Eliminating Chronic Hepatitis B Disparities among Asian Pacific Islanders:

A Model for Transforming Public Health in the Pacific

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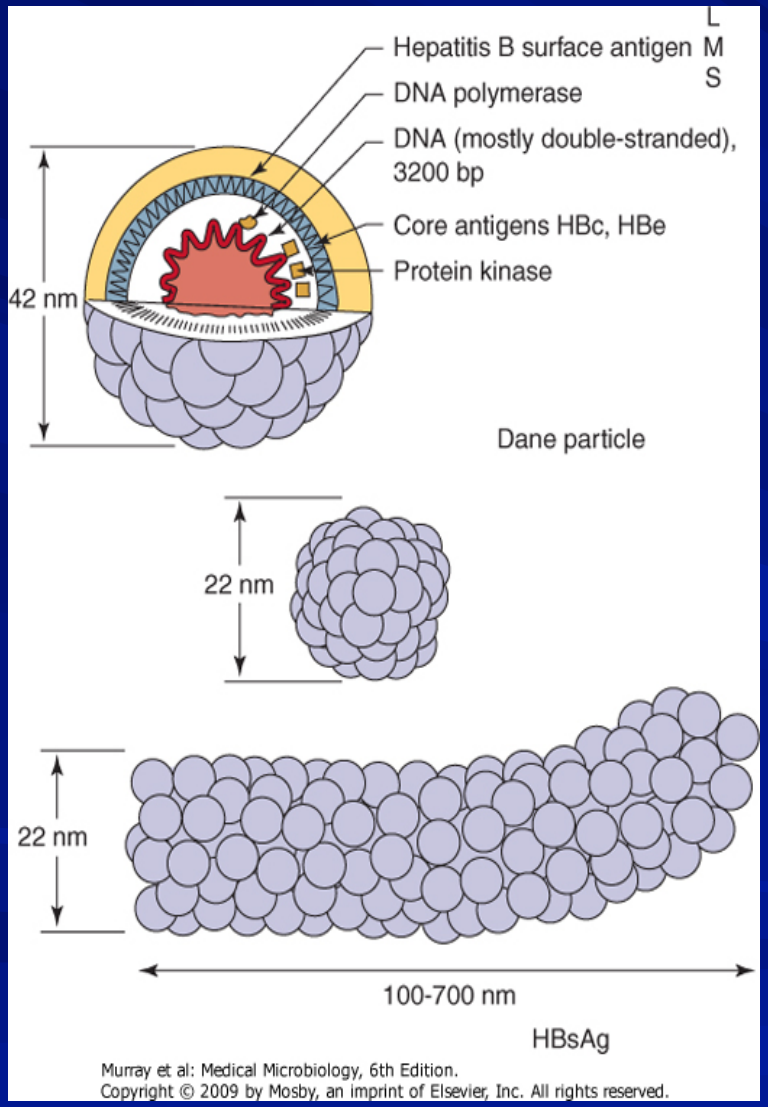
Introduction

- Increasing Chronic Hep B virus (HBV) carriers in the U.S. is due to immigration from endemic regions
- 2 million chronic HBV in US: 50-70% are immigrants
- Hawaii has large Asian Pac Isld (API) population → immigrants from endemic areas: China, PI, Vietnam, & Pacific Islands.
- CDC recommend screening foreign born immigrants (2008)
- Community based public health program is conducted in effort to reduce health disparity of HBV in API
  - Public and private stake holders
  - Free HBV screening and vaccination
  - Hawaii *3-ForLife* is created:
    - Model for healthy community, and
    - Transforming public health in Pacific

Hepatitis B Virus



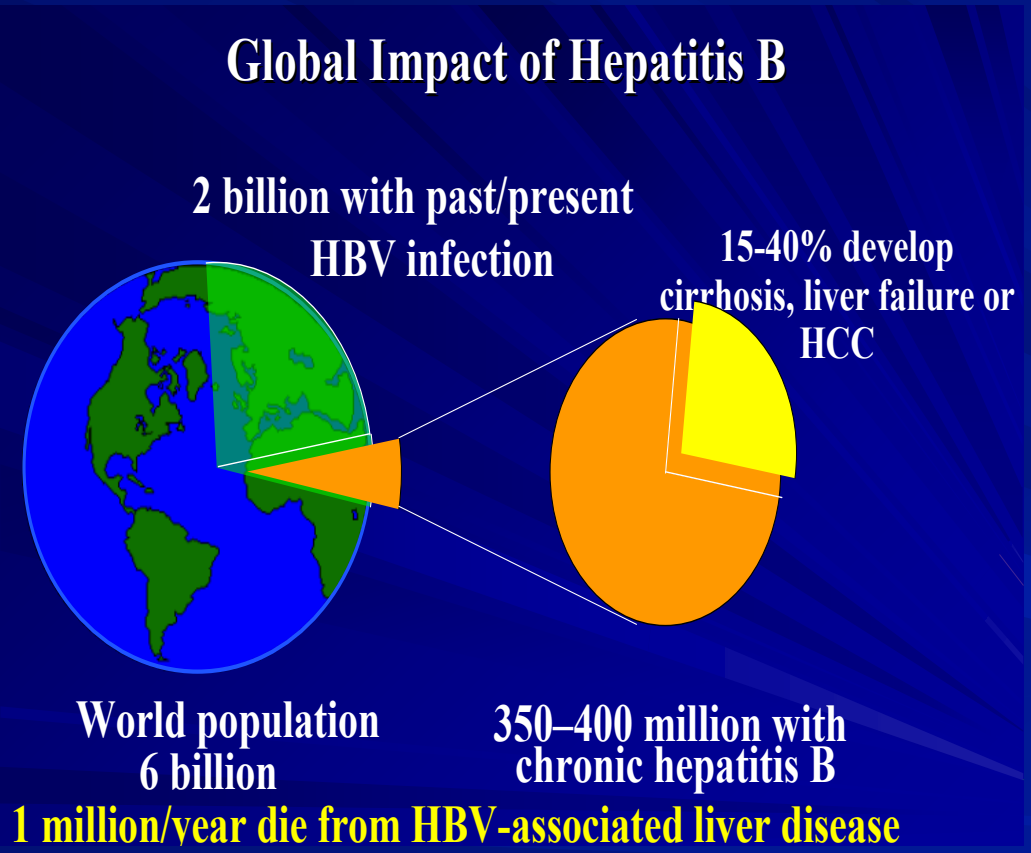
- Hepadnaviridae family – Primarily infect liver cells
- Human are the only known host
- Double strain circular DNA vi
- 100 x more infective than HIV
- Retain infectivity ≥ 7 days (room T)
- Numerous antigenic components
  - surface antigen: HBsAg
  - core antigens: HBcAg, HBeAg
  - DNA polymerase
- Clinically may cause
  - Acute hepatitis
  - Chronic hepatitis
  - Chronic carrier state
  - Hepatocellular carcinoma (HCC)

Epidemiology of HBV Infection

- HBV infection is a global public health problem
  - High Morbidity and Mortality
  - Asia & Western Pacific are highly endemic countries

- In US: High prevalence of HBV infection in API
  - Immigration pattern affects prevalence

Disease Burden of Chronic HBV Infection



(Source: AASLD 2008 conference presentation, with references: WHO Fact Sheets; Conjeevaram, et al. (2003), JHepatology, 38:S90-S103; Lee (1997), N Engl J Med., 337, 1733-1745; Lok (2002), N Engl J Med., 346, 1682-1683)

World Wide

- 2 out of 6 billion world pop. have been infected with HBV
- 350-400 million Chronic carriers WW → 15-40% develop cirrhosis, HCC, or end stage liver failure
- HBV is Human carcinogen 80% of HCC caused by HBV
- Chronic HBV cause 1 .2 million death each year → 10th leading cause of death

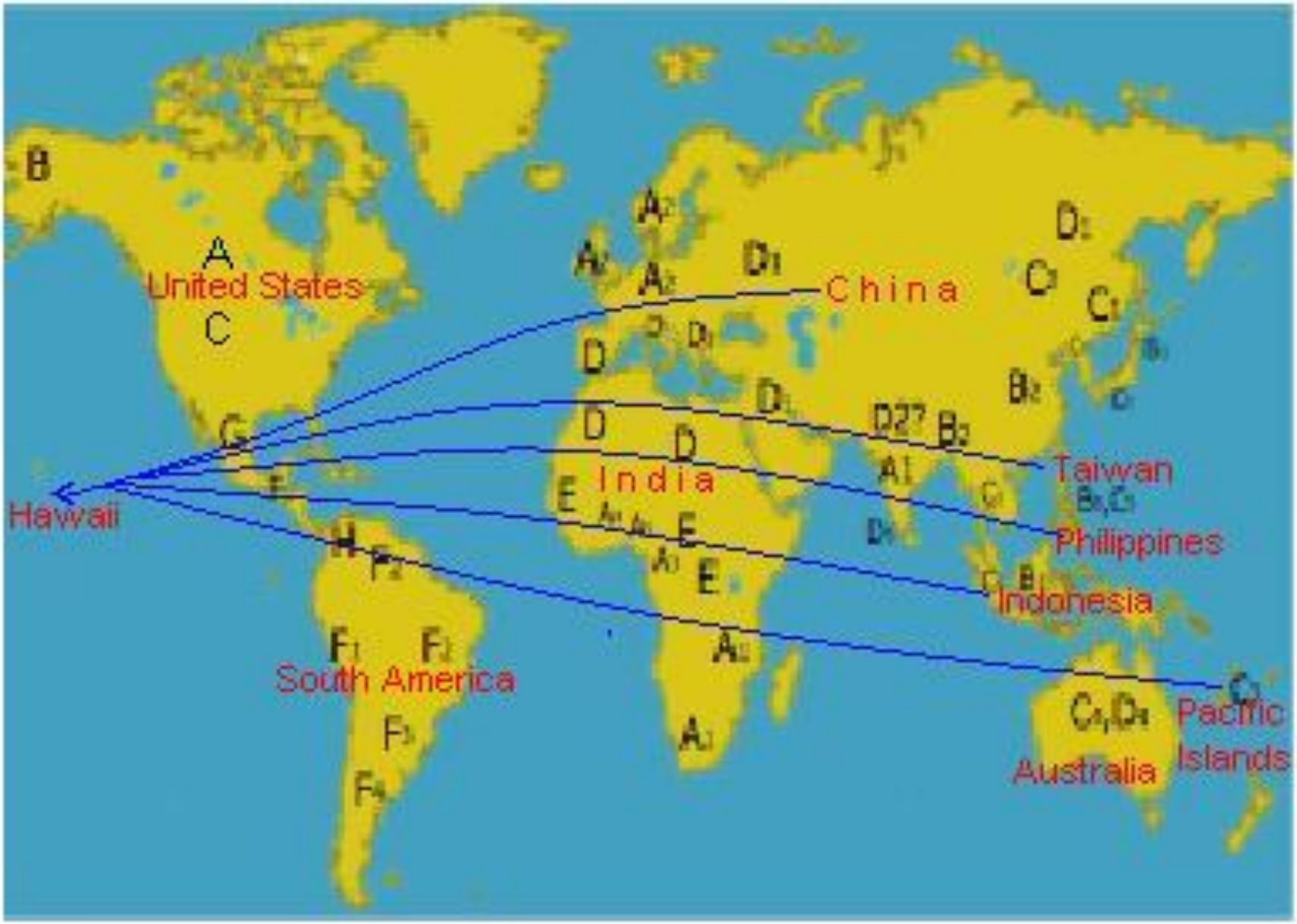
United States

- 1.25 million carriers
- 2 million carrier if counted w/ immigrants→ endemic areas immigrants, including API, impact the US pattern of dis.

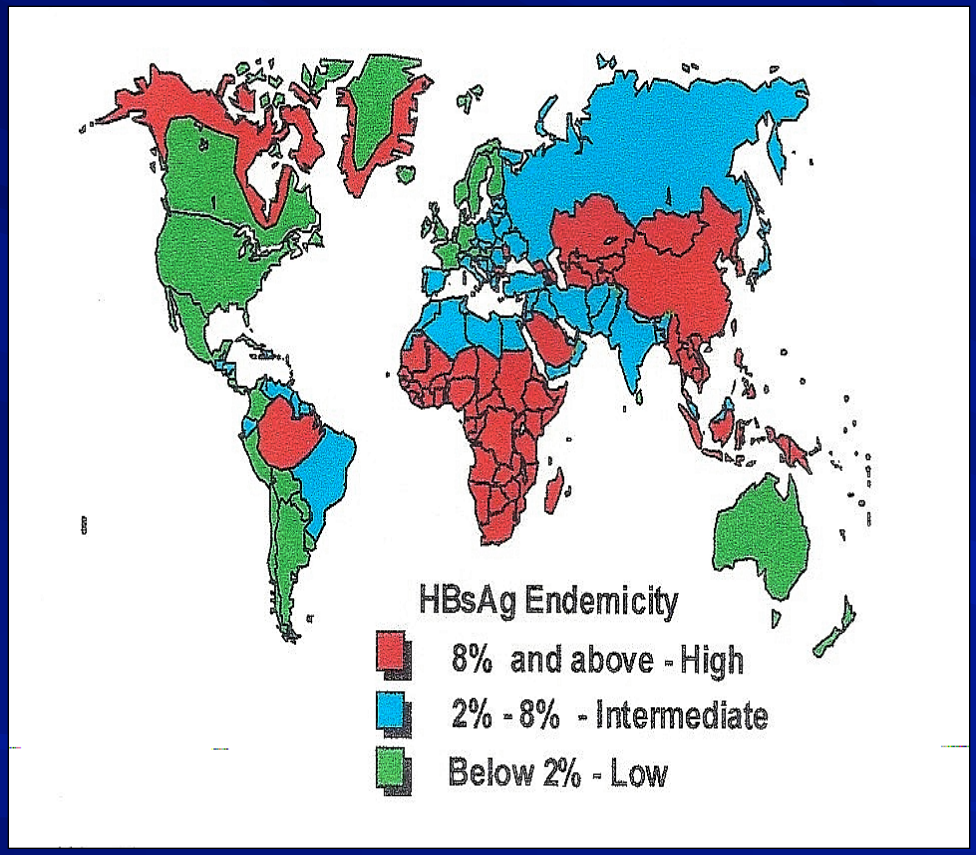
Global Burden of Chronic HBV carriers

- 350 millions people infected WW
- 250 millions are in Asia Pacific
- South Pacific→ highest carrier (prevalence in Kiribati = 31%)
- Developed countries→ HBsAg prevalence is high among immigrants from high endemicity regions

(Source: WHO, 2000; Goldstein et al., 2005)


United States
China
Taiwan
Philippines
Indonesia
Pacific Islands
Australia
India
South America
Hawaii

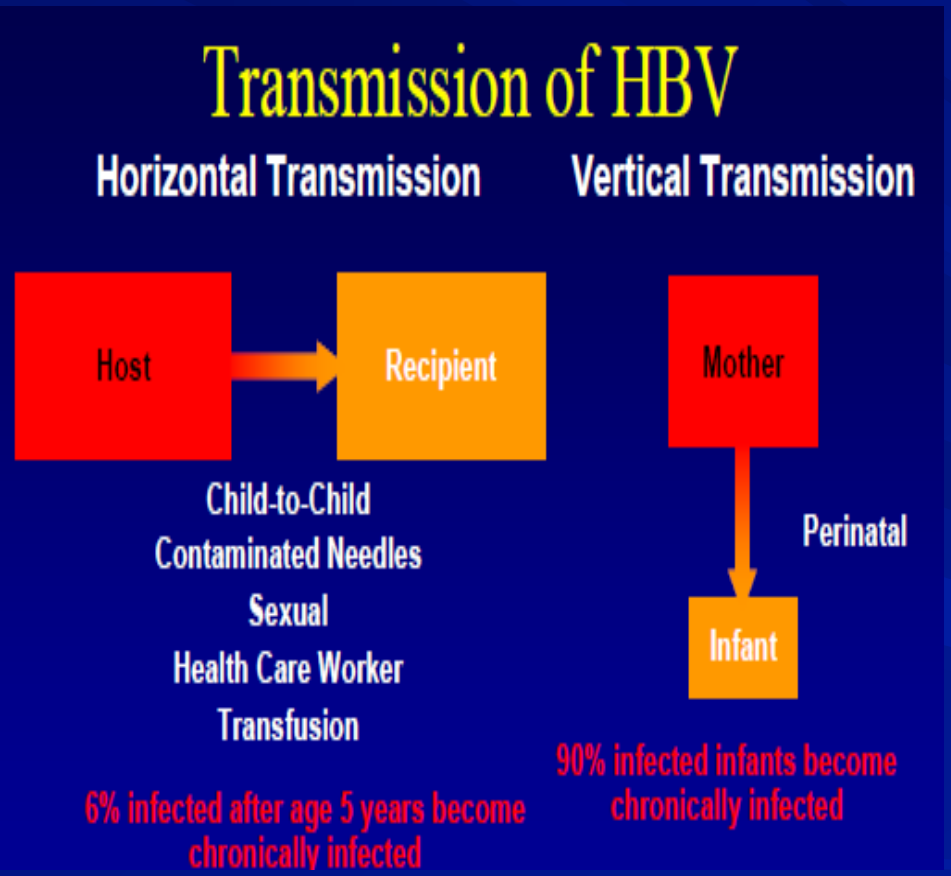
Geographic Distribution of HBV Infection



(Source: World Health Organization: Hepatitis B surface antigen assays:
Operational characteristics (Phase 1) Report 2, 2004)

- **High >8%:**
  - 45% of global population
  - SE Asia, Pacific, Amazon basin, Subsahara Africa
  - Early childhood infection
  - lifetime risk infection > 60%
- **Intermediate: 2-8%:**
  - 43% global population
  - infection in all agegroup
  - lifetime risk infection 20%-60%
- **Low <2%**
  - 12% of global population
  - North America, Europe, Austral
  - Adult risk group infection
  - lifetime risk infection <20%

Transmission of HBV Infection



- **Concentration of HBV**
  High: blood & wound exudate
  Moderate: semen, vaginal fluid, and saliva
  low: urine, feces, breast milk

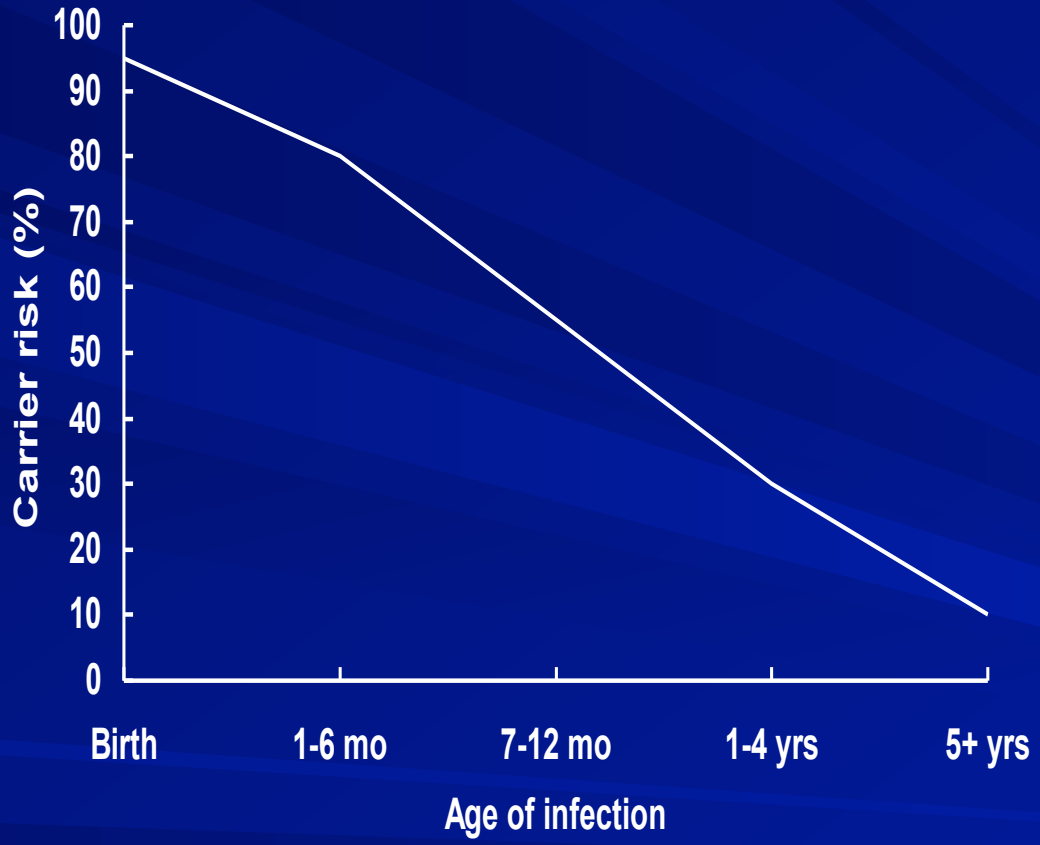
- **HBV transmitted by:**

1. Horizontal Transmission
- Contaminated needle/equipmt.
- Transfusion
- Sexual
- Direct contact with body fluid
- Child to child (intra-familial)

2. Vertical Transmission
- Perinatal→ during child birth

Source: AASLD 2008 conference presentation, with references:
CDC Fact Sheet: http://www.cdc.gov/ncidod/diseases/hepatitis/b;
Lee (1997); Lavanchy (2004)

Risk of Chronic HBV Carriage by Age of Infection



- The risk of becoming chronic HBV carrier decreased with increased age of acquisition
- 90% infected infants become chronically infected (if not vaccination)
- 25%-30% infected in early childhood (<5 years)
- 6%-10% infected 5 years to adults

(Source: CDC; Goldstein et al., 2005; McMahon et al., 1985)

Management of HBV Infection

Prevention

- Prevent perinatal transmission → routine vaccination of all infants
- Vaccinate all children and adolescents
- Vaccinate all adults in high risk groups

Treatment

- Treatment not curing, but modify complication
- Reduce impact of adverse outcome
- Reduce risk of Hepatocellular Carcinoma
- Reduce cost of care in chronic carriers

Hepatitis B Problem in Hawaii

- Hawaii population (1.27 mil): API is largest ethnic group
  71% of HI pop. live in Honolulu: 46% Asian, 10% PI
- Many of API in HI are FB from endemic countries
- High rate of immigration from Asia & PI to HI
- Highest incidence and mortality rate of HBV assoc. liver disease impacted by migration from API
- No HBV screening and vaccination for immigrants d/t budget cut and closing of available clinic (LIVE Clinic – Lanakila Immigrants Vaccination & Evaluation)

<u>Solution of the problem:</u>

- Hepatitis B community based public health intervention for Screening and vaccination→ Hawaii 3ForLife program
- HI-3FL fill a gap for HBV study in HI adult population
- Implement CDC recommendation for screening and vaccination

CDC Recommendations for Routine Testing and Follow-up for Chronic Hepatitis B Virus Infection

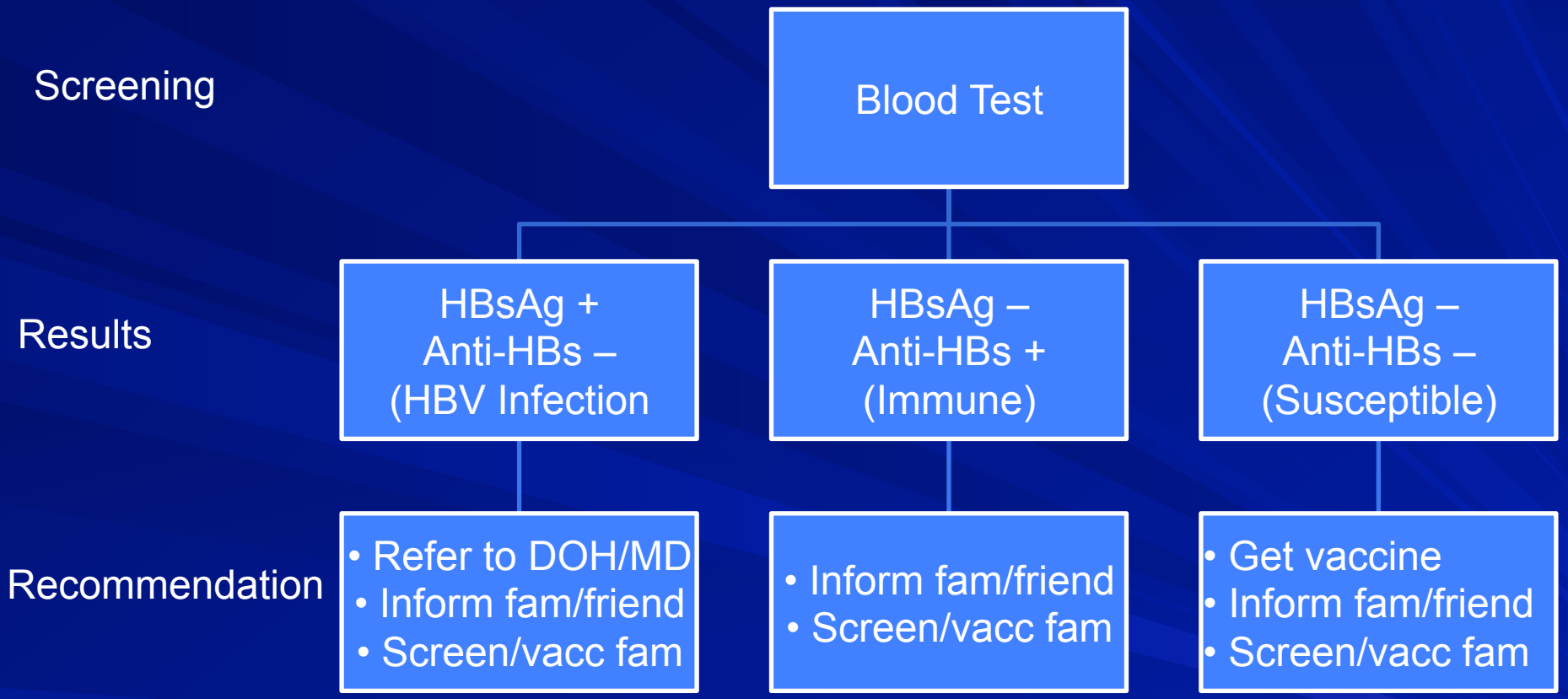
Population	Recommendation	
	Testing	**Vaccination/Follow up**
Person born in regions of high and intermediate HBV endemicity (HBsAg prev ≥ 2%)	Test for HBsAg, regardless of vaccination status in their country of origin, including – immigrants – refugees – asylum seekers – internationally adopted children	If HBsAg-positive, refer for medical management. If negative, assess for on-going risk for hepatitis B and vaccinate if indicated.
US born persons not vaccinated as infants whose parents were born in regions with high HBV endemicity (8%)	Test for HBsAg regardless of maternal HBsAg status if not vaccinated as infants in the United States.	If HBsAg-positive, refer for medical management. If negative, assess for on-going risk for hepatitis B and vaccinate if indicated

Adapted from: CDC. Recommendations for Identification and Public Health Management of Persons with Chronic HBV Infection. MMWR 2008; 57 (No. RR-8).

Hawaii 3ForLife Program

- Community mobilization for hepatitis B awareness, prevention, and intervention in Honolulu
- Provided free hepatitis B screening and vaccination for Hawaii adult population, particularly for API community
- Program partners include:
  - Hawaii Jade Ribbon Campaign
  - Asian Liver Center – Standford University
  - Hawaii Department of Health
  - Kalihi Palama Community Health Center (KPHC)
  - Gilead Pharmaceutical
  - Clinical Lab of Hawaii and Diagnostic Lab
  - Community volunteers
- 1 year Pilot program from Sept 2006 to Sept 2007
- Screening conducted at various health fairs & cultural organization events
- Vaccination conducted at KPHC
- Vaccine provided by HI-DOH

Screening/Vacc Procedure at HI-3FL:



Purpose of the study

- Analysis of dataset from HI 3FL program
  - Describe point prevalence of HBV infection
  - Describe point prevalence of HBV susceptibility
  - Describe point prevalence of HBV immunity

- Compare the prevalence rates according to
  - Race/ethnicity
  - Country of birth (Foreign Born/U.S. Born)

- Evaluate compliance among susceptible participants in obtaining hepatitis B vaccine

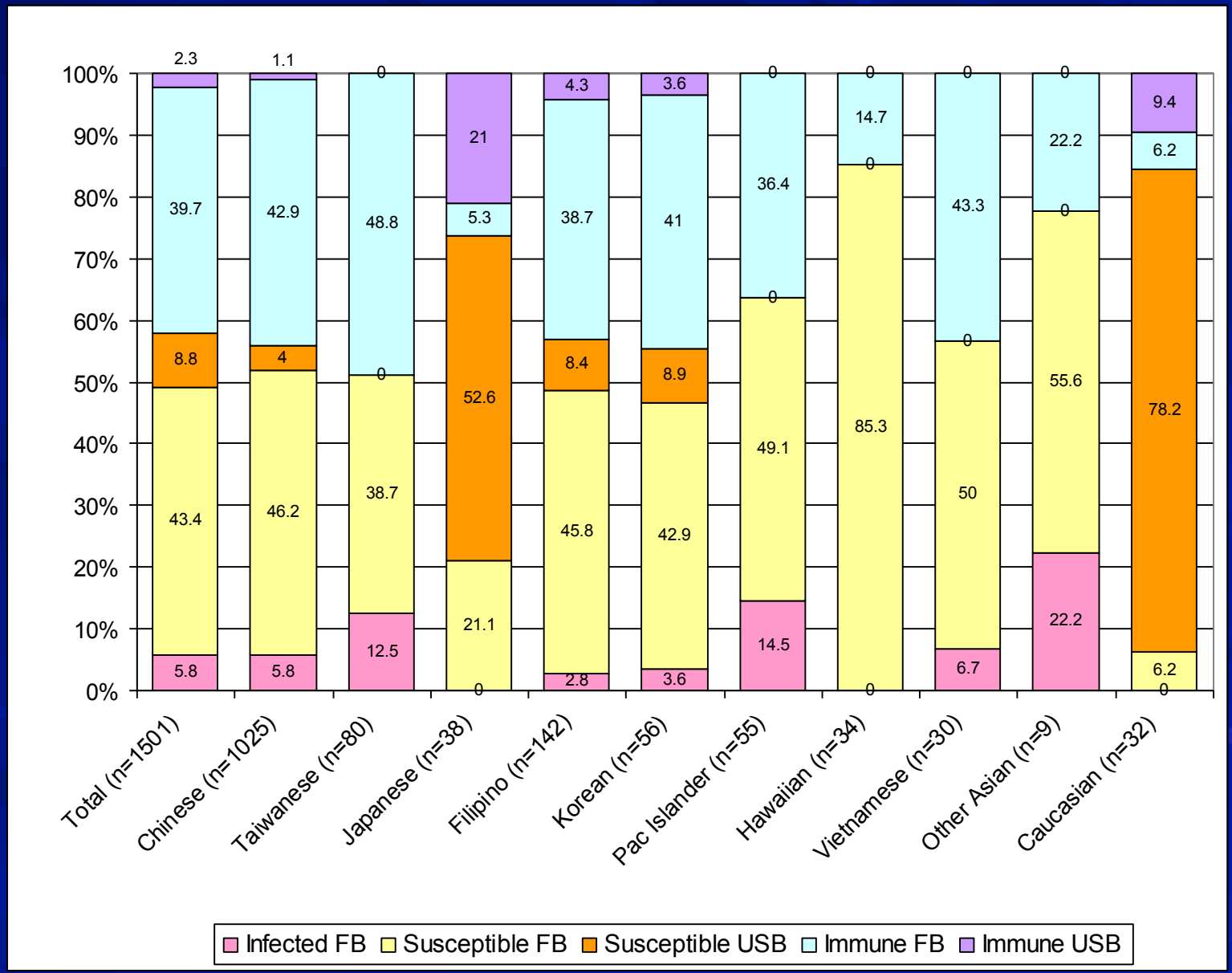
Demographic characteristics of the screening samples (N=1511)

- Age ranged from 18 to 102 years (median=54 years)
- 62.8% female
- 18 ethnicities represented
  - Chinese (73.5%)
  - Filipino (9.4%)
  - Korean (3.7%)
  - Pac Isl (3.6)
  - Japanese (2.5%)
  - Hawaiian (2.3%)
  - Caucasian (2.1)
  - Other Asian (0.6)
- 89% Foreign born (Represented 26 foreign countries)
  - 96% Asian
  - 4% Pac Islander

Prevalence of HBV

- Total prevalence of HBV infection: 5.8%
  - By ethnicity, ranged from 2.8% (Filipino) to 14.5% (Pacific Islander)
- Total prevalence of HBV susceptibility: 52.2%
  - By ethnicity, ranged from 38.7% (Taiwanese) to 85.3% (Hawaiian)
- Total prevalence of HBV immunity: 42%
  - By ethnicity, ranged from 14.7% (Hawaiian) to 48.8% (Taiwanese)

Prevalence of HBV serologic status among ethnic subgroups of the HI 3FL participants (*N* = 1501)



Prevalence of HBV by Birth Status

- Prevalence of HBV infection
  - FB: 6.5% (87)
  - USB: 0% (0)

- Prevalence of HBV susceptibility
  - FB: 48.8% (651)
  - USB: 79% (132)

- Prevalence of HBV immunity
  - FB: 44.7% (596)
  - USB: 21% (35)

Hepatitis B vaccination compliance (*N*=783)

- Overall: 40% completed 3 dose series

- Compliance rate by birth status
  - FB: 36% (*N*=282)
  - USB: 4.1% (*N*=32)

- Compliance rate by ethnicity
  - Highest (34%, *N*=266): Chinese
  - Lowest (.1%, *N*=1): Pacific Islander

- Compliance rate by age group
  - Highest (20%, *N*=152): 50 – 69 years
  - Lowest (1.4%, *N*=11): 18 – 29 years

- Compliance rate by gender
  - Females (25%, N=199)
  - Males (15%, N=115)

Inferential Analyses

***H01*: In each racial and ethnic subgroup, there is no difference in the prevalence rate of HBV infection among participants who are FB or USB**

- FB more likely to be infected ($\chi 2$ (1) = 11.7, $p < .001$).
- All HBV infection are FB, no comparison test for each ethnicity
- *H*01 rejected

***H02*: In each racial and ethnic subgroup, there is no difference in the prevalence rate of HBV susceptibility among participants who are FB or USB**

- FB more susceptible than USB ($\chi 2$ (1) = 57.59, $p < .001$).
- Chinese: FB more susceptible than USB
- Caucasian: USB more susceptible than FB*
- *H02* rejected

***Ho* 3: In each racial and ethnic subgroup of susceptible participants, there is no difference in the compliance for obtaining complete three dose series of hepatitis B vaccine among participants who are FB or USB**

- FB more compliant than USB ($\chi 2$ (1) = 18.04, $p<.001$).
- Caucasian: FB more compliance than USB*
- *H03* rejected

(* Note: small number of FB Caucasians might affect this result. Susceptible FB/USB: 25/3)

Summary of findings

- HBV infection prevalence: 5.8%
  - General USB population: 0.4%
  - FB API in other states: 4.3% - 16%
  - Highest prevalence in Pacific Islander (14.5%): mirrored home countries

- HBV susceptibility prevalence: 52.2%
  - High susceptibility for both FB (50%) and USB (80%)
  - Low coverage of Hepatitis B vaccination in adults
  - Adult vaccination not supported by federal program

- Hepatitis B vaccination compliance: 40%
  - Non-compliance recognized for certain ethnic (Pac Isld)
  - Perceive lack of awareness and knowledge
  - Healthcare seeking behavior of migrants

Model for Social Change

- Impact on Society
  - Hepatitis B factual knowledge is important for Hawaii population
  - API population and immigrants from endemic countries
  - Increase awareness → positive behavior change for screening & vaccination

- Public Health Program Development
  - Community involvement for PH intervention program
  - Implement CDC recommendation for screening & vaccination
  - Culturally sensitive program that served different ethnic populations

- Greatest importance of social change
  - support effort to reduce health disparity among API-Americans

Recommendations

- Recommendations for action
  - Promote increased awareness for hepatitis B in at-risk populations and health providers
  - Collaborating of key stakeholders with state and federal agencies for PH intervention program for hepatitis B screening and vaccination
  - Finding resource to fund the continuation of the program

- Recommendations for future study
  - Expand screening and vaccination program to increase coverage in ethnic subgroups with low numbers of participants
  - Expand screening and vaccination program to include other islands in Hawaii

Conclusion

- A health disparity exists in hepatitis B for API in Hawaii
- Screening to identify HBV infected individual is crucial for disease management
- Hepatitis B is preventable with vaccination
- Increasing vaccination coverage will decrease the incidence and reducing the disease burden caused by HBV
- Federal and state supports are needed for continuation of :
  - screening and vaccination program
  - referral for medical management
  - improve surveillance
- HI-*3ForLife* program has been effective public health intervention for:
  - Hepatitis B screening of 1511 participants
  - Referral of 87 hepatitis B positive individual to HI-DOH and physicians
  - Provided complete hepatitis B vaccination series to 314 participants

Thank You