Determinants of Hepatitis B Vaccination Among Adults in the United States: NHANES 1999-2006

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INTRODUCTION

•Hepatitis B is a potentially life-threatening liver infection caused by the hepatitis B virus (HBV) and a major global health problem.

•Approximately 1.3 million people living with chronic HBV in the US.

•Adult transmission occurs principally among unvaccinated adults with risk behaviors for HBV transmission (e.g., heterosexuals with multiple sex partners, injection-drug users [IDUs], and men who have sex with men [MSM]) and horizontal transmission.

•In order to meet Healthy People 2010 objectives related to Hepatitis B vaccination among adults with high risk behaviors, we performed an analysis of the factors that affect vaccination rates between 1999 and 2006.

OBJECTIVES

•To estimate the prevalence of vaccination and HBV infection status of adults and to evaluate the trend in self reported vaccination and seroprevalence for Hepatitis B for this population

•To assess the association between vaccination rates, seroprevalence, demographic, and socioeconomic characteristics

METHODS

•National Health and Nutrition Examination Survey (NHANES) 1999-2006

•Inclusion criteria

- •Adults aged 20-59 years who contributed data via the household interview and laboratory component
- •Answered all questions related to sexual practices and illegal drug use
- •Provided specimens for HBV, HCV, HIV

•Outcome variables

- •"Have you ever received the 3-dose series of the hepatitis B vaccine?".[14-17] Those who answered yes to "less than three doses" and "at least three doses" were classified as vaccinated.
- •Vaccination status was also verified through serologic markers: HBsAg, anti-HBc, and anti-HBs. Serologic status was classified as vaccinated (immune due to Hepatitis B vaccination), unvaccinated (susceptible), and history of Hepatitis B infection (immune due to natural infection)

•Determinants: age, gender, race/ethnicity, location of birth, education level, marital status, age at first intercourse, sexual orientation, household size, annual household income, insurance status, health care access, health status, history of alcohol abuse, and current tobacco use

•Logistic regression model weighted to consider the complex weighting scheme and adjusted to the 2000 US census population

Table 1. Comparison of adults vaccinated and unvaccinated for hepatitis B virus: NHANES 1999-2006

unweighted n=2220 vaccinated, n=5053 unvaccinated; weighted n=30,276,510 vaccinated, n=68,986,610 unvaccinated

	Vaccinated %	Unvaccinated %		Vaccinated %	Unvaccinated %
Variables			Variables		
Gender			Income		
Male	41.90	53.79	Less than $20,000	14.03	13.45
Female	58.10	46.21	$20,000 or more	85.97	86.55
Age			Current health insurance		
20-29	32.10	15.95	Yes	82.25	79.72
30-39	27.80	25.45	No	17.75	20.28
40-49	25.13	32.26	Source of usual care		
50-59	14.97	26.34	Yes	86.18	82.54
Race/ethnicity			No	13.82	17.46
Non-Hispanic White	73.22	75.86	Received at least 1 dose		
Non-Hispanic Black	10.66	8.66	High risk	16.02	14.65
Hispanic	11.25	12.03	Low risk	83.98	85.35
Other	4.87	3.45			
Education					
Less than high school	10.02	15.04			
Completed high school	19.49	27.45			
Some college or beyond	70.49	57.51			

Table 3. Distribution of participants based on their self report vaccination status and serostatus

	All 3 doses	At least 1 dose	No doses
Weighted sample	n=17396837	n=2520503	n=52820410
Serostatus	%	%	%
Vaccinated	46.87	23.07	4.51
Unvaccinated	48.98	73.41	91.99
History of HBV infection	4.16	3.51	3.50

RESULTS

• 30.5% of adults aged 20 to 59 from 1999-2006 reported receiving the hepatitis B vaccine

•Vaccination rate increased by almost 15 percentage points between 1999-2000 and 2005-2006

•Non-Hispanic blacks and other minorities were more likely to be vaccinated than Non-Hispanic whites and Hispanics

•Lower odds of vaccination were found with education of high school or less and lack of health insurance coverage and a source of usual care

•15 million adults were at risk of HBV, but only 32% were reported vaccination

•Factors that had little or no impact on vaccination status included country of birth, income, self reported health status, being a smoker, or having a history of alcohol abuse

DISCUSSION AND CONCLUSIONS

•NHANES data are representative of the civilian non-institutionalized US population.

•Population was limited to adults aged 20-59 who provided responses to sensitive questions regarding sexual practices, illegal drug use, also provided laboratory examination data for HBV, HCV, and HIV

•Being high risk was not associated with higher odds of vaccination, and high risk adults remain under-immunized

•The rise in vaccination rates in young adults is mostly related to childhood immunization strategies and not strategies aimed at adults

•Older males, those with less than high school education, without health insurance coverage and a source of usual care were least likely to be vaccinated.

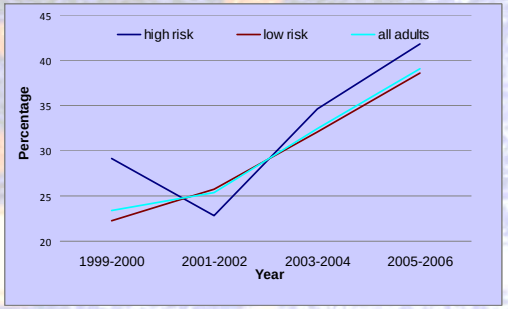
•More targeted interventions similar to children's immunizations are needed to educate and vaccinate the adult population and to create a means for identifying those at risk and those already vaccinated

•Interventions should also be implemented to improve adult awareness about vaccinations that may have already received

Table 2. Factors associated with receipt of hepatitis B vaccination among adults: NHANES 1999-2006

	Odds Ratios			
	Crude (95% CI)		Adjusted (95% CI)	
Variables				
Gender				
Male	**0.62**	**(0.56, 0.69)**	**0.64**	**(0.57, 0.73)**
Female	1.00			
Age				
20-29	**3.54**	**(2.98, 4.21)**	**3.69**	**(2.98, 4.56)**
30-39	**1.92**	**(1.61, 2.30)**	**1.85**	**(1.53, 2.24)**
40-49	**1.37**	**(1.15, 1.63)**	**1.30**	**(1.10, 1.54)**
50-59	1.00		1.00	
Race/ethnicity				
Non-Hispanic White	1.00		1.00	
Non-Hispanic Black	**1.28**	**(1.10, 1.48)**	**1.22**	**(1.03, 1.43)**
Hispanic	0.97	(0.82, 1.14)	1.11	(0.92, 1.35)
Other	**1.46**	**(1.15, 1.86)**	**1.40**	**(1.06, 1.83)**
Education				
Less than high school	0.54	(0.46, 0.65)	**0.51**	**(0.41, 0.64)**
Completed high school	0.58	(0.50, 0.67)	**0.56**	**(0.47, 0.66)**
Some college or beyond	1.00		1.00	
Current health insurance				
Yes	**1.18**	**(1.01, 1.37)**	**1.20**	**(0.99, 1.45)**
No	1.00			
Source of usual care				
Yes	**1.32**	**(1.11, 1.57)**	**1.35**	**(1.11, 1.64)**
No	1.00			
Received at least 1 dose Hepatitis B vaccine				
High risk	1.11	(0.93, 1.32)	1.10	(0.91, 1.34)
Low risk	1.00			

Figure 1. Trends in self-reported hepatitis B vaccination among adults: NHANES 1999-2006



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