.3	2.7	3.7	3.5	3.8	2.6	2.4	2.5	2.3	1.8
Connecticut	7.8	5.9	4.9	2.3	2.9	2.6	2.5	1.7	1.2	1.2	1.4	1.4	2.0
Delaware	14.6	7.9	30.3	2.6	2.0	1.3	1.2	1.0	0.5	0.1	1.9	3.6	1.7
District of Columbia	21.4	26.4	14.5	7.5	9.4	3.8	5.9	5.7	3.6	4.8	6.1	2.3	3.9
Florida	7.4	7.2	6.9	6.2	5.4	4.7	4.6	4.4	3.5	3.9	3.8	3.1	3.2
Georgia	8.3	8.9	4.7	9.7	7.9	1.4	0.8	3.0	2.7	3.0	4.3	5.2	5.7
Hawaii	9.5	4.4	1.6	1.9	2.4	2.7	1.2	0.9	1.5	1.3	1.0	1.8	1.0
Idaho	9.1	7.0	7.9	8.1	6.8	8.8	7.4	4.5	4.0	2.3	0.8	0.8	0.5
Illinois	5.2	3.6	3.4	2.9	2.7	2.5	2.8	2.4	1.9	1.7	1.4	1.7	1.5
Indiana	6.6	4.2	4.0	4.4	3.7	4.2	2.5	1.7	2.0	1.3	1.4	1.2	1.4
Iowa	1.9	1.5	1.2	1.3	1.0	1.6	2.6	1.5	1.9	1.5	1.3	0.8	0.7
Kansas	5.6	2.4	2.6	2.6	1.2	2.1	1.2	1.2	1.1	0.6	1.0	0.5	0.9
Kentucky	12.6	5.2	2.9	2.6	2.0	1.8	2.0	1.1	1.2	1.3	2.0	1.6	1.6
Louisiana	8.9	9.1	6.1	6.3	4.7	5.6	4.8	4.8	5.0	3.9	3.5	2.8	3.0
Maine	2.4	2.6	2.2	0.9	0.9	1.0	0.6	0.5	0.4	0.2	0.4	0.5	1.1
Maryland	11.8	8.0	8.2	5.4	7.1	5.2	3.3	3.4	2.8	2.9	2.5	2.6	2.4
Massachusetts	10.7	9.1	6.4	3.6	3.3	1.9	1.8	1.3	1.3	0.7	0.2	0.6	2.6
Michigan	6.9	6.5	6.2	4.1	4.5	4.1	4.3	4.7	4.8	5.2	4.3	6.2	3.3
Minnesota	2.8	2.3	2.1	2.1	1.8	2.0	2.0	1.3	1.5	1.7	1.2	0.9	1.0
Mississippi	4.8	2.9	13.1	14.8	.	.	9.0	6.6	3.4	4.7	3.9	3.3	3.2
Missouri	12.3	10.6	10.3	11.2	10.2	8.2	6.1	6.7	4.6	4.2	2.7	2.3	2.1
Montana	9.4	8.7	4.9	3.3	2.5	2.8	2.4	1.4	0.9	2.4	0.9	0.3	1.1
Nebraska	2.1	2.5	2.8	1.2	1.9	2.4	2.4	1.6	1.4	1.3	2.6	2.0	1.8
Nevada	24.3	15.0	8.0	5.4	4.0	4.3	5.9	4.8	4.6	3.3	2.7	2.5	3.3
New Hampshire	3.7	3.0	4.5	2.4	2.5	2.0	1.8	1.5	1.8	1.4	1.5	1.3	2.0
New Jersey	7.0	6.3	6.5	5.2	5.2	4.6	3.5	3.1	2.5	1.7	2.1	3.4	4.0
New Mexico	15.5	13.3	13.2	13.3	13.2	19.1	24.4	14.9	17.9	12.4	7.9	7.4	7.9
New York	6.5	5.5	4.8	4.2	3.7	3.8	3.3	3.4	2.4	1.9	1.4	1.4	1.3
New York City	9.2	5.0	6.0	4.8	7.4	7.1	6.7	6.2	5.7	3.9	6.9	8.2	9.1
North Carolina	16.4	8.3	6.3	4.5	4.1	4.3	4.6	3.6	3.2	2.9	3.2	2.7	2.8
North Dakota	1.3	0.3	0.6	0.2	0.2	0.8	0.3	1.1	0.6	0.3	0.5	0.3	1.3
Ohio	3.6	3.7	2.1	1.7	1.5	1.0	1.1	0.8	0.7	0.8	0.9	0.8	1.0
Oklahoma	5.8	6.5	5.9	6.0	4.3	5.3	1.7	2.0	5.1	5.5	5.2	3.3	3.1
Oregon	14.7	10.6	10.3	7.3	5.1	4.1	4.0	3.7	6.1	3.5	3.6	4.8	3.6
Pennsylvania	6.2	4.2	4.1	3.0	3.4	2.4	2.4	2.9	3.0	2.4	2.2	2.7	2.8
Rhode Island	5.3	2.8	2.0	1.9	0.8	1.0	1.9	2.2	7.6	4.3	4.4	3.1	3.4
South Carolina	17.8	18.7	1.5	1.4	0.9	1.5	2.7	2.6	1.7	1.6	0.6	1.8	3.3
South Dakota	1.1	1.3	0.7	.	0.5	0.3	0.7	0.1	0.5	0.1	0.3	0.1	0.4
Tennessee	17.7	19.1	21.0	22.7	20.2	12.4	9.7	8.5	5.4	3.8	4.2	4.8	2.5
Texas	10.5	11.3	8.7	7.5	7.8	6.5	6.6	6.4	9.9	4.3	5.1	3.3	5.1
Utah	6.4	2.5	1.6	3.7	4.9	3.8	6.4	4.5	3.1	1.8	1.6	1.1	2.3
Vermont	9.0	3.4	3.0	1.7	2.1	1.2	2.4	1.9	1.7	0.8	1.0	0.8	1.1
Virginia	4.5	3.5	3.0	2.4	2.2	1.8	2.4	2.0	1.6	1.5	2.4	3.0	3.1
Washington	12.6	9.4	7.7	4.7	4.8	4.2	2.9	2.0	2.4	1.9	2.2	2.9	1.4
West Virginia	4.9	3.6	3.0	2.4	2.6	2.9	2.0	0.9	0.8	1.6	1.7	1.9	1.4
Wisconsin	9.1	9.7	9.6	6.3	1.9	1.6	1.7	10.9	9.8	0.6	0.8	0.9	0.9
Wyoming	5.1	7.2	4.7	7.2	5.1	6.9	9.4	5.2	2.3	2.9	0.6	0.6	3.4

Hepatitis C/NANB (cases per 100,000 persons)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Alabama	0.6	0.6	0.4	0.1	0.5	0.1	0.2	0.3	0.1	0.0	0.2	0.1	0.2
Alaska	1.6	2.3	1.2	2.0	.	0.5	0.5	.	.	.	.	.	.
Arizona	2.0	0.5	0.9	0.3	0.7	1.4	1.7	0.6	0.4	1.0	0.4	0.2	0.1
Arkansas	0.8	0.2	0.2	0.2	0.3	0.3	0.3	0.6	1.2	1.2	0.4	0.6	0.4
California	2.1	1.3	3.4	1.8	1.8	1.6	1.5	2.7	2.6	0.6	0.3	0.3	0.2
Colorado	1.6	2.7	2.9	1.7	2.2	1.8	1.7	1.0	0.8	0.9	0.4	0.2	0.1
Connecticut	0.3	0.1	.	.	.	.	.	.	.	.	.	.	.
Delaware	1.3	0.7	29.6	0.1	0.3	.	0.1	.	.	.	0.3	1.4	.
District of Columbia	1.3	40.8	47.5	0.5	0.4	.	.	.	.	0.2	0.5	.	.
Florida	0.6	0.7	1.4	0.3	0.7	0.9	0.9	1.0	0.7	0.5	0.3	0.4	0.5
Georgia	0.2	1.5	2.0	6.5	3.1	0.4	.	.	0.1	0.1	0.0	.	0.7
Hawaii	1.7	1.6	14.8	0.3	0.4	10.5	18.3	15.3	4.5	.	0.2	.	0.1
Idaho	0.8	0.6	.	.	6.3	5.0	8.3	7.1	7.1	0.6	0.2	0.2	0.1
Illinois	0.7	0.9	1.0	0.9	0.7	0.7	0.8	0.7	0.3	0.4	0.2	0.1	0.2
Indiana	0.6	5.7	0.5	0.3	0.2	0.2	0.1	0.2	0.1	0.1	.	0.0	0.0
Iowa	0.5	0.4	0.2	0.3	0.5	0.5	1.9	1.0	0.3	.	0.1	.	0.0
Kansas	1.6	0.8	0.6	0.7	0.7	0.7	0.6	0.5	0.2	.	0.3	0.3	.
Kentucky	1.1	0.2	0.2	0.4	0.8	0.9	0.7	0.4	0.6	0.7	1.0	0.3	0.1
Louisiana	0.1	2.4	3.0	4.2	5.0	5.1	6.7	6.3	3.1	6.9	10.2	3.4	2.2
Maine	0.4	0.4	0.5	0.2	.	.	.	.	.	0.2	0.2	0.1	.
Maryland	0.9	1.0	0.7	0.8	0.4	0.1	0.1	0.2	0.4	0.4	0.3	0.2	0.3
Massachusetts	0.4	0.5	0.9	1.3	2.0	1.7	1.2	0.8	0.8	0.1	0.3	0.4	0.1
Michigan	0.5	1.5	5.1	4.2	2.1	2.5	3.6	4.0	4.8	8.3	2.0	1.4	0.9
Minnesota	0.8	0.4	0.6	0.3	0.4	0.1	0.2	0.1	0.4	0.5	0.3	0.7	0.3
Mississippi	0.6	0.4	0.0	0.4	.	.	5.6	4.1	3.0	7.1	10.7	3.8	3.2
Missouri	0.8	0.7	0.5	0.5	0.6	0.4	0.4	0.2	0.3	5.8	10.8	19.8	10.8
Montana	0.9	4.1	3.4	0.4	1.5	2.1	2.3	2.7	0.9	0.6	0.6	0.1	0.1
Nebraska	0.3	0.1	5.6	0.7	0.9	1.4	0.5	0.2	0.3	0.2	0.3	0.6	0.9
Nevada	2.6	2.4	1.1	1.4	1.4	1.7	1.3	1.1	1.1	0.6	0.9	0.6	1.4
New Hampshire	0.8	0.8	2.2	0.7	1.0	1.2	0.6	.	.	.	.	.	.
New Jersey	0.6	1.4	1.2	1.2	2.7	2.4	.	.	.	.	6.7	14.3	0.1
New Mexico	1.8	1.6	3.4	6.6	2.7	3.1	4.5	3.5	5.6	2.0	0.9	0.7	0.2
New York	0.9	2.2	1.8	2.4	2.1	3.2	2.5	2.6	1.2	0.6	0.4	0.3	0.5
New York City	0.4	0.1	0.1	0.0	0.1	0.0	0.0	.	.	.	.	.	.
North Carolina	2.2	1.7	1.3	1.2	0.8	0.9	0.6	0.7	0.3	0.4	0.2	0.3	0.3
North Dakota	0.3	0.8	0.6	0.5	0.2	1.1	.	0.6	.	0.2	0.2	.	.
Ohio	0.9	1.5	0.9	0.3	0.2	0.1	0.3	0.2	0.1	0.0	0.1	0.1	0.0
Oklahoma	0.9	1.5	1.5	1.5	1.9	1.7	0.2	0.3	0.7	0.5	0.5	0.2	0.6
Oregon	2.1	4.5	2.9	1.8	1.5	1.2	0.3	0.1	0.6	0.7	0.8	0.4	0.4
Pennsylvania	0.7	0.4	0.3	0.3	0.4	0.5	0.5	0.7	1.0	0.6	0.4	1.2	0.5
Rhode Island	.	1.2	0.7	1.3	2.0	0.8	0.6	0.8	0.4	0.3	0.7	.	0.1
South Carolina	0.4	1.1	0.0	0.1	0.3	0.6	0.9	1.1	0.5	0.6	0.1	0.3	0.1
South Dakota	0.6	0.1	.	.	.	0.1	.	.	.	.	.	.	0.1
Tennessee	3.1	9.7	25.2	19.6	17.3	18.8	7.5	4.5	3.2	2.2	2.0	1.2	0.5
Texas	0.9	0.8	1.6	2.3	1.7	1.9	1.1	2.0	2.3	1.8	1.3	2.3	1.3
Utah	1.6	1.4	2.0	2.2	0.9	0.7	0.9	0.2	1.0	0.3	0.6	0.1	0.2
Vermont	1.4	1.2	3.0	1.0	2.8	2.4	4.4	0.7	1.0	1.2	0.8	1.1	2.4
Virginia	0.7	0.6	0.8	0.8	0.4	0.3	0.3	0.4	0.2	0.2	0.0	0.0	0.2
Washington	2.9	3.3	3.6	4.2	5.5	4.3	1.2	0.7	0.5	0.4	0.7	0.5	0.4
West Virginia	0.2	0.2	0.4	2.4	2.6	2.4	0.5	1.0	0.5	1.2	1.3	1.4	0.2
Wisconsin	0.3	2.0	2.0	0.8	.	.	.	0.5	2.8	0.3	.	.	0.1
Wyoming	1.1	1.7	14.2	25.4	37.3	46.6	37.3	17.3	21.2	18.3	0.4	1.6	1.0

Acute Hepatitis A, 2002

Summary

With an average of 28,000 cases per year (range: 23,112-35,821) during 1987-1997, hepatitis A has historically been one of the most frequently reported notifiable diseases in the United States. However, effective vaccines to prevent hepatitis A virus (HAV) infection have been available in the U.S. since 1995 for use in individuals at least two years of age. These vaccines have provided the opportunity to substantially reduce disease incidence and potentially eliminate transmission.

Since 1996, hepatitis A vaccine has been recommended for individuals at increased risk of hepatitis A including international travelers, men who have sex with men, and injecting and non-injecting drug users [1]. In 1999, routine vaccination was also recommended for children living in 11 states, ten of which are in the western region, with average hepatitis A rates during 1987-1997 that were at least 20/100,000 and was suggested for children in an additional six states where rates were less than 20/100,000 but above 10/100,000 which was approximately the national average for the time period [2].

Hepatitis A rates have declined steadily since the issuance of these recommendations, with the most dramatic decreases occurring in the age groups and regions for which routine childhood vaccination is recommended, suggesting that this strategy is reducing the transmission of HAV in the United States. The overall rate in 2002 is the lowest yet recorded. The declines in rates that have been observed in recent years have also been accompanied by substantial shifts in the epidemiologic profile of this disease in the United States with an increasing proportion of cases occurring among adults, particularly those in high risk groups such as international travelers and men who have sex with men. Further monitoring of disease rates is needed to determine if the current low rates are sustained and attributable to vaccination and to identify groups and areas where additional vaccination efforts are needed.

- Historically, hepatitis A rates have varied cyclically with periodic nationwide increases. The national rate of hepatitis A has declined steadily since the last peak that occurred in 1995. With 8,795 cases reported for the year 2002, the national incidence of hepatitis A is now the lowest yet recorded (3.1/100,000). Figure 3

- In addition to temporal variation, hepatitis A rates have consistently varied geographically with higher rates in the West than elsewhere in the country. Following the 1999 issuance of recommendations for routine childhood vaccination that focused on states with consistently elevated rates of hepatitis A, incidence rates in the West have declined steadily and for the first time are approximately equal to those in other regions of the U.S. Figure 4, Figure 5

- Incidence of hepatitis A varies by age. Since the last nationwide increase, rates have declined among all age groups but the greatest decreases have been among children. Historically, the highest rates have been among children and young adults with the lowest rates observed among persons greater than 40 years of age. However, since 1997, rates among children have declined more rapidly than among adults and in 2002, the highest rates were in persons 25-39 years of age. Although the decline in rates was greatest in children 5-14 years, the lowest rates in 2002 continue to be among persons <5 years of age and among persons 40+ years. However, asymptomatic infection is common among very young children and reported cases in children <5 represent only a small proportion of infections occurring in this age group. The low and relatively stable rates among persons 40+ years of age reflect the higher proportion of persons in this age group with immunity due to a previous infection; data from the Third National Health and Nutrition Examination Survey (NHANES IIII) conducted during 1988-1994 (CDC, unpublished data) indicated that approximately one third of the U.S. population have serologic evidence of immunity to HAV. Figure 6

- Rates of hepatitis A have historically been higher among males than females and the difference between them has increased over the decade. Although the ratio of male to female cases declined in 2002 relative to 2001, the 2002 rate among males (3.8/100,000) was 1.7 times higher than that among females (2.3/100,000) Figure 7 The rate of hepatitis A is similar in males and females in age groups less than 19 years and in persons greater than 60 but between ages 20-60, males had rates that were 1.6-3.1 times higher than among females with the greatest difference being observed for adults age 35-39. Figure 8

- Historically, hepatitis A rates have differed by race with the highest rates among American Indian/Alaska Natives and the lowest rates among Asians and by ethnicity with higher rates among Hispanics than non-Hispanics. However, rates among American Indians which were greater than 60/100,000 prior to 1995 have decreased dramatically following widespread vaccination in this group and in 2002, are approximately the same or lower than those in other races. Rates among Hispanics have also decreased since 1997 but remain higher than those for Non-Hispanics. Figure 9

- Among cases where information about exposures during the incubation period was determined, the most common risk factor for hepatitis A in 2002 continues to be sexual or household contact with another person with hepatitis A with 11.6% of cases attributed to this exposure. Over the decade, the proportion of cases attributed to male homosexual activity has increased from 1.5% starting in 1992 to 2.3% (1995) to 7.2% (1998) to 8.4% in 2002. Similarly, the proportion attributed to travel has increased from 1.3% (1992) to 2.8% (1995) to 5.6%(1998) to 9.4%(2002). The proportion of cases attributed to illegal drug use which had been declining steadily since 1996 when almost 10% of cases were associated with this risk factor increased from 3.6% in 2001 to 5.9% in 2002. In comparison, the proportion of cases attributed to either food- or water-borne outbreaks, or to being a child or employee in daycare declined from approximately 15% of cases in the years 1992-1995 to 5% of cases in 2002. No risk factor was identified for approximately 50% of cases interviewed. Table 4, Table 5, Figure 10

- The clinical characteristics of hepatitis A cases reported in 2002 are similar to previous years with 72% of cases having jaundice, 25% requiring hospitalization for their illness and 0.5% resulting in death. The proportion of cases that were jaundiced was highest in persons 15-39 years of age (80%) and lowest among persons older than 60 years (42%). The proportion of cases hospitalized increased with age from 5% among children <5 years of age to 34% among persons 60 years of age or older. Table 6

Figure 3: Incidence of Reported Hepatitis A, United States, 1966-2002

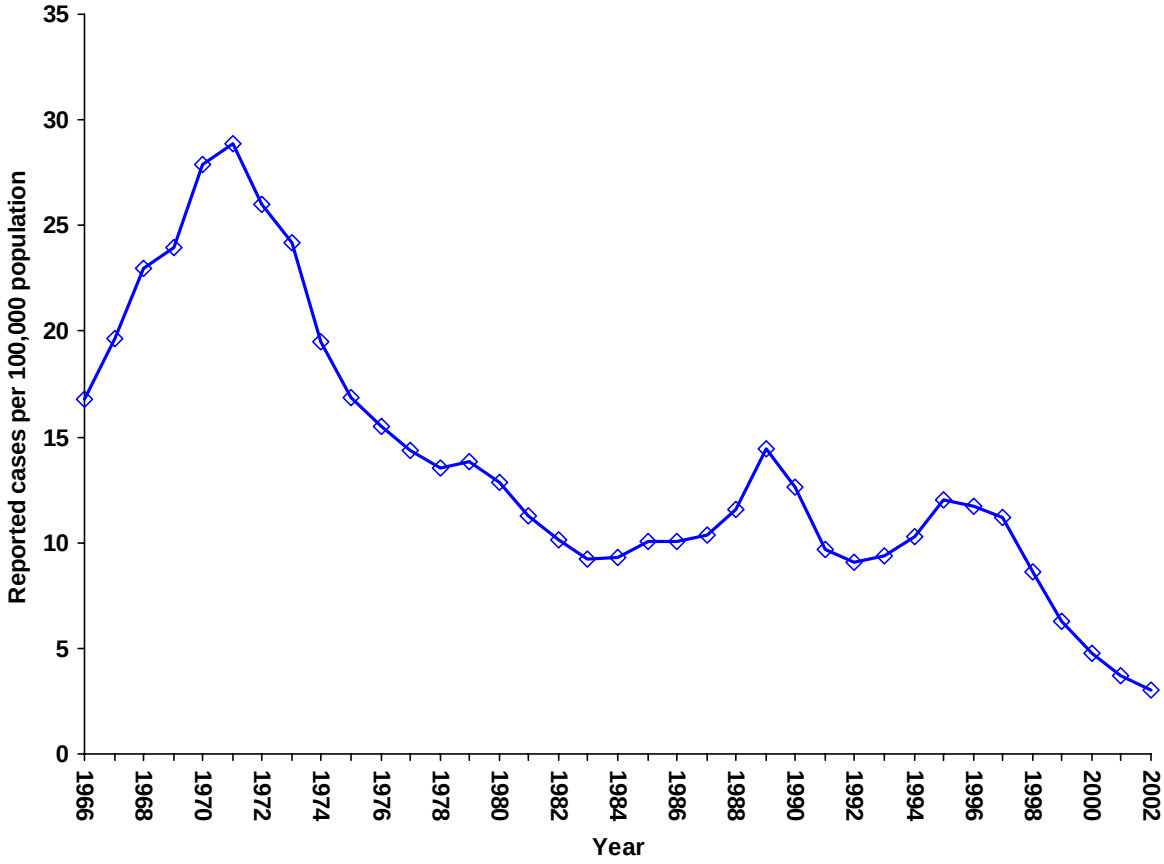
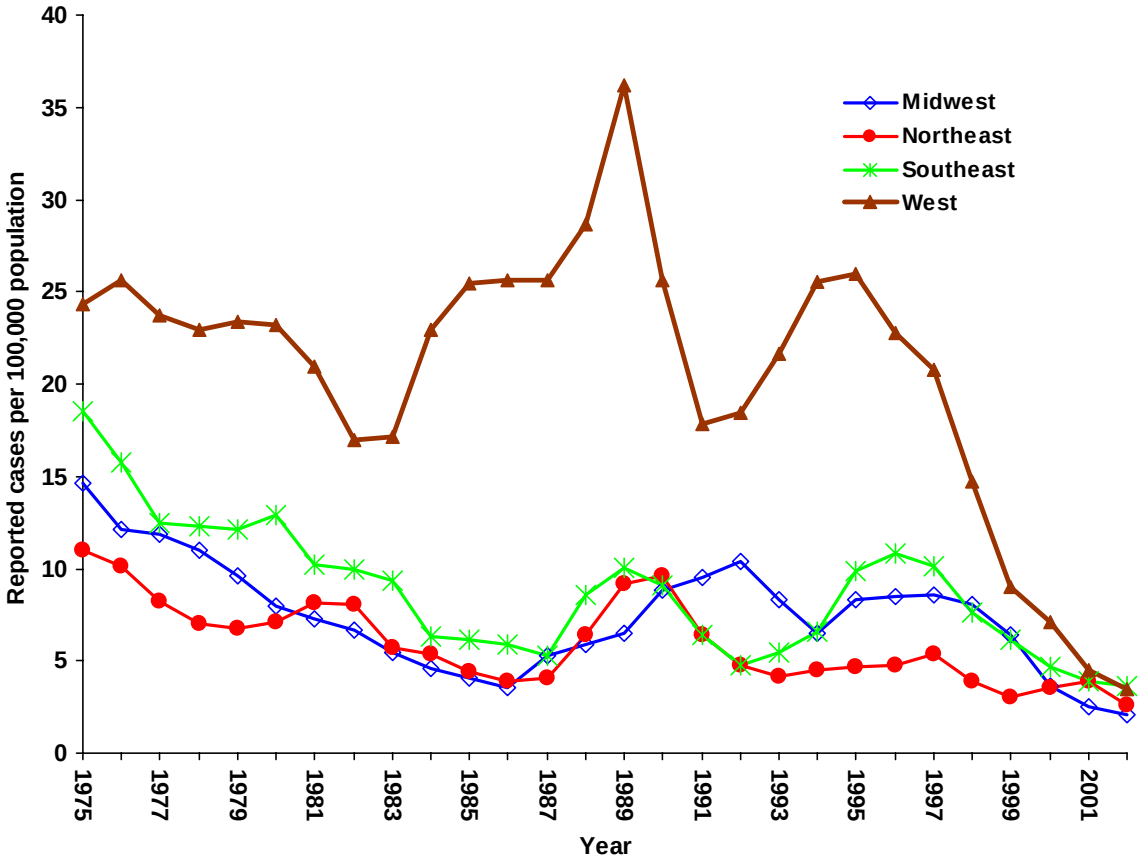


Figure 4: Incidence of Reported Hepatitis A, by Region, United States, 1975-2002



See page 5 for regional categories

Figure 5: Incidence of Reported Hepatitis A, by County, United States, 2002

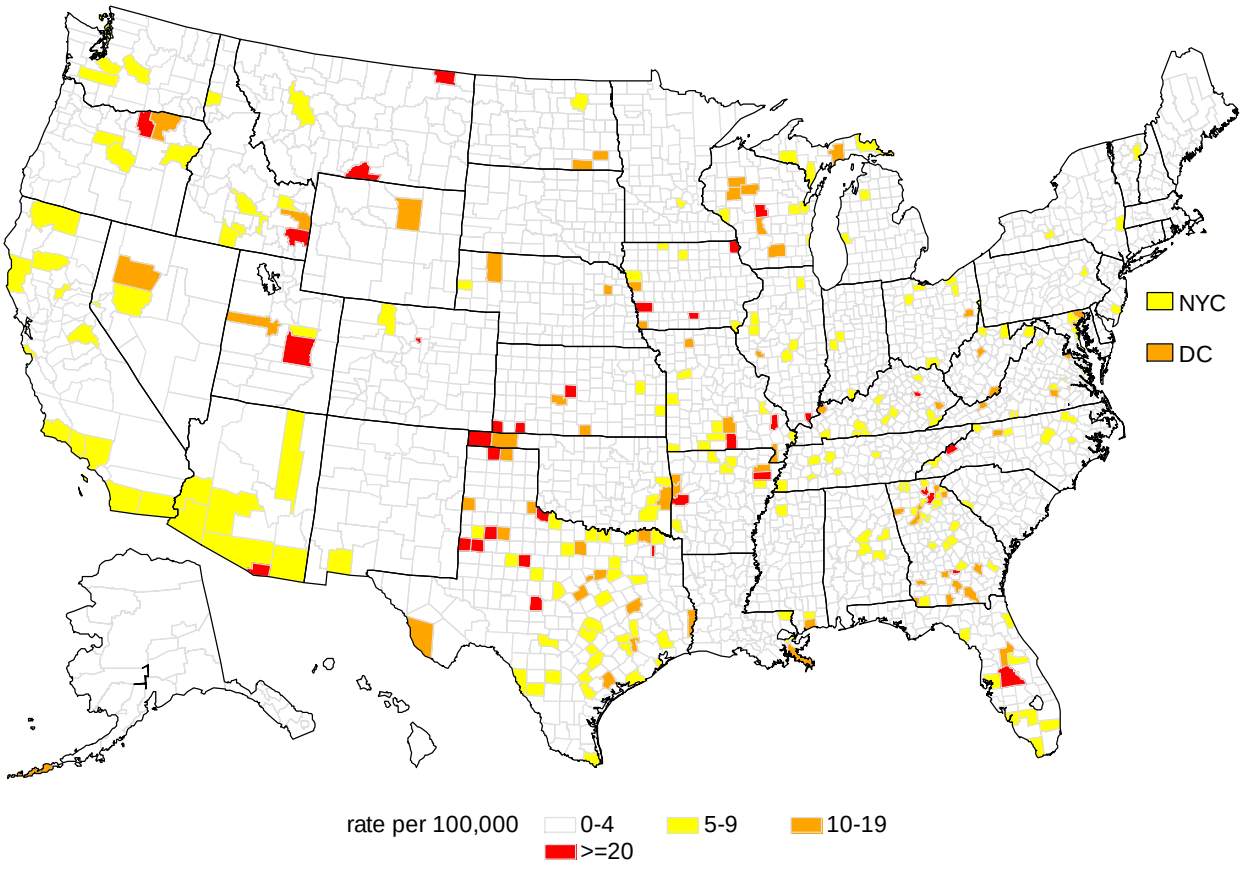


Figure 6: Incidence of Reported Hepatitis A, by Age, United States, 1990-2002

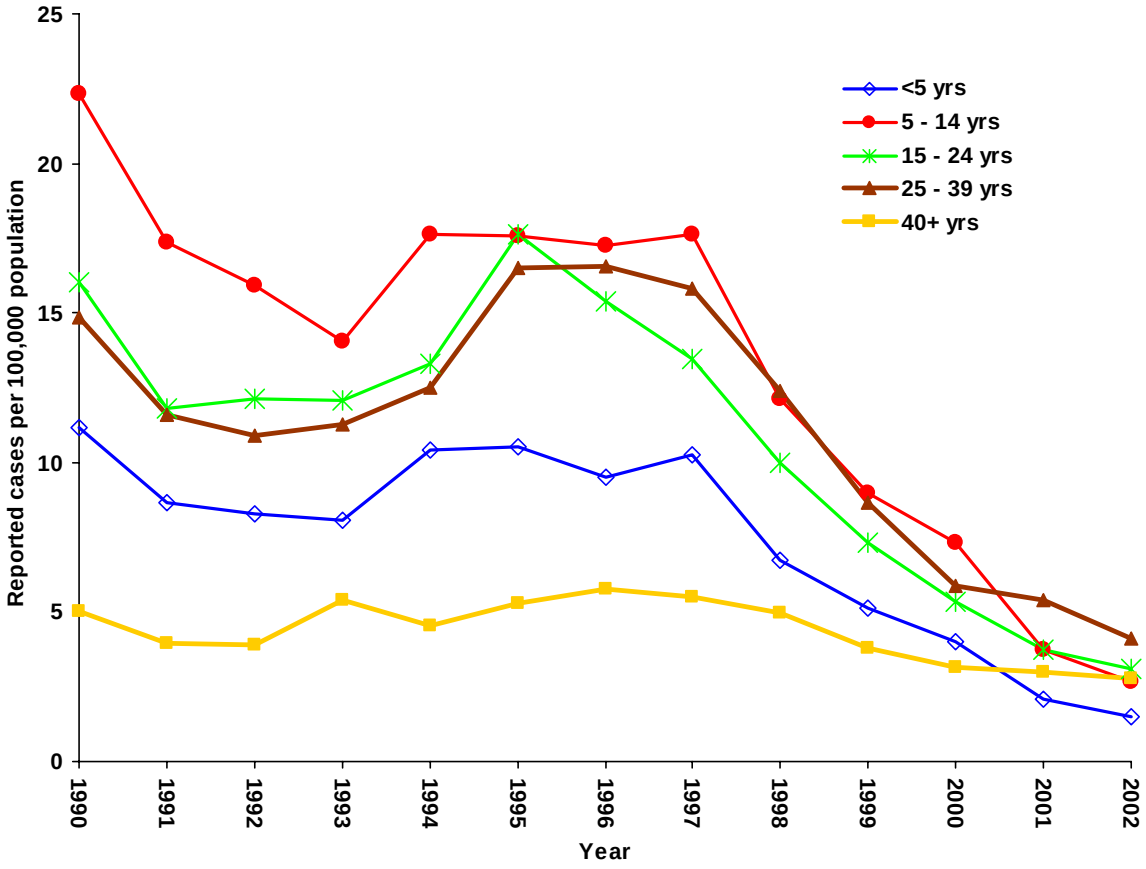
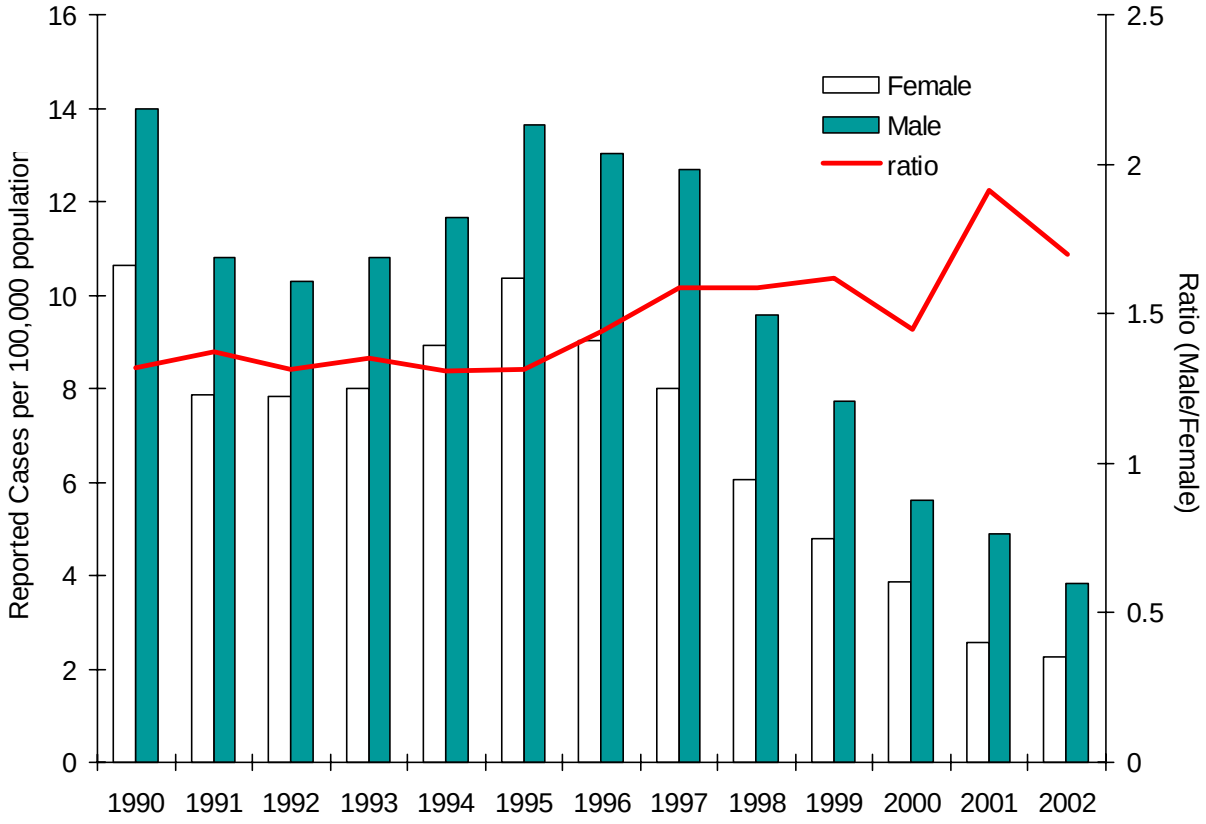
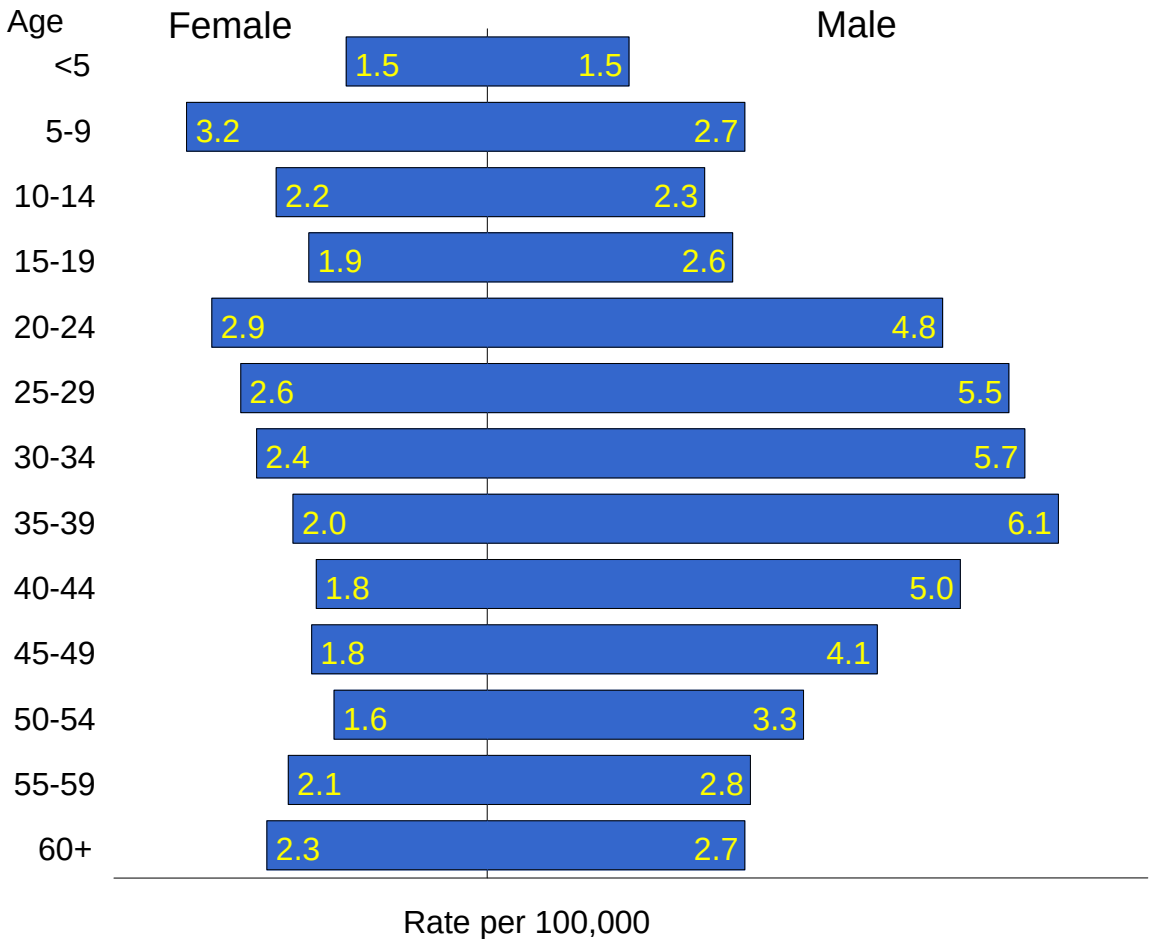


Figure 7: Incidence of Reported Hepatitis A, by Sex, United States, 1990-2002



Note: The bars indicate the rate per 100,000 (the left y-axis) by gender; the line is the ratio (right y-axis) of the incidence rate among males to that among females.

Figure 8: Incidence of Reported Hepatitis A, by Age and Sex, United States, 2002



* A total of 8795 cases of Hepatitis A were reported. However, rates exclude patients with missing data for age and sex.

Figure 9: Incidence of Reported Hepatitis A, by Race and Ethnicity, United States, 1990-2002

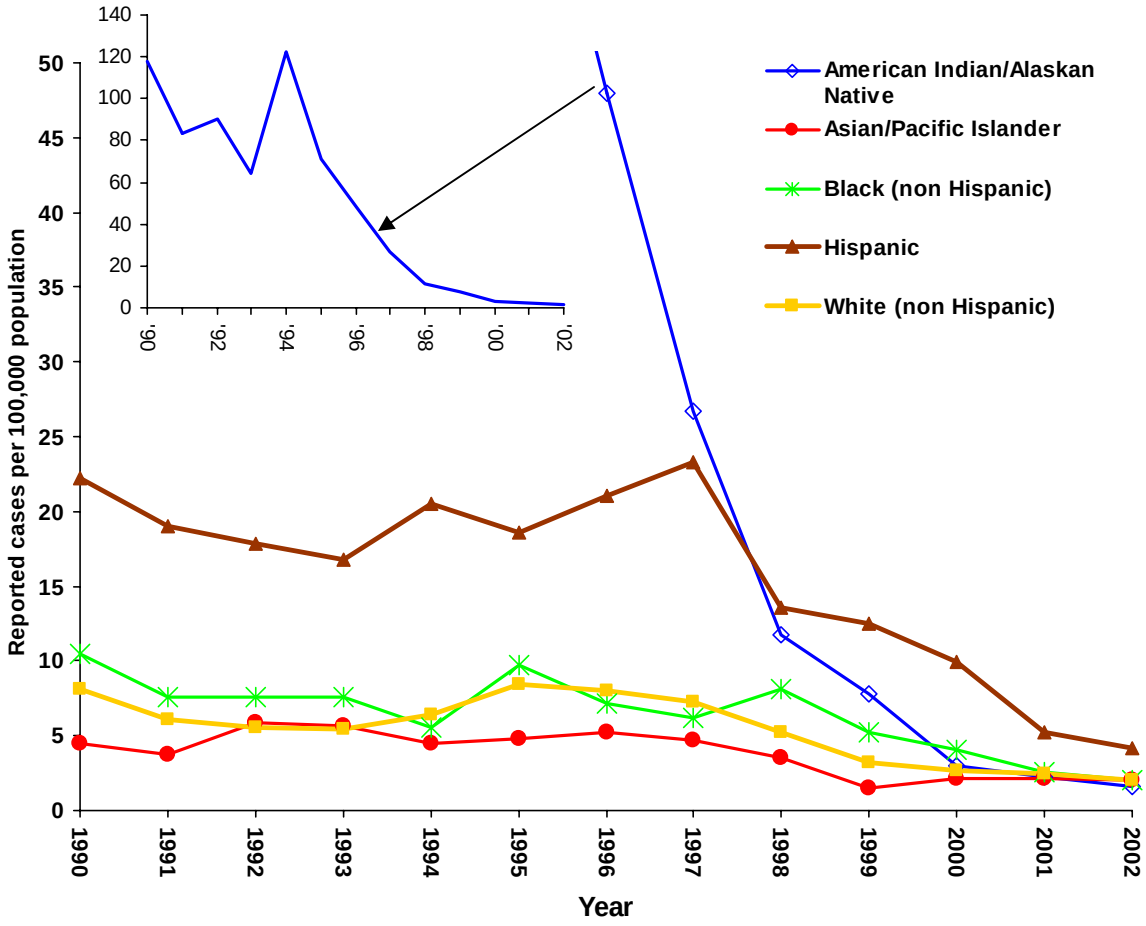


Table 4: Epidemiologic Characteristics* of Patients Reported with Hepatitis A, by Age, United States, 2002 (Crude frequency)

	Age Groups							
	<15 (n=341)		15-39 (n=1437)		40+ (n=1259)		Total (n=3037)	
	N	%	N	%	N	%	N	%
Sexual or Household Contact with hepatitis A patient	67	19.6	179	12.5	106	8.4	352	11.6
International travel†	110	32.3	122	8.5	84	6.7	316	10.4
Homosexual activity (Male)	.	.	198	13.8	104	8.3	302	9.9
Injection drug use	1	0.3	141	9.8	43	3.4	185	6.1
Child/employee in day-care center	29	8.5	15	1.0	16	1.3	60	2.0
Suspected food- or waterborne outbreak	10	2.9	27	1.9	29	2.3	66	2.2
Contact of day-care child/employee	31	9.1	83	5.8	42	3.3	156	5.1
Other Contact with hepatitis A patient¥	99	29.0	274	19.1	170	13.5	543	17.9
Unknown	130	38.1	735	51.1	855	67.9	1,720	56.6

*During the 2 to 6 weeks prior to illness

† Of cases that reported travel to a region endemic for hepatitis A, 75% traveled to South/Central America, 15% to Asia/South Pacific, 4% to Africa and 6% to the Middle East.

¥ Examples of other contact include playmate, drug sharing contact, or careprovider.

Note 1: A total of 8,795 cases of hepatitis A were reported. This table includes case reports that contained sufficient information to verify the case definition (i.e. laboratory test results, clinical characteristics).

Table 5: Epidemiologic Characteristics* of Patients Reported with Hepatitis A, by Age, United States, 2002(Mutually exclusive risk factor hierarchy)

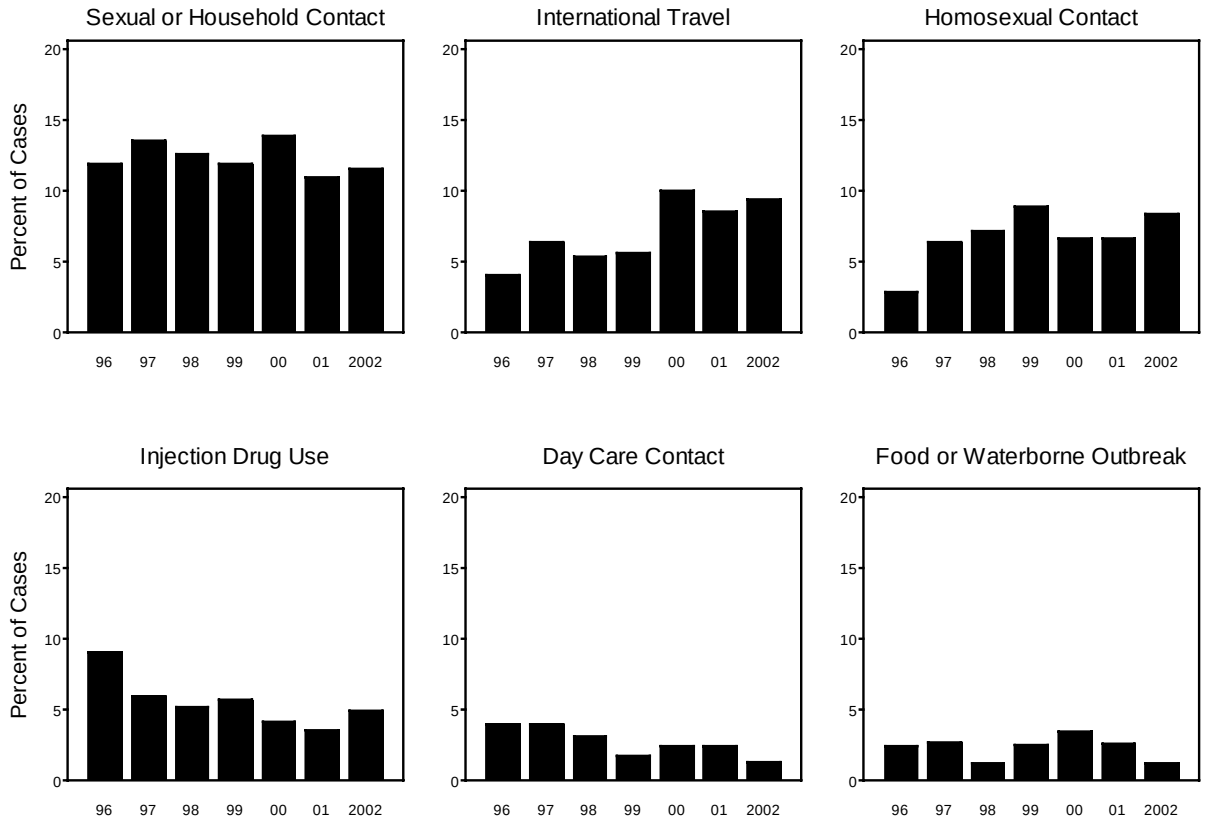
	Age Groups						Total	
	<15		15-39 yrs		40+ yrs			
	N	%	N	%	N	%	N	%
Sexual or Household Contact with hepatitis A patient	67	19.6	179	12.5	106	8.4	**352**	**11.6**
International travel†	94	27.6	113	7.9	79	6.3	**286**	**9.4**
Homosexual activity (Male) ‡	.	.	167	11.6	87	6.9	**254**	**8.4**
Injection drug use	1	0.3	114	7.9	35	2.8	**150**	**4.9**
Child/employee in day-care center	18	5.3	9	0.6	12	1.0	**39**	**1.3**
Suspected food- or waterborne outbreak	5	1.5	12	0.8	20	1.6	**37**	**1.2**
Contact of day-care child/employee	6	1.8	54	3.8	27	2.1	**87**	**2.9**
Other Contact with hepatitis A patient	20	5.9	54	3.8	38	3.0	**112**	**3.7**
Unknown	130	38.1	735	51.1	855	67.9	**1,720**	**56.6**
Total	**341**	**100.0**	**1,437**	**100.0**	**1,259**	**100.0**	**3,037**	**100.0**

*During the 2 to 6 weeks prior to illness
† Of cases attributed to travel to a region endemic for hepatitis A, 74% traveled to South/Central America, 15% to Asia/South Pacific, 4% to Africa and 6% to the Middle East.
‡ Among male cases, 13% were attributed to homosexual behavior and in males 15-39 years of age, 16% of cases were attributed to this risk factor.
¥ Examples of other contact include playmate, drug sharing contact, or careprovider.

Note 1: A total of 8795 cases of hepatitis A were reported. This table includes case reports that contained sufficient information to verify the case definition (i.e. laboratory test results, clinical characteristics).

Note 2: For persons who reported multiple risk factors for hepatitis A, their source of infection is assigned to their reported risk factor that is highest in the order listed in the table above.

Figure 10: Trends in Selected Epidemiologic Characteristics among Patients Reported with Hepatitis A, by Year, United States, 1996-2002



Note: This analysis is based on the assignment of cases to mutually exclusive risk categories with the source of infection for persons reporting more than one risk factor attributed to the reported risk factor that is highest in the table on the previous page.

Table 6 : Clinical Characteristics of Patients Reported with Hepatitis A, By Age, United States, 2002

	<5 (n=122)		5-14 (n=400)		15-39 (n=1,740)		40-59 (n=1,078)		60+ (n=492)		All (n=3832)	
	N	%	N	%	N	%	N	%	N	%	N	%
Died From Hepatitis	0	0.0	2	0.5	5	0.3	5	0.5	6	1.2	18	0.5
Hospitalized for Hepatitis	6	4.9	83	20.8	426	24.5	257	23.8	169	34.3	941	24.6
Jaundice	63	51.6	310	77.5	1,392	80.0	793	73.6	204	41.5	2,762	72.1

* A total of 8,795 cases of hepatitis A including 18 deaths were reported. Calculated percentages include patients with non-missing data for age, and for one or more outcomes of interest (i.e. jaundice, hospitalization or death)

Acute Hepatitis B, 2002

Summary

During the past decade, a comprehensive strategy was developed and implemented for achieving the elimination of HBV transmission in the United States [3]. The primary elements of this strategy are: the screening of all pregnant women for HBV infection with the provision of post-exposure prophylaxis to infants born to infected women; the routine vaccination of all infants and children <19 years; and the targeted vaccination of individuals at increased risk of hepatitis B including health care workers, dialysis patients, household contacts and sex partners of persons with chronic HBV infection, recipients of certain blood products, persons with a recent history of having had multiple sex partners or a STD, men who have sex with men, and injecting drug users.

As highlighted below, the incidence of hepatitis B has declined dramatically since implementation of the strategy, particularly among the younger age groups covered by the recommendation for routine childhood immunization. However, high rates of disease continue among adults, particularly males 25-39 years of age, and the high proportion of cases occurring among persons in identified risk groups (i.e. injection drug users, men who have sex with men and persons with multiple sex partners) indicate a need to strengthen efforts to reach these populations with vaccine.

- With 8,064 cases reported nationwide, the overall incidence rate of reported acute hepatitis B in 2002 was 2.8/100,000. That rate was first achieved in 1999 and represents a decline of more than 70% since 1985 when incidence peaked at 11.5/100,000. However, the rate has remained approximately unchanged since 1999. Figure 11

- For the past decade, hepatitis B rates have been similar for all U.S. regions with rates in the West and Southeast only slightly higher than in the Northeast and Midwest (Figure 12, Figure 13). Rates in the Northeast have been increasing since 1999 while rates in the West have declined during the same period.

- Hepatitis B rates vary by age with the highest rates reported among persons 25-39 years of age (5.4/100,000 persons) and the lowest among persons less than 15 years of age (0.1/100,000). Rates have declined in all age groups with the greatest percent decline since 1990 occurring among children <15 years of age (94%) and young adults 15-24 years of age (80% decline). Although less dramatic than the declines in the younger age groups, most of which are covered by the recommendations for routine hepatitis B vaccination, there have also been substantial decreases in the hepatitis B rates among older persons with a 65% and 42% decrease in rates observed for 25-39 year olds and 40+ year old categories respectively. Figure 14

- As in previous years, the rate of acute hepatitis B in males (3.4/100,000) continues to be higher than in females (2.1/100,000). The ratio of cases occurring among males to those occurring among females increased slightly but steadily from 1990 to 2001 and although it dropped slightly in 2002, the rate in males is still 1.6 times higher than in females. (Figure 15). This difference in hepatitis B rates by sex occurs only in persons more than 19 years of age and is greatest in persons more than 35 years of age where the ratio of male/female cases is approximately 2.0. Figure 15, Figure 16

- Rates of hepatitis B continue to decline among all racial and ethnic groups. Figure 17 However, rates of hepatitis B remain highest among non-Hispanic blacks (3.9/100,000) and lowest (1.4/100,000) among non-Hispanic whites. The downward trend in the rate among Asians/Pacific Islanders continues and in 2002, is approaching the rate among non-Hispanic whites. In contrast, the rate among non-Hispanic blacks has remained unchanged since 1999.

- Among cases for which information about exposures during the incubation period were determined, 25% of cases were attributed to sexual contact (including 5% sexual contact with a known hepatitis B case, 11% multiple sexual partners, and 9% male homosexual activity). Another 12% of cases were attributed to injection drug use. Receiving hemodialysis or a blood transfusion, both of which were previously major sources of infection, now account for <0.5% of cases (0.2% and 0.4% respectively), presumably as a result of the vaccination of dialysis patients, improvements in infection control and the required screening of donated blood for markers of HBV infection. Similarly, the percentage of cases attributable to occupational exposure to blood is approximately 0.5% following widespread hepatitis B vaccination of health care workers. In contrast, the role of male homosexual behavior as a source for infection has increased in recent years from 4.0% of cases in 1992 to 8.9% in 2002. Table 7, Table 8, Figure 18

- Among cases of hepatitis B cases reported in 2002, 67% had jaundice, 31% were hospitalized because of their illness and 1.0% resulted in death. The proportion of cases that were jaundiced was approximately 62% in persons 5 years of age or older ranging from 57% among persons 60+ years to 71% among persons 15-39 years of age; less than half of cases occurring in children less than 5 years of age presented with jaundice (warning: number of cases in this age group extremely small). The proportion of cases hospitalized increased with age from 17% among children <5 years of age to 40% among persons 60 years of age or older. Table 9

Figure 11: Incidence of Reported Acute Hepatitis B, United States, 1966-2002

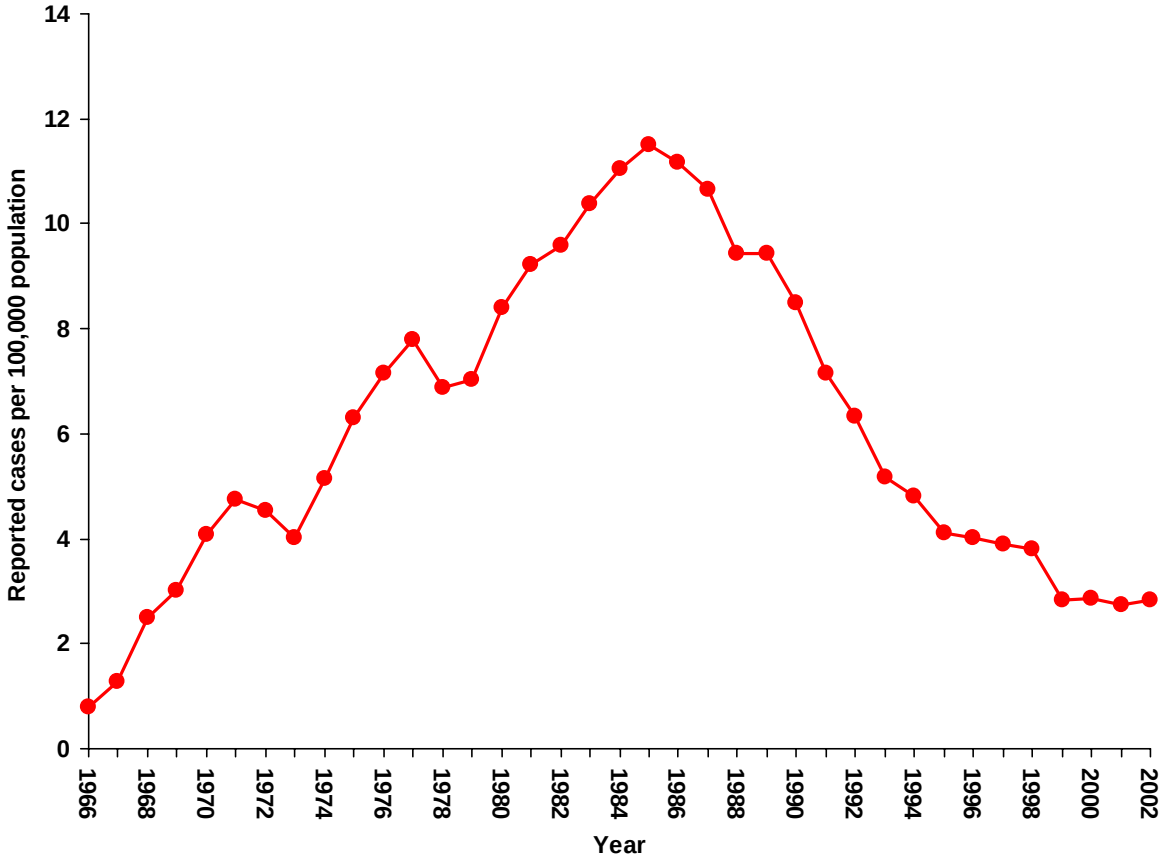
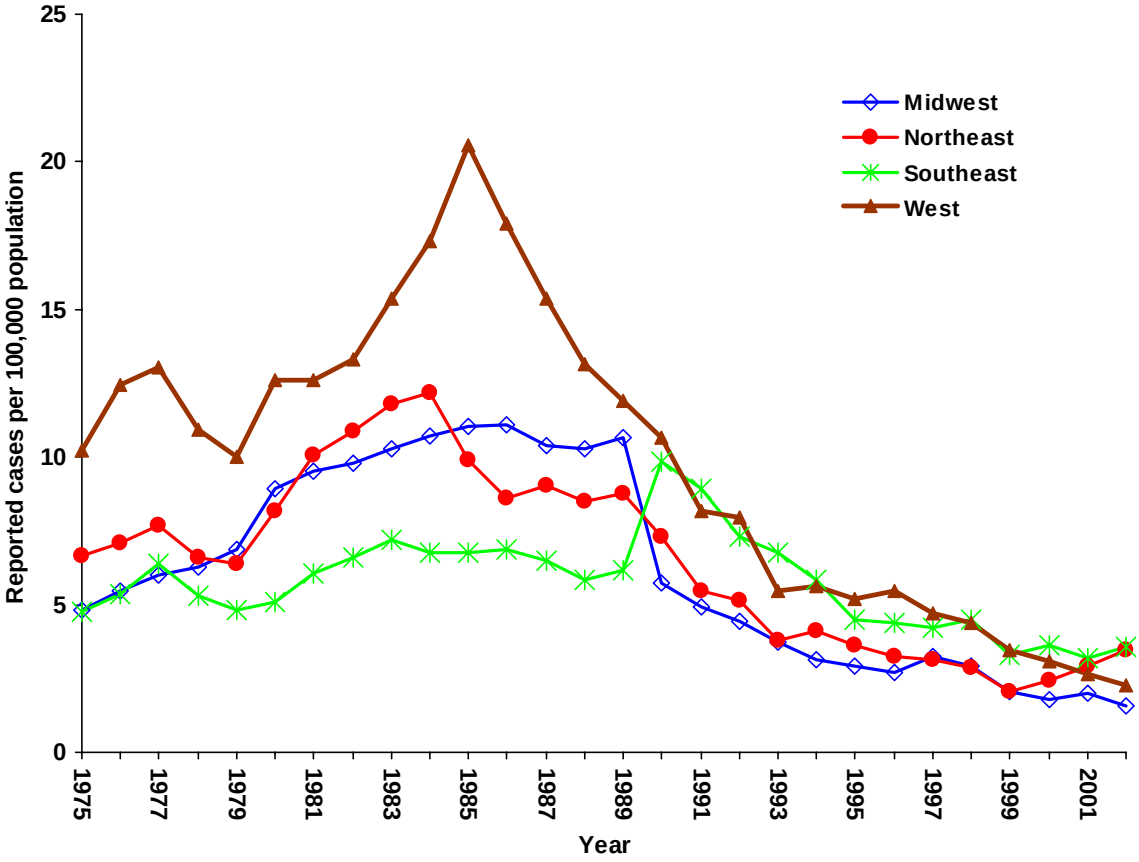
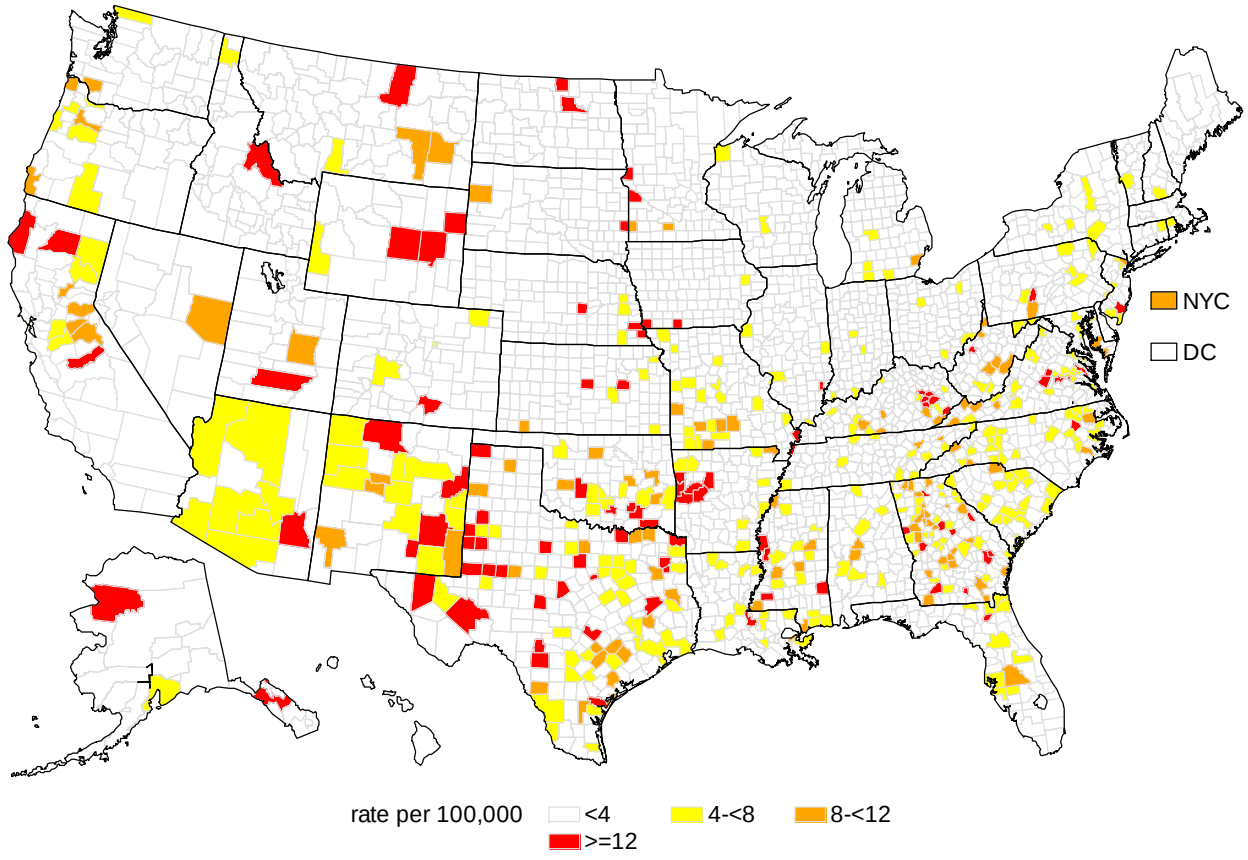


Figure 12: Incidence of Reported Acute Hepatitis B, by Region, United States, 1975-2002



See page 5 for regional categories

Figure 13: Incidence of Reported Acute Hepatitis B, by County, United States, 2002



Source: NNDSS

Figure 14: Incidence of Reported Acute Hepatitis B, by Age, United States, 1990-2002

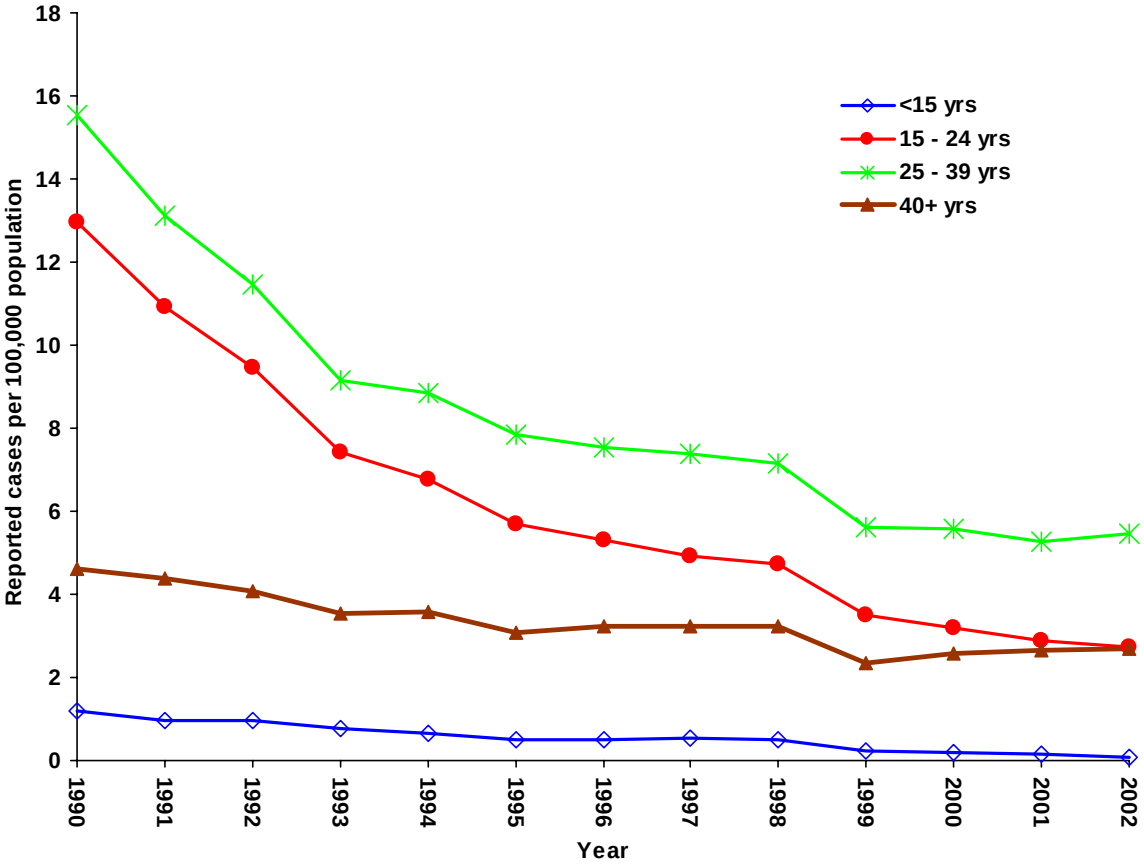
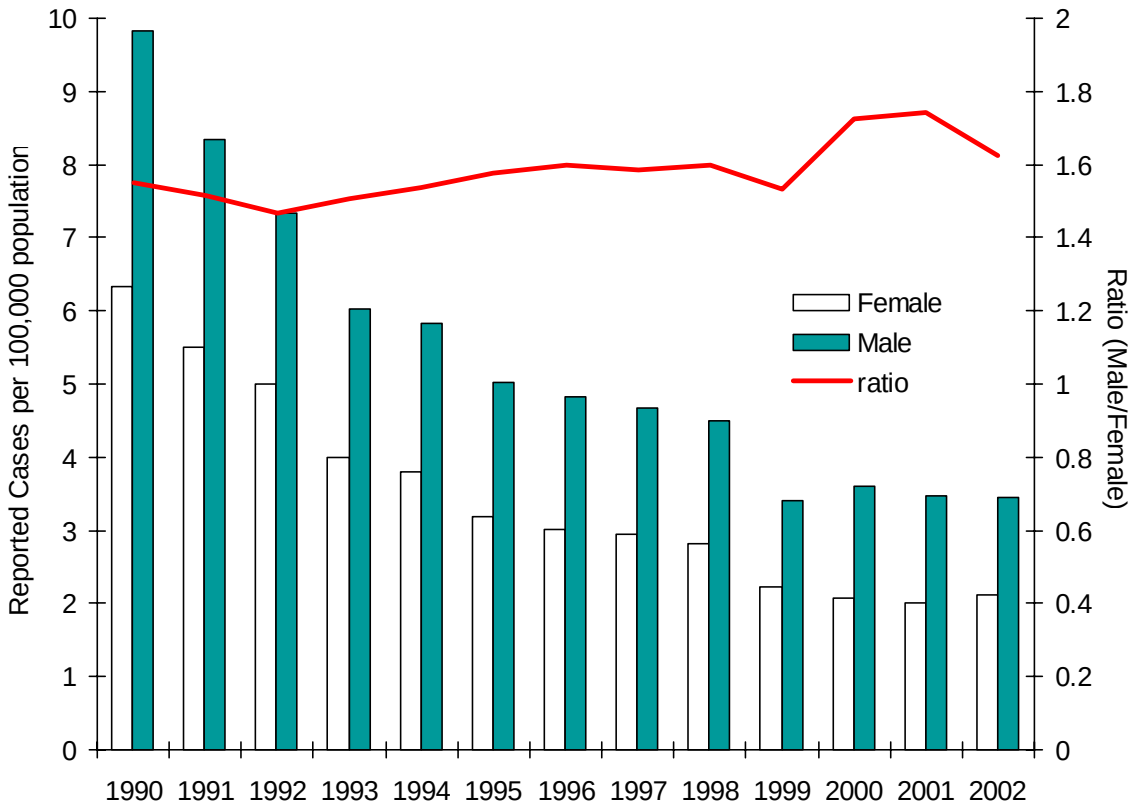


Figure 15: Incidence of Reported Acute Hepatitis B, by Sex, United States, 1990-2002



Note: The bars indicate the rate per 100,000 (the left y-axis) by gender; the line is the ratio (right y-axis) of the incidence rate among males to that among females

Figure 16: Incidence of Reported Acute Hepatitis B, by Age and Sex, United States, 2002

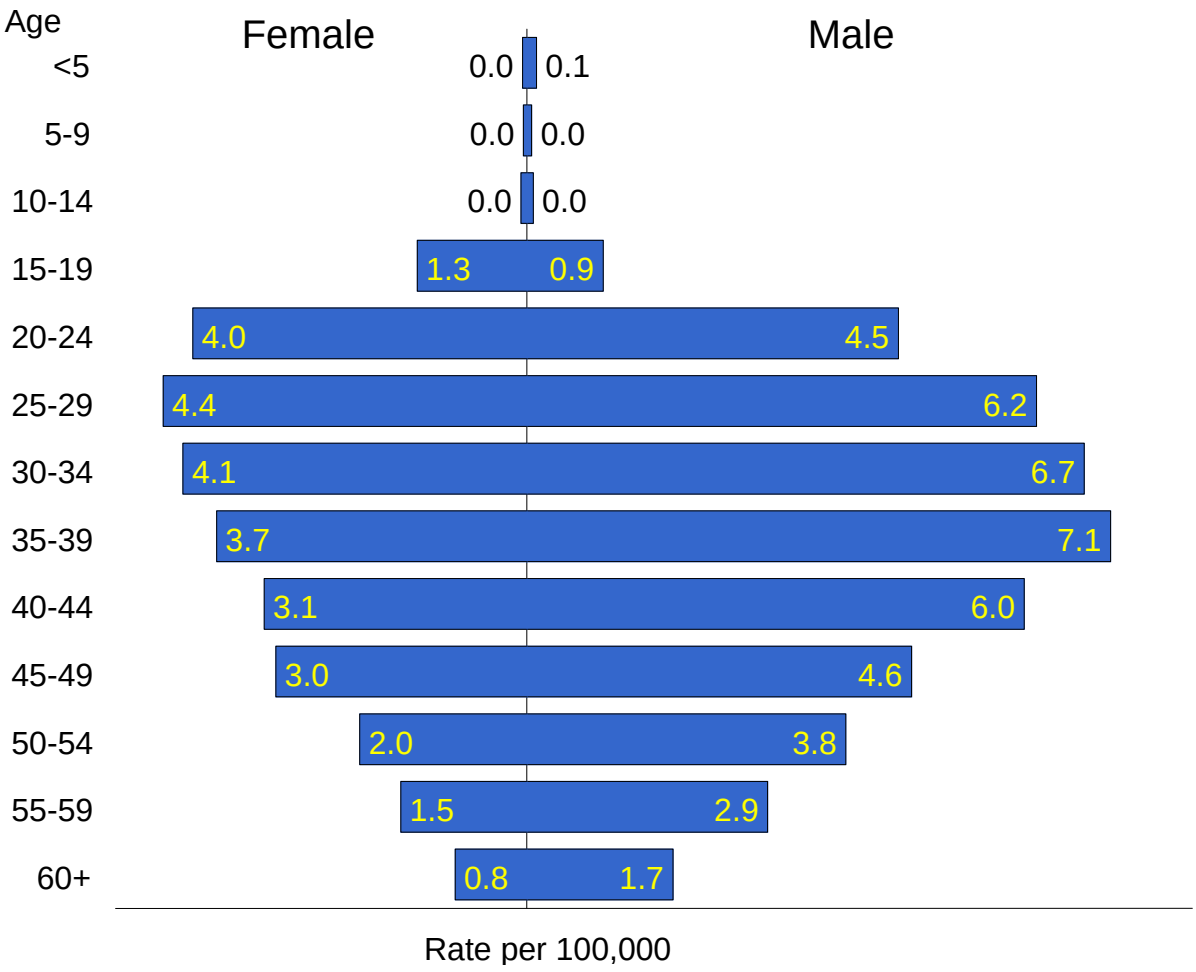


Figure 17: Incidence of Reported Acute Hepatitis B, by Race and Ethnicity, United States, 1990-2002

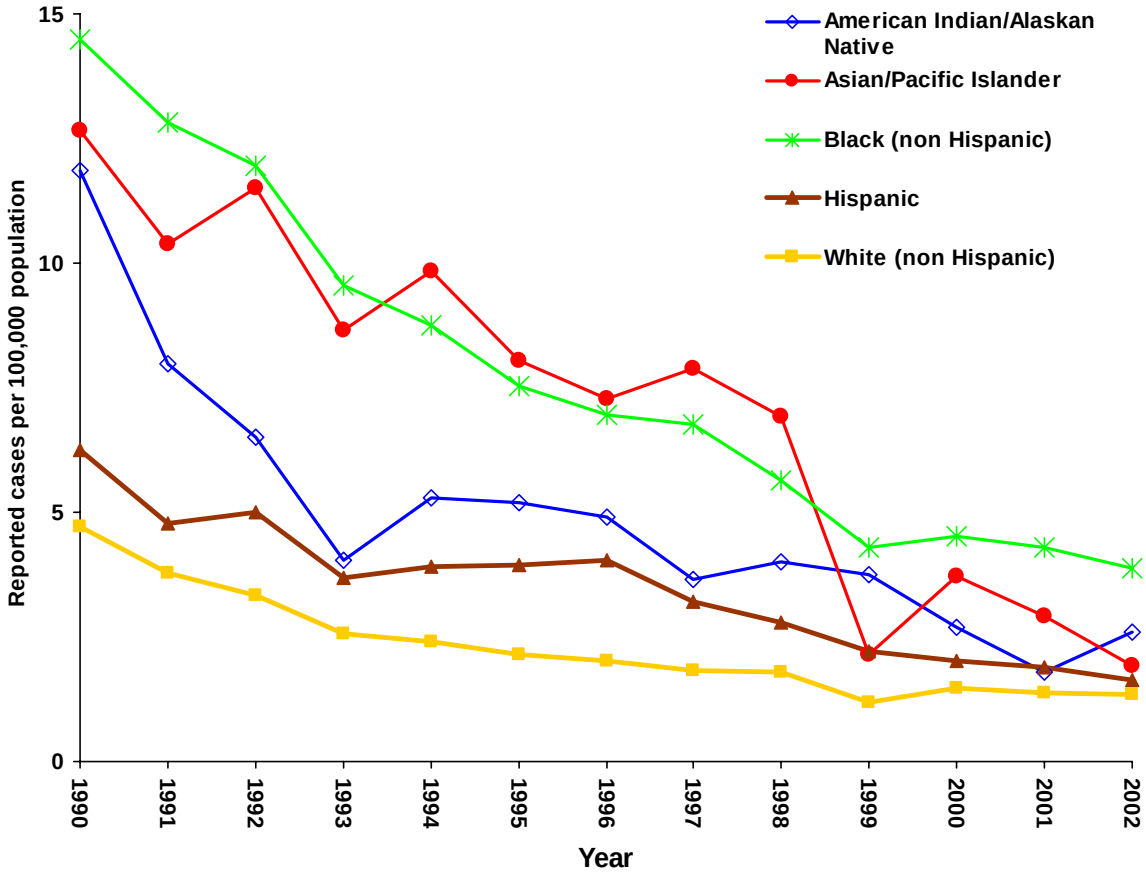


Table 7: Epidemiologic Characteristics* of Patients Reported with Acute Hepatitis B, by Age, United States, 2002 (crude frequencies)

	Age Groups					
	<40 (n=1483**)		40+ yrs (n=913)		Total (n=2396)	
	N	%	N	%	N	%
Injection drug use	229	15.4	46	5.0	275	11.5
Sexual contact with hepatitis B patient	96	6.5	39	4.3	135	5.6
Household contact of hepatitis B patient	27	1.8	21	2.3	48	2.0
Homosexual activity	175	11.8	65	7.1	240	10.0
Medical Employee with contact with Blood	5	0.3	4	0.4	9	0.4
Hemodialysis	5	0.3	6	0.7	11	0.5
Multiple sex partners†	349	23.5	141	15.4	490	20.5
Blood transfusion	4	0.3	4	0.4	8	0.3
Surgery	55	3.7	71	7.8	126	5.3
Percutaneous injury (e.g. needlestick)	29	2.0	26	2.8	55	2.3
Other reported exposures‡	281	18.9	115	12.6	396	16.5
None of the above	682	46.0	537	58.8	1,219	50.9

*****During the 6 weeks-6 months before illness onset
****** 56 (4%) of these cases were <19 years of age
†More than 1 sex partner in the 6 weeks-6 months prior to illness onset
‡Other includes: other (non-household and non-sexual) contact with a hepatitis B patient, dental /oral surgery, acupuncture, tattoo.

Note 1: A total of 8,064 cases of hepatitis B were reported. However, calculated percentages are based on case reports that included sufficient information to verify the case definition (i.e. laboratory test results, clinical characteristics) and information on age and exposure history.

Table 8: Epidemiologic Characteristics* of Patients Reported with Acute Hepatitis B, by Age, United States, 2002(mutually exclusive categories)

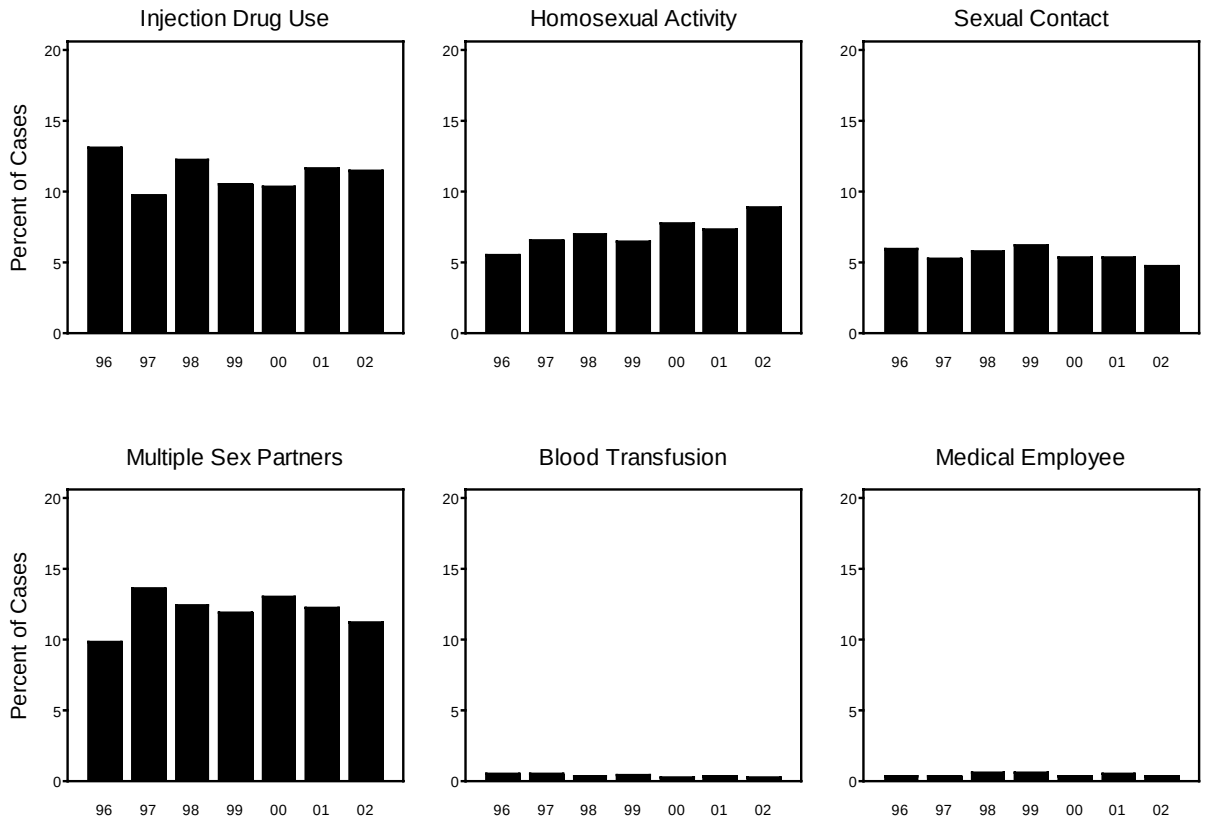
	Age Groups					
	<40 yrs**		40+ yrs		Total	
	N	%	N	%	N	%
Injection drug use	229	15.4	46	5.0	**275**	**11.5**
Sexual contact with hepatitis B patient	77	5.2	37	4.1	**114**	**4.8**
Household contact of hepatitis B patient	21	1.4	20	2.2	**41**	**1.7**
Homosexual activity§	156	10.5	58	6.4	**214**	**8.9**
Medical Employee with contact with Blood	5	0.3	4	0.4	**9**	**0.4**
Hemodialysis	1	0.1	6	0.7	**7**	**0.3**
Multiple sex partners†	175	11.8	95	10.4	**270**	**11.3**
Blood transfusion	2	0.1	4	0.4	**6**	**0.3**
Surgery	24	1.6	52	5.7	**76**	**3.2**
Percutaneous injury(e.g. needlestick)	9	0.6	7	0.8	**16**	**0.7**
Other reported exposures‡	102	6.9	47	5.1	**149**	**6.2**
None of the above	682	46.0	537	58.8	**1,219**	**50.9**
Total	**1,483**	**100.0**	**913**	**100.0**	**2,396**	**100.0**

***** During the 6 weeks-6 months before illness onset.
** 56 (4%) of these cases were <19 years of age
§Among male cases, 14% were attributed to homosexual behavior and in males <40 years of age, 17% of cases were attributed to this risk factor.
†More than 1 sex partner in the 6 weeks-6 months prior to illness onset
‡Other includes: other (non-household and non-sexual) contact with a hepatitis B patient, dental /oral surgery, acupuncture, tattoo.

Note 1: A total of 8,064 cases of hepatitis B were reported. However, calculated percentages are based on case reports that included sufficient information to verify the case definition (i.e. laboratory test results, clinical characteristics) and information on age and exposure history.

Note 2: For persons who reported multiple risk factors for hepatitis B, their source of infection is assigned to their reported risk factor that is highest in the order listed in the table above.

Figure 18: Trends in Selected Epidemiologic Characteristics among Patients Reported with Acute Hepatitis B, by Year, United States



Note: This analysis is based on the assignment of cases to mutually exclusive risk categories with the source of infection for persons reporting more than one risk factor attributed to the reported risk factor that is highest in the table on the previous page.

Table 9: Clinical Characteristics of Patients Reported with Acute Hepatitis B, by Age, United States, 2002

	<5 (n=12)		5-14 (n=12)		15-39 (n=1,856)		40-59 (n=1,013)		60+ (n=200)		All (n=3093)	
	N	%	N	%	N	%	N	%	N	%	N	%
Died From Hepatitis	0	0.0	0	0.0	12	0.6	10	1.0	10	5.0	32	1.0
Hospitalized for Hepatitis	2	16.7	4	33.3	545	29.4	319	31.5	79	39.5	949	30.7
Jaundice	5	41.7	8	66.7	1,312	70.7	627	61.9	114	57.0	2,066	66.8

Note: A total of 8,064 cases of Hepatitis B including x deaths were reported. Calculated percentages include case reports with non-missing data for age and for one or more of the outcomes of interest (i.e., jaundice, hospitalization, or death).

Acute Hepatitis C/NANB Hepatitis, 2002

Summary

With an estimated 2.7 million chronically infected persons nationwide[4], hepatitis C virus (HCV) infection is the most common chronic bloodborne infection in the United States. No effective vaccine against this infection is available. National recommendations for prevention and control of HCV infection[5] issued in 1998 rely on primary prevention activities to reduce the risk for HCV transmission. These activities include: screening and testing of blood donors, viral inactivation of plasma-derived products, risk-reduction counseling and services, and implementation and maintenance of infection control practices.

Incidence of hepatitis C has been declining since the late 1980s. This decline is largely the result of a decrease in cases reported among injecting drug users (IDU) , the reasons for which are unknown. The majority of hepatitis C cases continue to occur in adult age groups (persons >25 years of age) with injecting drug use the most commonly identified risk factor for infection. Transmission of HCV associated with transfusion, an important risk factor for infection in the past, is now rare. Ongoing surveillance is needed to ensure that any new cases of hepatitis C are identified and investigated to determine the source of infection and limit further spread of the virus.

- 1837 cases of acute hepatitis C/NANB hepatitis were reported in 2002. However, 614 (33%) of these were reported from a single state, Missouri; these reports were made on the basis of laboratory reports alone and the majority of them represent chronic rather than acute infection. Thus, all analyses excluded reports from Missouri. Based on the 1223 cases reported by all other states, the overall national rate of reported acute hepatitis C/NANB was 0.5 per 100,000. Figure 19

- Historically, because of concerns about the quality of NNDSS data, national trends in hepatitis C/NANB have been monitored using data collected through the Sentinel Counties Study of Viral Hepatitis. However, in recent years, analysis of case reports meeting the definition for acute, symptomatic hepatitis C /NANB collected through NNDSS have yielded

similar results to those from the Sentinel Counties Study, suggesting that nationally reported cases can more reliably be used to monitor trends incidence and risk factors for acute hepatitis C. Figure 19

- Rates have been declining in all age groups since the mid-1990s. The greatest decline in incidence has been among 25-39 year olds which has historically been the age group with the highest rates of disease. In this age group, incidence has declined by 86% since 1992 to 0.7/100,000 in 2002. Few cases are reported in persons <15 years of age. Figure 20

- As in previous years, the rate of hepatitis C in 2002 is higher among males (0.5 per 100,000) than among females (0.3 /100,000). The ratio of cases occurring among males to those occurring among females has remained relatively stable with a range of 1.6-1.9 during the past 5 years. This difference in hepatitis C rates by sex is evident in persons 20 years of age and older. Figure 21, Figure 22

- Incidence of hepatitis C/NANB varies by race and ethnicity. Rates have declined in all racial groups since 1995 but non-Hispanic blacks and American Indian/Alaska Natives continue to have higher incidence rates than other racial/ethnic groups. Rates among Hispanics have historically been higher than among non-Hispanic whites (but lower than for non-Hispanic blacks) but since 2000 have been lower than for any other racial/ethnic group except Asian or Pacific Islanders who continue to have the lowest incidence of hepatitis C/NANB. Figure 23

- Among cases for which information about exposures during the incubation period was determined, the most common risk factor for hepatitis C in 2002 was injection drug use. The proportion of cases attributed to injection drug use has been increasing over the past decade from 4% in 1993 to 14% in 1996 to 17% in 1998 to 26% in 2002. Another 11% of cases were attributed to sexual exposure (5% to sexual contact with a known case and 6% to a history of multiple sex partners during the incubation period). Less than 2% of cases were attributed to occupational exposure to blood. A history of transfusion or dialysis, both of which were previously important sources of HCV infection now account together for <1% of cases. No risk factor was identified for 44% of cases interviewed. Table 10, Table 11

Figure 19: Incidence of Reported Acute Hepatitis C/NANB, United States, 1982-2002

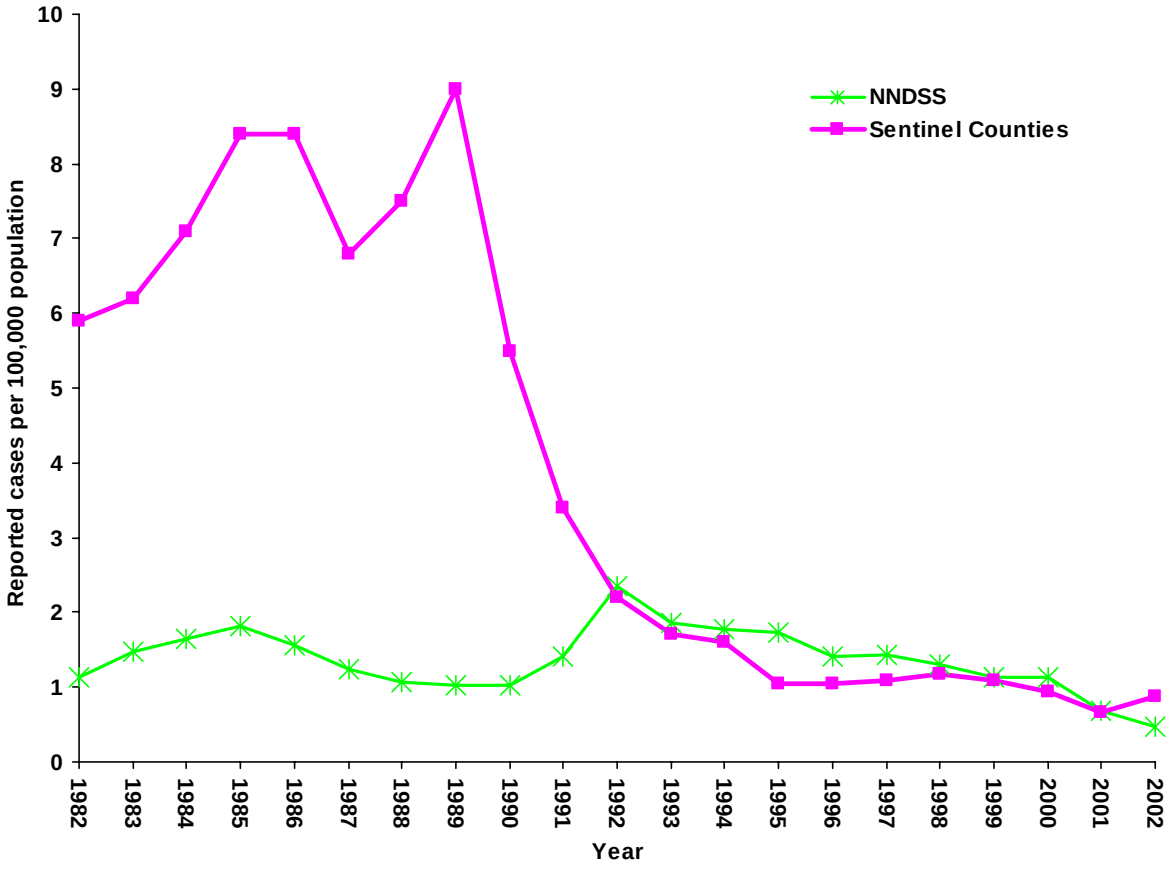


Figure 20: Incidence of Reported Acute Hepatitis C/NANB, by Age, United States, 1992-2002

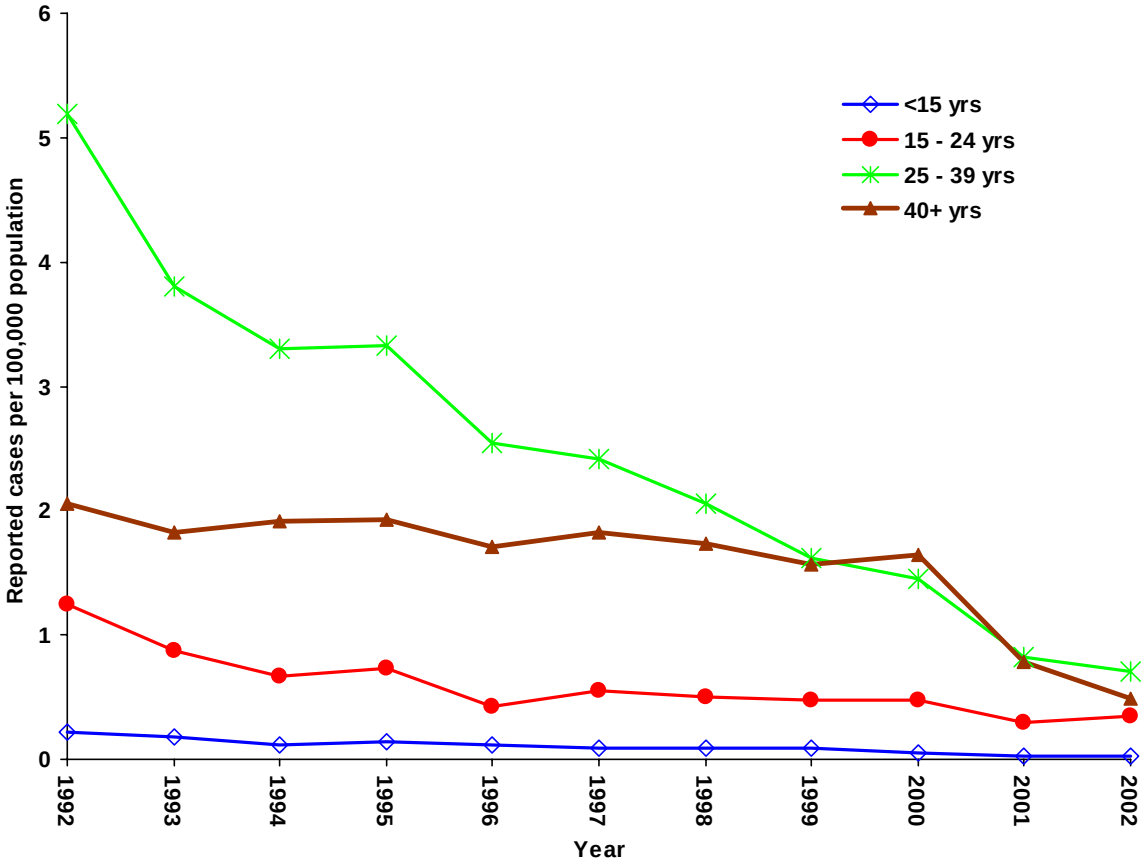


Figure 21: Incidence of Reported Acute Hepatitis C/NANB, by Sex, United States, 1992-2002

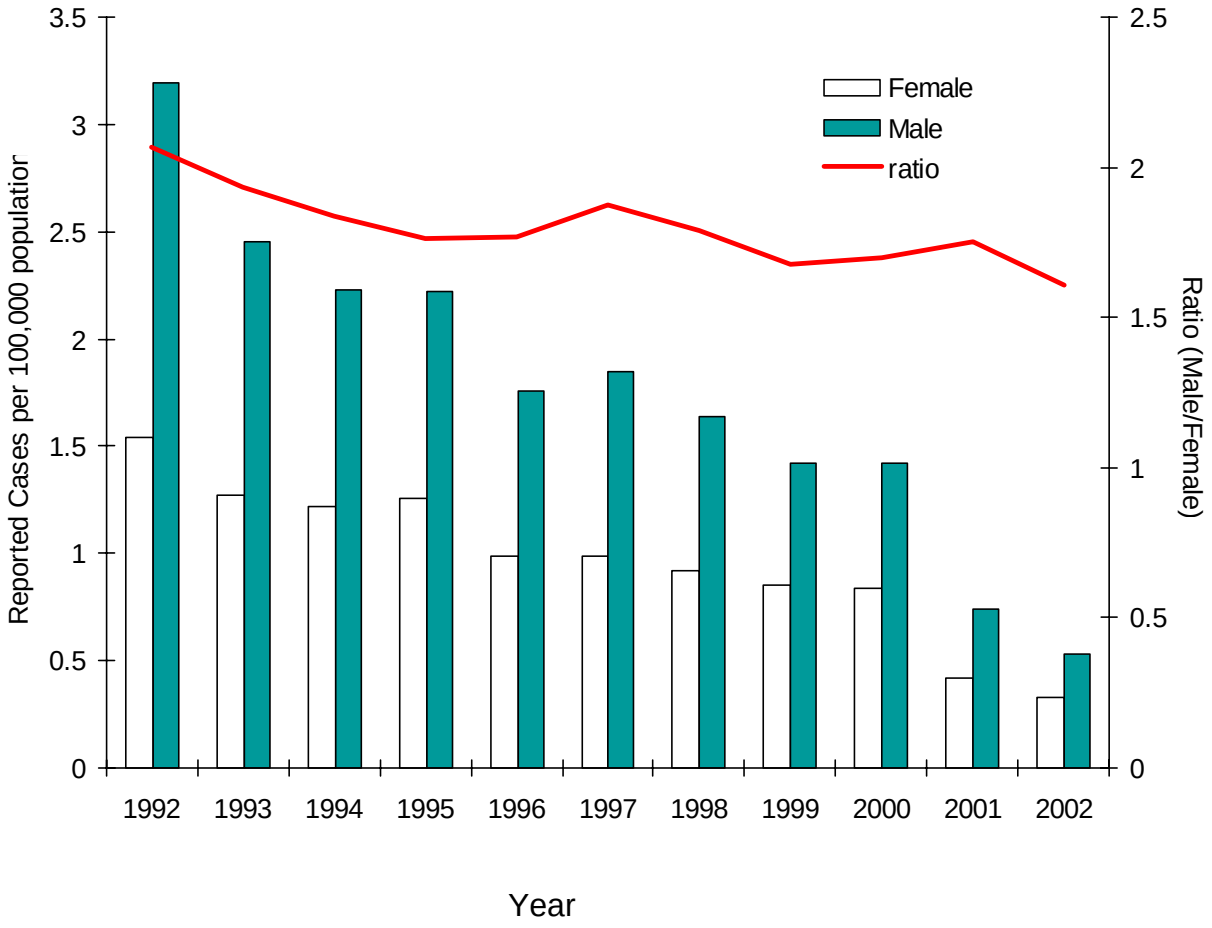


Figure 22: Incidence of Reported Acute Hepatitis C, by Age and Sex, United States, 2002

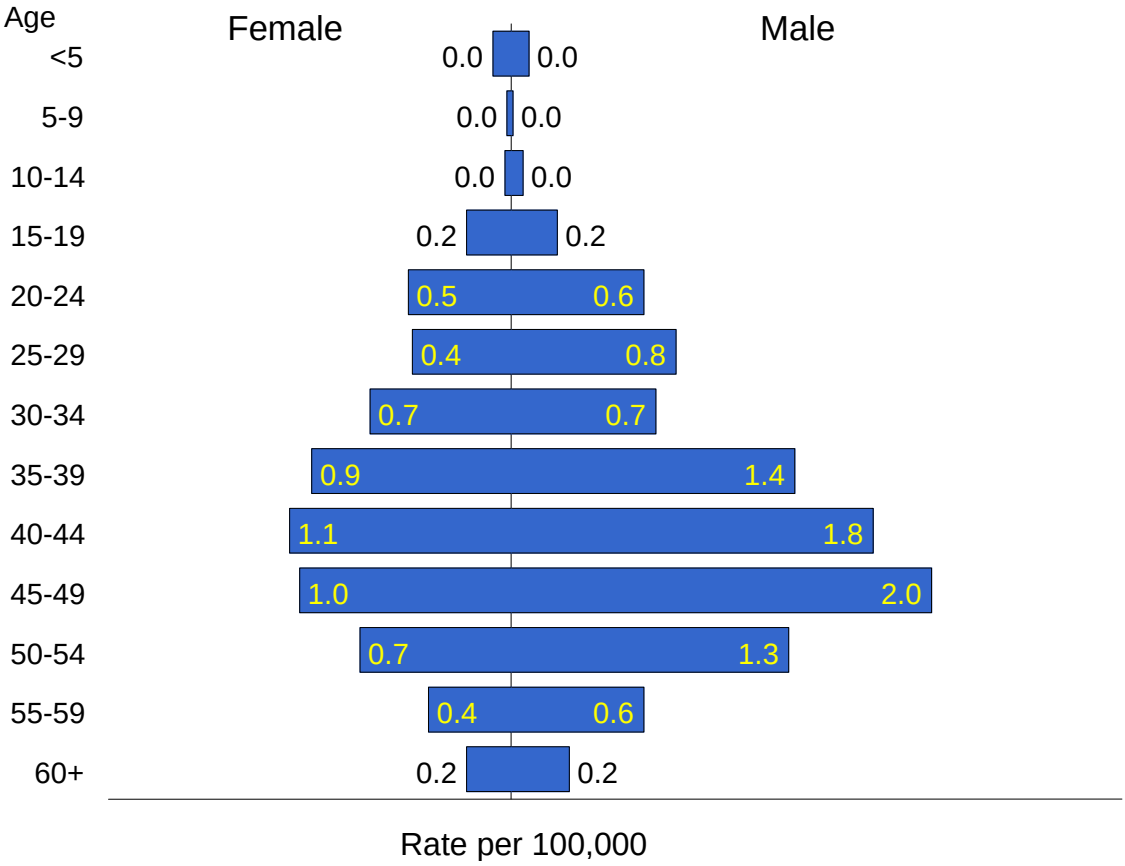


Figure 23 Incidence of Reported Acute Hepatitis C/NANB, by Race and Ethnicity, United States, 1992-2002

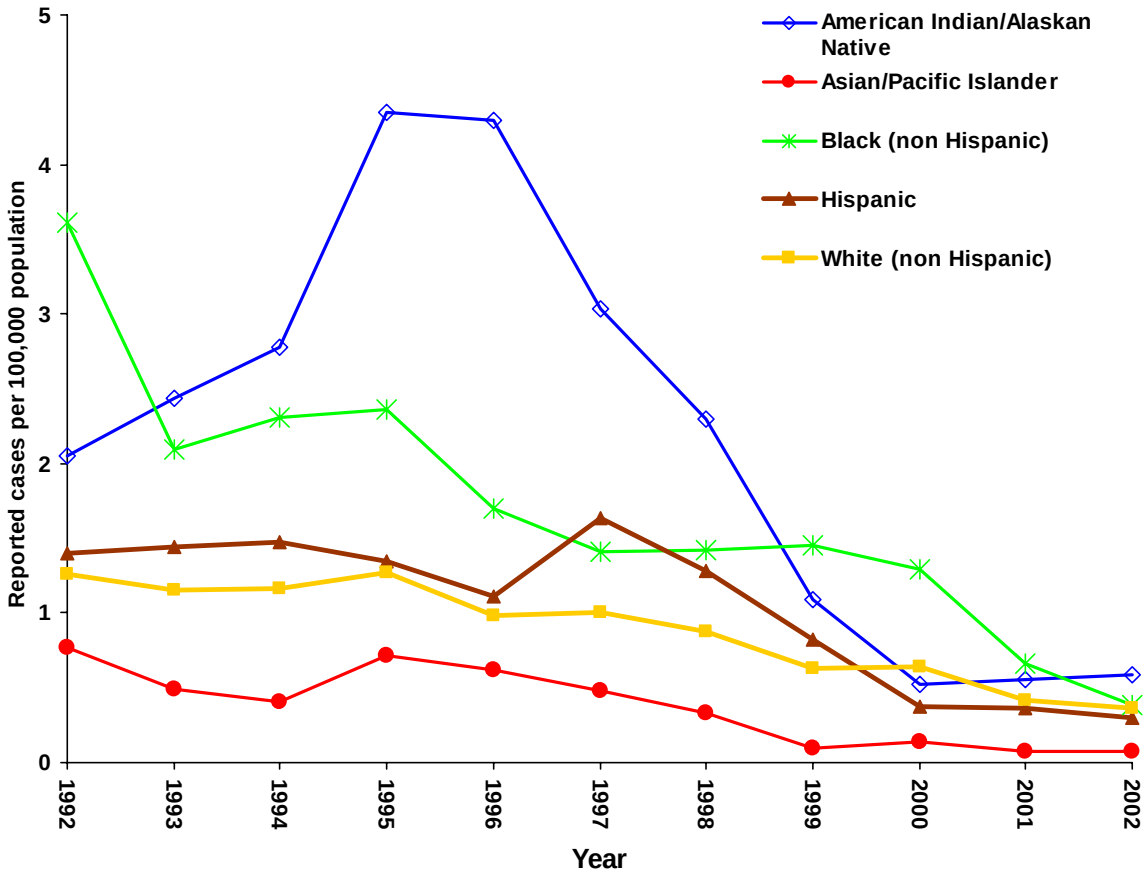


Table 10: Epidemiologic Characteristics* of Patients Reported with Acute Hepatitis C, by Age, United States, 2002 (Crude Frequency)

	Age Groups					
	<40 yrs (n=217)		40+ yrs (n=164)		Total (n=381)	
	N	%	N	%	N	%
Injection drug use	81	37.3	19	11.6	100	26.2
Employment in medical/dental field	3	1.4	4	2.4	7	1.8
Hemodialysis	1	0.5	1	0.6	2	0.5
Sexual contact with hepatitis C patient	12	5.5	12	7.3	24	6.3
Household contact of hepatitis C patient	5	2.3	3	1.8	8	2.1
Multiple sex partners†	36	16.6	21	12.8	57	15.0
Blood transfusion	.	.	1	0.6	1	0.3
Surgery	16	7.4	22	13.4	38	10.0
Percutaneous injury (e.g. needlestick)	12	5.5	8	4.9	20	5.2
Other reported exposures‡	64	29.5	32	19.5	96	25.2
Unknown	83	38.2	85	51.8	168	44.1

*****During the 6 weeks-6 months before illness onset
******15(7%) of these cases were <19 years of age
†More than one sex partner
‡ Other: Case reported one or more of the following exposures: other non-household, non-sexual contact with another hepatitis case, dental or oral surgery, acupuncture, tattooing

Note: A total of 1,223 cases of hepatitis C/NANB were reported. However, calculated percentages are based on case reports that included sufficient information to verify the case definition (i.e. laboratory test results, clinical characteristics) and exposure information.

Table 11: Epidemiologic Characteristics* of Patients Reported with Acute Hepatitis C by Age, United States, 2002 (mutually exclusive categories)

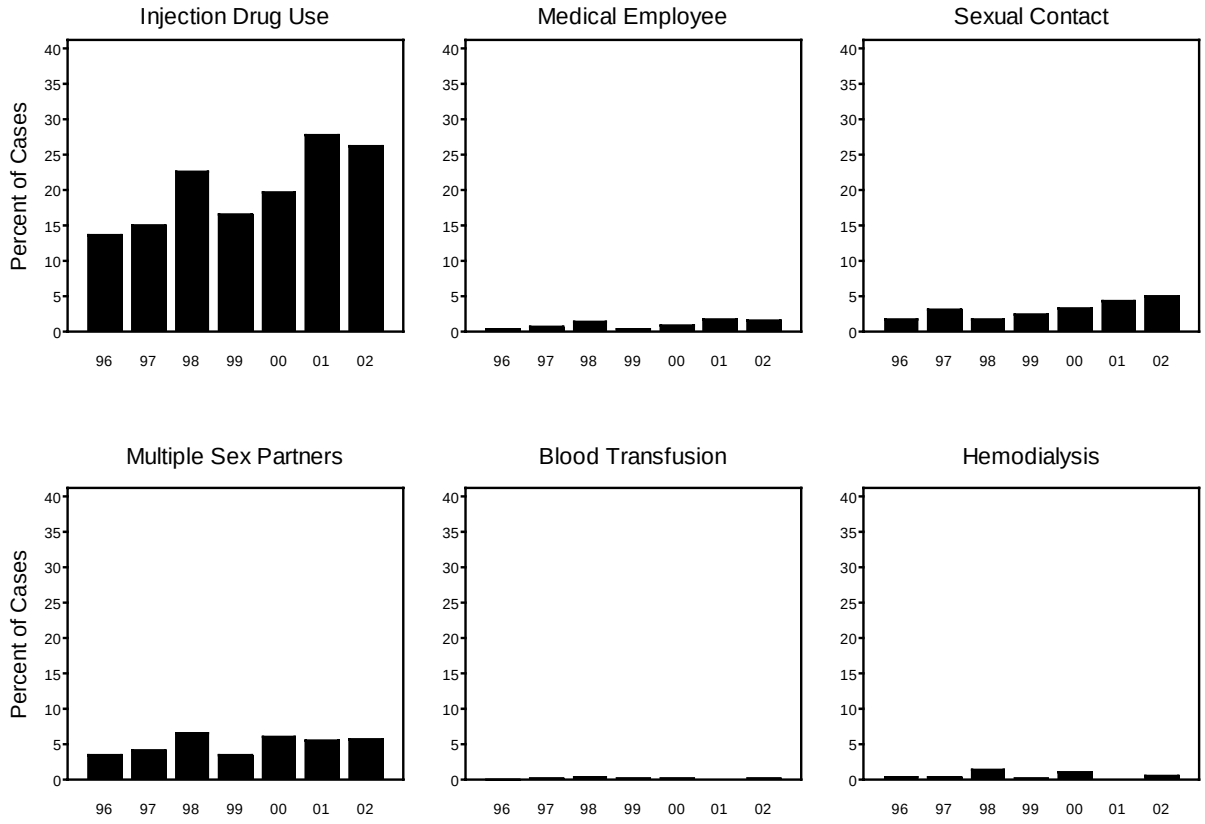
	Age Groups					
	<40 yrs		40+ yrs		Total	
	N	%	N	%	N	%
Injection drug use	81	37.3	19	11.6	**100**	**26.2**
Employment in medical/dental field	2	0.9	4	2.4	**6**	**1.6**
Hemodialysis	1	0.5	1	0.6	**2**	**0.5**
Sexual contact with hepatitis C patient	8	3.7	11	6.7	**19**	**5.0**
Household contact of hepatitis C patient	1	0.5	3	1.8	**4**	**1.0**
Multiple sex partners†	12	5.5	10	6.1	**22**	**5.8**
Blood transfusion	.	.	1	0.6	**1**	**0.3**
Surgery	6	2.8	16	9.8	**22**	**5.8**
Percutaneous injury (e.g. needlestick)	2	0.9	2	1.2	**4**	**1.0**
Other reported exposures‡	21	9.7	12	7.3	**33**	**8.7**
Unknown	83	38.2	85	51.8	**168**	**44.1**
Total	**217**	**100.0**	**164**	**100.0**	**381**	**100.0**

*****During the 6 weeks – 6 months before illness onset
†More than one sex partner
‡Other: Case reported one or more of the following exposures: other non-household, non-sexual contact with another hepatitis case, dental or oral surgery, acupuncture, tattooing.

Note 1: A total of 1,223 cases of hepatitis C/NANB were reported. However, calculated percentages are based on case reports that included sufficient information to verify the case definition (i.e. laboratory test results, clinical characteristics) and exposure information.

Note 2: For persons who reported multiple risk factors for hepatitis C/NANB, their source of infection is assigned to their reported risk factor that is highest in the order listed in the table above **.**

Figure 24: Trends in Selected Epidemiologic Characteristics among Patients Reported with Acute Hepatitis C/NANB, by Year



Note: This analysis is based on the assignment of cases to mutually exclusive risk categories with the source of infection for persons reporting more than one risk factor attributed to the reported risk factor that is highest in the table on the previous page.

Table 12: Clinical Characteristics of Patients Reported with Acute Hepatitis C by Age, United States, 2002

	Age Group								Total	
	5-14 (n=1)		15-39 (n=281)		40-59 (n=189)		60+ (n=23)		All (n=501)	
	N	%	N	%	N	N	%	N	%	N
Died From Hepatitis	0	0.0	0	0.0	3	1.6	1	4.3	4	0.8
Hospitalized for Hepatitis	0	0.0	85	30.2	58	30.7	8	34.8	153	30.5
Jaundice	0	0.0	147	52.3	95	50.3	10	43.5	254	50.7

Note: A total of 1,223 cases of Hepatitis C/NANB were reported. Calculated percentages include patients with non-missing data for age and for one or more of the outcomes of interest (i.e., jaundice, hospitalization, and death).

Future Directions

Surveillance for acute viral hepatitis

Hepatitis A: Continued monitoring of national and state-specific incidence rates is needed to determine if the dramatic decline in rates that has occurred following introduction of hepatitis A vaccines in this country is sustained and the extent to which it is attributable to vaccination. Enhanced investigation of cases reported in children living in states included in the recommendations for routine childhood hepatitis A vaccination and in other groups for which vaccination is recommended (e.g. travelers, men who have sex with men) is needed to determine if and why these individuals were not vaccinated so that additional cases can be prevented.

Hepatitis B: The analysis of surveillance data will continue to provide critical information to assess the impact of the national strategy for eliminating HBV transmission in the United States. With ongoing vaccination of infants and children, it is expected that the number of cases occurring in young age groups will continue to decline. Enhanced investigation of cases reported in children and other groups for which vaccination is recommended (e.g. health care workers, men who have sex with men) is needed to determine if and why these individuals were not vaccinated so that additional cases can be prevented. In addition, the investigation of cases occurring in risk groups can identify settings in which these individuals might be reached with vaccine. The investigation of new cases identified in older persons or others who do not have typical risk factors (e.g., multiple sex partners, recent IDU) for HBV should be done to identify outbreaks associated with health care or other unusual settings.

Hepatitis C/NANB: The incidence of acute hepatitis C continues to decline and outbreaks are rare. However, the investigation of any new infection is needed to identify and control ongoing sources of transmission. In particular, investigation of new cases occurring in persons who do not have typical risk factors (e.g., recent IDU) for HCV infection is needed to identify outbreaks associated with health care or other unusual settings. Case investigation efforts should be focused on the investigation of cases of acute disease or documented cases of seroconversion.

Surveillance for perinatal HBV infection: Reporting of perinatal HBV infection through NETSS began in 2001. In 2001, a total of 30 cases were reported by seven states; in 2002, the number of states reporting increased to 17 with a total of 63 cases reported. However, not all states have begun reporting through this mechanism. Based on estimations made using other data sources[6], approximately 1000 infants were infected with HBV in 2001 of whom 80% will remain chronically infected. Once reporting mechanisms are stabilized, analysis of reported cases will be included as part of this report.

Surveillance for chronic hepatitis virus infections: To date, national surveillance has been conducted for cases of acute disease only. However, in June 2002, the Council of State and Territorial Epidemiologists voted to include chronic HBV infection and HCV infection (past or present) in the list of nationally notifiable diseases and approved a case definition for each of these conditions. Since January 2003, 20 states have begun reporting these cases electronically through NETSS to CDC. Once reporting mechanisms are stabilized, these reports will be evaluated and included as part of this report. The approved case definitions for chronic HBV infection and HCV infection (past or present) are available at www.cdc.gov/epo/dphsi/casedef/. The identification and reporting of chronically infected persons is needed to facilitate follow-up of these individuals to ensure that they are receiving appropriate interventions including counseling and referral for medical evaluation. In addition, it will allow states to determine the characteristics of persons being identified with chronic infection and provide data that can be used to describe the local burden of disease due to HBV and HCV infection.

Appendices

Appendix I: State and Territorial Epidemiologists and Laboratory Directors

State and Territorial Epidemiologists and Laboratory Directors are acknowledged for their contributions to hepatitis surveillance programs. The epidemiologists and the laboratory directors listed below were in the positions shown as of July 2003.

State/Territory	State Epidemiologist	State Laboratory Director
Alabama	J.P. Lofgren	William J Callan
Alaska	John Middaugh	Bernard Jilly
Arizona	Bob England	Wesley Press
Arkansas	Frank Wilson	Michael Loeffelholz
California	Gilberto Chavez	Paul Kimsey
Colorado	Ned Calonge	David Butcher
Connecticut	James Hadler	Katherine Kelley
Delaware	A. LeRoy Hathcock	Jane Getchell
District of Columbia	John Davies-Cole	Maurice Knuckles
Florida	Landis Crocket	Ming S Chan
Georgia	Paul Blake	Elizabeth Franko
Hawaii	Paul Effler	Vernon Miyamoto
Idaho	Christine Hahn	Richard Hudson
Illinois	Mark Dworkin	David Maserang
Indiana	Robert Teclaw	David Nauth
Iowa	Patricia Quinlisk	Mary Gilchrist
Kansas	Gianfranco Pezzino	Duane Boline
Kentucky	Kraig Humbaugh	George Graham
Louisiana	Raoult Ratard	Henry Bradford Jr.
Maine	Kathleen Gensheimer	John Krueger
Maryland	David Blythe	Jack Deboy
Massachusetts	Alfred Demaria Jr.	Ralph Timperi
Michigan	Matthew Boulton	Francis P Downes
Minnesota	Harry Hull	Norman Crouch
Mississippi	Mills McNeill	Joe Graves
Missouri	Bao-Ping Zhu	Eric Blank
Montana	Todd Damrow	Michael Spence
Nebraska	Thomas Safranek	Steve H Hinrichs
Nevada	Randall Todd	L. Dee Brown
New Hampshire	Jesse Greenblatt	Veronica C Malmberg
New Jersey	Eddy A Bresnitz	Dennis Flynn
New Mexico	C. Mack Sewell	David E Mills
New York City	Marci Layton	
New York State	Perry Smith	Lawrence Sturman
North Carolina	Jeff Engel	Lou F Turner
North Dakota	Larry Shireley	Bonna Cunningham
Ohio	Forrest Smith	William Becker
Oklahoma	Kristy Bradley	John J Mathewson
Oregon	Melvin Kohn	Michael Skeels
Pennsylvania	James Rankin	Bruce Kleger
Rhode Island	Utpala Bandy	Gregory Hayes
South Carolina	James J. Gibson	Harold Dowda
South Dakota	Lon Kightlinger	Michael Smith
Tennessee	Allen Craig	Michael W Kimberly
Texas	Dennis Perrotta	Susan Neill
Utah	Robert Rolfs	Charles Brokopp
Vermont	Cortland Lohff	Mary Celotti
Virginia	John Marr	James L Pearson
Washington	Jo Hofmann	Romesh Gautom
West Virginia	Loretta Haddy	Andrea Labik
Wisconsin	Jeffrey Davis	Ronald H Laessig
Wyoming	Karl Musgrave	Richard Harris
American Samoa	Joseph Tufa	Joseph Tufa
Federated States of Micronesia	Jean-Paul Quez	
Guam	Robert Haddock	Peter John Camacho
Marshall Islands	Helen Jetnil	
Northern Mariana Island	James Hosfschneider	Joseph Villagomez
Puerto Rico	Francisco Alvarado-Ramy	Jose L Molinaris
Virgin Islands	Mavis Matthew	Norbert Mantor

Appendix II: Viral Hepatitis Case Report Form

VIRAL HEPATITIS CASE RECORD
FOR REPORTING OF PATIENTS WITH SYMPTOMATIC ACUTE VIRAL HEPATITIS
(SEE CASE DEFINITION ON REVERSE)

STATE GEOGRAPHIC CODE (1) (2) (3) (4) (5)
STATE CASE NO. (8) (9) (10) (11)

DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
Centers for Disease Control and Prevention
Hepatitis Branch, (G37)
Atlanta, Georgia 30333

CDC CASE NO. (8) (9) (10) (11)

PATIENT'S LAST NAME (please print clearly) (12-26) | FIRST AND MIDDLE NAME (or initials) | OCCUPATION

STREET ADDRESS | TOWN OR CITY | STATE (Zip Code) | COUNTY (27-36) | COUNTY FIPS CODE (37-40)

AGE (yrs) (41-42) ___ ___ 00 = < 1yr 99 = Unk

DATE OF BIRTH (43-48) __ __ / __ __ / __ __ Mo Day Yr

SEX (49) 1 ☐ Male 2 ☐ Female 9 ☐ Unk

RACE (50) 1 ☐ American Indian or Alaskan Native 2 ☐ Asian or Pacific Islander 3 ☐ Black 5 ☐ White 9 ☐ Unk

ETHNICITY (51) 1 ☐ Hispanic 2 ☐ Non-Hispanic 9 ☐ Unk

Reporting physician's diagnosis (52-53) 1 ☐ Hepatitis A 2 ☐ Hepatitis B 3 ☐ Non-A, Non-B Hepatitis 4 ☐ Hepatitis D (Delta) 5 ☐ Hepatitis Unspecified

DO NOT REPORT CASES OF CHRONIC HEPATITIS OR CHRONIC CARRIERS!!

CLINICAL DATA

	Mo	Day	Yr
Date of first symptom (54-59)	__ __ /	__ __ /	__ __
Date of diagnosis (60-65)	__ __ /	__ __ /	__ __

Was the patient jaundiced? (66) 1 ☐ Yes 2 ☐ No
Was the patient hospitalized for hepatitis? (67) 1 ☐ Yes 2 ☐ No
Did the patient die from hepatitis? (68) 1 ☐ Yes 2 ☐ No

LABORATORY RESULTS

	Pos	Neg	Not Tested/Unk
IgM Hepatitis A antibody (IgM anti-HAV) (69)	1 ☐	2 ☐	9 ☐
Hepatitis B surface antigen (HBsAg) (70)	1 ☐	2 ☐	9 ☐
IgM Hepatitis B core antibody (IgM anti-HBc) (71)	1 ☐	2 ☐	9 ☐
Antibody to Delta (anti-HDV) (72)	1 ☐	2 ☐	9 ☐

For purposes of National Surveillance, ASK ALL OF THE FOLLOWING QUESTIONS FOR EVERY CASE OF HEPATITIS. These questions may help determine where the patient acquired his/her infection. Please refer to the work sheet on the back of the last page for additional questions.

	Yes	No	Unk
During the 2-6 weeks prior to illness			
1. was the patient a child or employee in a nursery, day care center, or preschool? (73)	1 ☐	2 ☐	9 ☐
2. was the patient a household contact of a child or employee in a nursery, day care center, or preschool? (74)	1 ☐	2 ☐	9 ☐
3. was the patient a contact of a confirmed or suspected hepatitis A case? (75)	1 ☐	2 ☐	9 ☐
If yes, type of contact: (76) 1 ☐ Sexual 2 ☐ Household (non-sexual) 3 ☐ Other			
4. was the patient employed as a food handler? (77)	1 ☐	2 ☐	9 ☐
5. did the patient eat raw shellfish? (78)	1 ☐	2 ☐	9 ☐
6. was the patient suspected as being part of a common-source foodborne or waterborne outbreak? (79)	1 ☐	2 ☐	9 ☐
7. did the patient travel outside of the U.S. or Canada? (80)	1 ☐	2 ☐	9 ☐
If yes, where: (81) 1 ☐ So./Central America (including Mexico) 2 ☐ Africa 3 ☐ Caribbean 4 ☐ Middle East 5 ☐ Asia/So. Pacific 6 ☐ Australia/New Zealand 7 ☐ Other_____			
Duration of stay: (82) 1 ☐ 1-3 Days 2 ☐ 4-7 Days 3 ☐ More than 7 Days			
During the 6 weeks-6 months prior to illness			
8. was the patient a contact of a confirmed or suspected acute or chronic hepatitis B or non-A, non-B case? (83)	1 ☐	2 ☐	9 ☐
If yes, type of contact: (84) 1 ☐ Sexual 2 ☐ Household (non-sexual) 3 ☐ Other			
9. was the patient employed in a medical, dental or other field involving contact with human blood? (85)	1 ☐	2 ☐	9 ☐
If yes, degree of blood contact: (86) 1 ☐ Frequent (several times weekly) 2 ☐ Infrequent			
10. did the patient receive blood or blood products (transfusion)? (87)	1 ☐	2 ☐	9 ☐
If yes, specify date(s) received: (88-93) From ___ ___/___ ___/___ ___ to ___ ___/___ ___/___ ___ (94-99)			
11. was the patient associated with a dialysis or kidney transplant unit? (100)	1 ☐	2 ☐	9 ☐
If yes, (101) 1 ☐ Patient 2 ☐ Employee 3 ☐ Contact of patient or employee			
12. did the patient use needles for injection of street drugs? (102)	1 ☐	2 ☐	9 ☐
13. what was the patient's sexual preference? (103) 1 ☐ Heterosexual 2 ☐ Homosexual 3 ☐ Bisexual 9 ☐ Unk			
14. how many different sexual partners did the patient have? (104) 1 ☐ None 2 ☐ One 3 ☐ 2-5 4 ☐ More than 5 9 ☐ Unk			
15. did the patient have			
dental work or oral surgery? (105) 1 ☐ Yes 2 ☐ No 9 ☐ Unk tattooing? (108)	1 ☐	2 ☐	9 ☐
other surgery? (106) 1 ☐ Yes 2 ☐ No 9 ☐ Unk an accidental stick or puncture with a needle			
acupuncture? (107) 1 ☐ Yes 2 ☐ No 9 ☐ Unk or other object contaminated with blood? (109)	1 ☐	2 ☐	9 ☐
Has this patient ever received the three dose series of Hepatitis B vaccine? (110)	1 ☐	2 ☐	9 ☐
If yes, what year? (111-112) ___ ___ AND was the patient tested for antibody within 1-6 months after the last dose? (113)	1 ☐	2 ☐	9 ☐
If yes, was the antibody test: (114) 1 ☐ Pos 2 ☐ Neg 3 ☐ Unknown			

Comments:

Investigator's Name

Date

CDC 53.1 Rev. 6-93

Form Approved
OMB No. 0920-0009

References

[1] CDC. Prevention of hepatitis A through active or passive immunization. MMWR 1996; 45(RR:15)

[2] CDC. Prevention of hepatitis A through active or passive immunization. MMWR 1999; 48(RR:12)

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[4] Alter, MJ et al. The prevalence of hepatitis C virus infection in the United States. N Engl J Med 1999; 341:556-62.

[5] CDC. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR 1998; 47(RR:19)

[6] U.S. Department of Health and Human Services. Healthy People 2010. 2nd ed. (Washington, DC: U.S. Government Printing Office, November 2000)