

# Hepatitis B Foundation

## Annual Progress Report: 2010 Formula Grant

### Reporting Period

January 1, 2011 – June 30, 2011

### Formula Grant Overview

The Hepatitis B Foundation received \$ 859 in formula funds for the grant award period January 1, 2011 through December 31, 2011. Accomplishments for the reporting period are described below.

### **Research Project 1: Project Title and Purpose**

*Determining Correlates of Hepatitis B Status Among High-Risk Asian and Pacific Islanders in Pennsylvania* - The purpose of this project is to determine the sociocultural and demographic determinants associated with hepatitis B virus (HBV) infection or protection status among high-risk Asian and Pacific Islander (API) communities in Southeastern Pennsylvania. API communities have disproportionately high rates of chronic HBV infection and low rates of HBV vaccination. Using de-identified data collected from 650 individuals, we will use biostatistical methods to assess the factors associated with either chronic HBV infection or vaccination status. There is a current gap of knowledge surrounding chronic HBV infection patterns in this geographic area. The results of this study are a necessary step in developing population-based interventions to reduce the significant health disparities associated with HBV among APIs in this region.

### Anticipated Duration of Project

1/1/2011 – 12/31/2011

### Project Overview

Hypothesis 1: HBV infection or protection status will be correlated with age, country of origin, year of entry into the U.S., and English proficiency.

Specific Aim 1: To determine the sociocultural and demographic factors associated with hepatitis B virus (HBV) infection or protection status among high-risk Asian and Pacific Islander (API) communities in Southeastern Pennsylvania (SEPA).

Objective 1A: Using community hepatitis B screening data collected from 650 API individuals living in SEPA, conduct logistic regression analysis with SAS statistical software, using HBV status as the outcome of interest.

Hypothesis 2: Limited health care access will be correlated with age, country of origin, year of entry into the U.S., annual income, understanding of the U.S. health care system, and English proficiency.

Specific Aim 2: To determine the sociocultural and demographic factors associated with limited health care access among infected and non-infected foreign-born (API) individuals living in SEPA.

Objective 2A: Using community hepatitis B screening data collected from 650 API individuals living in SEPA, conduct logistic regression analysis with SAS statistical software, using the number of physician visits and the acquisition of a “medical home” as the outcomes of interest.

### **Principal Investigator**

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### **Other Participating Researchers**

Alison Evans, ScD – employed by Hepatitis B Foundation

### **Expected Research Outcomes and Benefits**

Hepatitis B is one of the most common chronic infections in Pennsylvania, and disproportionately affects Asians and Pacific Islanders, for whom chronic hepatitis B and liver cancer represent the largest health disparity. It is vital that we better understand the patterns of chronic HBV infection in API populations in Pennsylvania, in order to help prevent HBV infection transmission in high risk communities, and to be able to meet the health needs of infected individuals. The information gained from this project will be important in determining which specific communities within SEPA most need targeted educational interventions, so that we can best meet their needs while conserving programmatic resources. Project results will be used for developing future interventions aimed at improving vaccination rates among high-risk API communities, and improving health care access rates among infected individuals. Thus, this project is an important step in reducing morbidity and mortality associated with chronic HBV infection in PA, as well as eliminating the health disparities associated with this serious disease.

### **Summary of Research Completed**

Data Source and Data Preparation: The source of subjects for this study is provided by a pre-existing database compiled by the Hepatitis B Foundation. The database contains the completed survey information and blood sample test results from 12 screening events conducted targeting the high-risk API immigrant population. The database provided for the study originally consisted of 691 participants. After the exclusion of those under 18 years of age (n=2) and those missing blood samples (n=4), the final cross-sectional study sample used for data analysis

included 685 individuals. As this study only targeted API individuals, the data was then subset to those identified as Asian or Pacific Islander, excluding an additional 46 individuals. The final data set used for analysis consisted a total of n=639 subjects.

Variable Definitions: The variables included in the database were measured in one of two ways. They were either self-reported on the HBV Screening Survey or quantified by laboratory from the blood sample provided during screening.

Dependent Variables from Blood Sample

- Hepatitis B infection is a dichotomous variable determined by the presence of hepatitis B surface antigen (HBsAg) in the blood sample
- Hepatitis B immunity is a dichotomous variable determined by the presence of hepatitis B surface antibody (HBsAb) in the blood sample

Demographic Variables from HBV Self-Report Screening Survey

- Age: continuous variable calculated from birthdate provided on survey
  - Age Group (categorical variable): 18-39, 40-49 , 50-59, and 60 or Greater
- Gender (categorical value) : Male or Female
- Education (categorical variables): Less than High School, High School, or Greater than High School
- Country of Birth, Mother's Country of Birth, Dad's Country of Birth, (categorical value): Korea, China, India, Vietnam, or \*Other (Other= Lao, Cambodia, Indonesia, Malaysia Hong Kong)
- Years in the US (categorical): > 28 years, 28-17 years, and < 17 years
- English as primary language, Insurance, Healthcare Provider (dichotomous variable): yes or no

Living Situation and Family History Variables

- Number of People Living With (categorical): < 4 people, 4 or more people
- Living with Individual Infected with HBV, Family Member with Hepatitis B, and Family Member with Cancer (dichotomous) : yes or no

Data Analysis: Descriptive statistics were run on the final dataset. Univariate analysis was performed on both the continuous and categorical variables. The central tendency and dispersion of the continuous variables were determined and transformed into categorical variables grouped by quartiles. The frequency distributions of all categorical variables were identified. The general prevalence of HBV infection and HBV immunity was calculated.

Bivariate analysis was performed to identify any possible associations between the dependent variables (HBV infection and HBV immunity) and the previously described independent socio-cultural and demographic variables. These crude associations were explored using either a chi-square test or Fisher exact test.

Multivariate analysis was performed to simultaneously examine the effects of the independent demographic, socio-cultural, and knowledge of HBV variables on the two dependent outcome variables. The predictive variables of interest were country of origin, years in the United States, and family history of HBV or liver cancer.

All data analysis was performed on SAS Statistical Software Version 9.1.3.

**Results:** The population consisted of self-identified Asians or Pacific Islanders (n=639), both immigrants and US-born, aged 18-85 years (Mean=51.5, SD=14.9) (Table 1). Over half of the participants were female (n=386, 60.5%) while men (n=253) comprised 39.5% of the population. Most of the APIs were foreign-born immigrants from Korea (n=167, 27.2%), China (n=139, 22.6%), India (n=109, 17.8%), and Vietnam (n=71, 11.6%). The remaining 128 participants (20.9%) were born in the United States, Lao, Cambodia, Malaysia, Hong Kong, and Indonesia. Of the immigrants, 54.9% (n=337) had been in the U.S. for less than 17 years. English was not the primary language for 90.9% of participants (n=572). The screened population had an overall HBV infection prevalence of 5.8 % (n=40), and an HBV immunity prevalence of 52.6% (n=360).

**HBV Infection:** The prevalence of HBV varied across all demographic variables, except gender (Table 2). HBV prevalence was highest in the youngest age group of 18-39 years (n=18, 46.2%) and lowest in those aged 60 years or greater (n=5, 12.8%). Chinese immigrants had the highest HBV infection prevalence (n=25, 65.8%), while immigrants from India had the lowest (n=109, 0%). The majority (71%) of those infected with HBV had been in the U.S. for less than 17 years.

HBV infection is summarized by living situation, family history, and HBV knowledge in Table 3. Within the study population, infection was more likely in households with 4 or more people (n=22, 56.4%). Most of those testing positive for HBV infection were not knowingly living with anyone with HBV nor were they aware of any family member with HBV. Additionally, those with HBV infection were more likely to have been previously tested.

**HBV Immunity:** HBV immunity was highest in females (n=205, 59.8%), and in the  $\geq 60$  age group (n=136, 39.5%), but lowest in the 40-49 age group (n=62, 18%) (Table 4). HBV immunity was highest among Korean immigrants (n=135, 41.4%), among immigrants who had been in the U.S. for  $\leq 17$  years (n=150, 46%), and among those for whom English was not their primary language (n=312, 93.4%). No differences were found in HBV immunity by education or gender.

HBV immunity is summarized by living situation, family history, and knowledge of HBV in Table 5. Individuals living in smaller households of less than 4 were more likely to have HBV immunity (n=190, 55.2%). Similar to HBV infection, those with the highest rates of immunity were not living with anyone with HBV and were not aware of family members with HBV or liver cancer.

**Table 1 : Study Population Characteristics**

Characteristics	n (%)
<b>HBV Infection</b>	<b>40 (5.8)</b>
<b>HBV Immunity</b>	<b>360 (52.6)</b>
<b>HBV Vaccination</b>	<b>110 (16.0)</b>
<b>Gender</b>	
Male	252 (39.5)
Female	386 (60.5)
<b>Age (Mean, SD)</b>	<b>51.5,14.9</b>
18-39	144 (22.5)
40-49	125 (19.6)
50-59	158 (24.7)
60 +	212 (33.2)
<b>Years in US (Mean, SD)</b>	<b>(17.2,10.9)</b>
< 17 yrs	337 (54.9)
17-28 yrs	146 (23.8)
> 28 yrs	131 (21.3)
<b>English Primary Language</b>	
Yes	57 (9.1)
No	572 (90.9)
<b>Country of Birth</b>	
Korea	167 (27.2)
China	139 (22.6)
India	109 (11.6)
Vietnam	71 (6.51)
Other	128 (32.1)
<b>Mother's Country of Birth</b>	
Korea	178 (28.2)
China	186 (29.5)
India	110 (17.4)
Vietnam	58 (9.2)
Other	99 (15.7)
<b>Father's Country of Birth</b>	
Korea	178 (28.2)
China	195 (30.9)
India	110 (17.4)
Vietnam	54 (8.6)
Other	94 (14.9)
<b>Education Level</b>	
< High School	168 (30.3)
High School	165 (29.7)
>High School	222 (40)
<b>Insurance</b>	
Yes	317 (50.2)
No	314 (49.8)
<b>Regular Doctor</b>	
Yes	317 (50.2)
No	314 (49.8)

**Table 2 : Demographics by HBV Infection (+/-)**

Characteristics	HBV Infection n (%)	No HBV Infection n (%)	p-value
<b>Gender</b>			0.0585
Male	21 (53.9)	231 (38.6)	
Female	18 (46.1)	368 (61.4)	
Total (%)	39 (100)	599 (100)	
<b>Age (Mean, SD)</b>			0.0012
18-39	18 (46.2)	126 (21.0)	
40-49	6 (15.4)	119 (19.8)	
50-59	10 (25.6)	148 (24.7)	
60 +	5 (12.8)	207 (34.5)	
Total (%)	39 (100)	600 (100)	
<b>Years in US (Mean, SD)</b>			0.0016
≤ 17 yrs	27 (71.0)	310 (53.8)	
18-28 yrs	8 (21.1)	138 (24.0)	
> 28 yrs	3 (7.9)	128 (22.2)	
Total (%)	38 (100)	576 (100)	
<b>English Primary Language</b>			0.0218
Yes	0 (0)	57 (9.7)	
No	39 (100)	533 (90.3)	
Total (%)	39 (100)	590 (100)	
<b>Country of Birth</b>			<.0001
Korea	2 (5.3)	165 (28.7)	
China	25 (65.8)	114 (19.8)	
India	0 (0)	109 (18.9)	
Vietnam	4 (10.5)	67 (11.6)	
Other	7 (18.4)	121(21.0)	
Total (%)	38 (100)	576 (100)	
<b>Mother's Country of Birth</b>			<.0001
Korea	2 (5.3)	176 (29.7)	
China	26 (68.4)	160 (26.9)	
India	0 (0)	110 (18.6)	
Vietnam	4 (10.5)	54 (9.1)	
Other	6 (15.8)	93 (15.7)	
Total (%)	38 (100)	593 (100)	
<b>Father's Country of Birth</b>			<.0001
Korea	2(5.3)	176 (29.7)	
China	29 (76.3)	166 (27.9)	
India	0 (0)	110 (18.6)	
Vietnam	2 (5.3)	52 (8.8)	
Other	5 (13.1)	89 (15.0)	
Total (%)	38 (100)	593 (100)	
<b>Education Level</b>			0.0002
< High School	21 (58.3)	147 (28.3)	
High School	10 (27.8)	155 (29.9)	
>High School	5 (13.9)	217 (41.8)	
Total (%)	36 (100)	519 (100)	
<b>Insurance</b>			0.0003
Yes	8 (21.6)	309 (52.0)	
No	29 (78.4)	285 (48.0)	
Total (%)	37 (100)	594 (100)	
<b>Regular Doctor</b>			0.0023
Yes	10 (26.3)	307 (51.8)	
No	28 (73.7)	286 (49.2)	
Total (%)	38 (100)	593 (100)	

**Table 3 : Living Situation, Family History, and HBV Knowledge by Infection**

<b>Characteristics</b>	<b>HBV Infection n (%)</b>	<b>No HBV Infection n (%)</b>	<b>p-value</b>
<b>How Many People Do You Live With?*</b>			0.1606
< 4	15 (38.5)	311 (51.8)	
≥ 4	22 (56.4)	245 (91.7)	
No Response	2 (5.1)	44 (7.3)	
Total (%)	39 (100)	600 (100)	
<b>Living With Anyone with HBV?</b>			0.0074
Yes	7 (17.9)	33 (5.5)	
No	29 (74.4)	500 (83.3)	
No Response	3 (7.7)	67 (11.2)	
Total (%)	39 (100)	600 (100)	
<b>Family Members With HBV?</b>			0.011
Yes	7 (18.0)	53 (8.8)	
No	19 (48.7)	427 (71.2)	
No Response	13 (33.3)	120 (20.0)	
Total (%)	39 (100)	600 (100)	
<b>Family Members with Liver Cancer?</b>			0.7019
Yes	2 (5.1)	19 (3.2)	
No	13 (33.3)	204 (34.0)	
No Response	24 (61.5)	377 (62.8)	
Total (%)	39 (100)	600 (100)	
<b>Reason for Screening</b>			0.5827
Saw an Ad	5 (12.8)	82 (13.7)	
Recruited at Location	5 (12.8)	102 (17.0)	
Received Letter	3 (7.7)	27 (4.5)	
Other	1 (2.6)	48 (8.0)	
No Response	25 (64.1)	341 (56.8)	
Total (%)	39 (100)	600 (100)	
<b>Previously Tested for HBV?</b>			< .0001
Yes	20 (51.3)	114 (19.0)	
No	14 (35.9)	372 (62.0)	
No Response	5 (12.8)	114 (19.0)	
Total (%)	39 (100)	600 (100)	
<b>If Yes, Results?</b>			< .0001
Yes	10 (25.6)	14 (2.3)	
No	1 (2.6)	40 (6.7)	
No Response	28 (71.8)	546 (91.0)	
Total (%)	39 (100)	600 (100)	
<b>Prior HBV Treatment?</b>			0.0052
Yes	3 (7.7)	5 (0.8)	
No	27 (69.2)	378 (63.0)	
No Response	9 (23.1)	217 (36.2)	
Total (%)	39 (100)	600 (100)	

<b>Table 4 : Demographics by Immunity (+/-)</b>			
<b>Characteristics</b>	<b>HBV Immunity n (%)</b>	<b>No HBV Immunity n (%)</b>	<b>p-value</b>
<b>Gender</b> 0.6822			
Male	138 (40.2)	114 (38.6)	
Female	205 (59.8)	181 (61.4)	
Total (%)	343 (100)	295 (100)	
<b>Age (Mean, SD)</b> 0.003			
18-39	72 (20.9)	72 (24.4)	
40-49	62 (18.0)	63 (21.4)	
50-59	74 (21.5)	84 (28.5)	
60 +	136 (39.5)	76 (25.8)	
Total (%)	344 (100)	295 (100)	
<b>Years in US (Mean, SD)</b> < .0001			
≤ 17 yrs	150 (46.0)	187 (64.9)	
18-28 yrs	89 (27.3)	57 (19.8)	
> 28 yrs	87 (26.7)	44 (15.3)	
Total (%)	326 (100)	288 (100)	
<b>English Primary Language</b> 0.0214			
Yes	22 (6.6)	35 (11.9)	
No	312 (93.4)	260 (88.1)	
Total (%)	334 (100)	295 (100)	
<b>Country of Birth</b> < .0001			
Korea	135 (41.4)	32 (11.1)	
China	79 (24.2)	60 (20.8)	
India	4 (1.2)	105 (36.5)	
Vietnam	48 (14.7)	23 (8.0)	
Other	60 (18.4)	68 (23.6)	
Total (%)	326 (100)	288 (100)	
<b>Mother's Country of Birth</b> < .0001			
Korea	145 (42.8)	33 (11.3)	
China	111 (32.7)	75 (25.7)	
India	4 (1.2)	106 (36.3)	
Vietnam	37 (10.9)	21 (7.2)	
Other	42 (12.4)	57 (19.5)	
Total (%)	339 (100)	292 (100)	
<b>Father's Country of Birth</b> < .0001			
Korea	145 (42.8)	33 (11.3)	
China	110 (32.5)	85 (29.1)	
India	4 (1.2)	106 (36.3)	
Vietnam	37 (10.9)	17 (5.8)	
Other	43 (12.7)	51 (17.5)	
Total (%)	339 (100)	292 (100)	
<b>Education Level</b> 0.9182			
< High School	80 (30.4)	88 (30.1)	
High School	80 (30.4)	85 (29.1)	
> High School	103 (39.2)	119 (40.8)	
Total (%)	263 (100)	292 (100)	
<b>Insurance</b> 0.0004			
Yes	192 (56.8)	125 (42.7)	
No	146 (43.2)	168 (57.3)	
Total (%)	338 (100)	293 (100)	
<b>Regular Doctor</b> 0.0153			
Yes	185 (54.7)	132 (45.1)	
No	153 (45.3)	161 (54.9)	
Total (%)	338 (100)	293 (100)	

**Table 5 : Living Situation, Family History, and HBV Knowledge by Immunity**

<b>Characteristics</b>	<b>HBV Immunity n (%)</b>	<b>No HBV Immunity n (%)</b>	<b>p-value</b>
<b>How Many People Do You Live With?*</b>			<b>&lt;.0001</b>
< 4	190 (55.2)	136 (46.1)	
≥ 4	117 (34.0)	150 (50.9)	
No Response	37 (10.8)	9 (3.0)	
Total (%)	344 (100)	295 (100)	
<b>Living With Anyone with HBV?</b>			<b>0.0003</b>
Yes	26 (7.6)	14 (35.0)	
No	266 (77.3)	263 (49.7)	
No Response	52 (15.1)	18 (25.7)	
Total (%)	344 (100)	295 (100)	
<b>Family Members With HBV?</b>			<b>0.0578</b>
Yes	41 (11.9)	19 (6.4)	
No	235 (68.3)	211 (71.5)	
No Response	68 (19.8)	65 (22.0)	
Total (%)	344 (100)	295 (100)	
<b>Family Members with Liver Cancer?</b>			<b>&lt; .0001</b>
Yes	13 (3.8)	8 (2.7)	
No	74 (21.5)	143 (48.5)	
No Response	257 (74.7)	144 (48.8)	
Total (%)	344 (100)	295 (100)	
<b>Reason for Screening</b>			<b>0.6137</b>
Saw an Ad	39 (14.2)	38 (12.9)	
Recruited at Location	64 (18.6)	43 (14.6)	
Received Letter	15 (4.4)	15 (5.0)	
Other	27 (7.9)	22 (7.5)	
No Response	189 (54.9)	177 (60.0)	
Total (%)	344 (100)	295 (100)	
<b>Previously Tested for HBV?</b>			<b>0.0008</b>
Yes	89 (25.9)	45 (15.3)	
No	186 (54.1)	200 (67.8)	
No Response	69 (20.0)	50 (16.9)	
Total (%)	344 (100)	295 (100)	
<b>If Yes, Results?</b>			<b>0.0151</b>
Yes	13 (3.8)	11 (3.7)	
No	31 (9.0)	10 (3.4)	
No Response	300 (87.2)	274 (92.9)	
Total (%)	344 (100)	295 (100)	
<b>Prior HBV Treatment?</b>			<b>0.5261</b>
Yes	3 (0.9)	5 (1.7)	
No	215 (62.5)	190 (64.4)	
No Response	126 (36.6)	100 (33.9)	
Total (%)	344 (100)	295 (100)	