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Phillip So Date

Combating HBV in Local Communities: A Brief Background and Project Report

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Combating HBV in Local Communities: A Brief Background and Project Report

By

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Bachelor of Arts
Stanford University
2009

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An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
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2011

Abstract

Combating HBV in Local Communities: A Brief Background and Project Report
By Phillip So

Hepatitis B Virus (HBV) is a pressing public health problem resulting in a significant amount of preventable, premature mortality in the United States and abroad. Education, screening and vaccination strategies have been shown to be effective at the community level in combating HBV. This project report details the genesis, activities, and public health implications of two concurrent projects initiated to address HBV in two communities in the Southeastern United States. The goals of the report are as follows: 1. To use two specific projects as case studies to explore the feasibility and potential of developing community-based health campaigns in the context of the university and local community 2. To reflect on the difficulties and successes in order to extrapolate lessons learned to the broader context. 3. To provide meaningful suggestions such that future projects can be more successful. It is hoped that the report will serve as a guide and a source of inspiration for future health campaigns inside and outside the context of HBV. The case studies yielded the following key findings: Awareness-building and use of community resources can produce effective and sustainable interventions. Undergraduate student groups can be mobilized to lead effective health education campaigns but require galvanizing forces and consistent communication. Community campaigns require responsive partners, interested stakeholders, and collaborative efforts to make any significant progress. Undergraduate students groups may represent a source of enthusiasm and manpower for community projects. Lessons learned from these projects can be exported to other universities and their surrounding communities.

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Executive Summary:

Hepatitis B Virus (HBV) is a pressing public health problem resulting in a significant amount of preventable, premature mortality in the United States and abroad. Education, screening and vaccination strategies have been shown to be effective at the community level in combating HBV. This project report details the genesis, activities, and public health implications of two concurrent projects initiated to address HBV in two communities in the Southeastern United States. The goals of the report are as follows: 1. To use two specific projects as case studies to explore the feasibility and potential of developing community-based health campaigns in the context of the university and local community 2. To reflect on the difficulties and successes in order to extrapolate lessons learned to the broader context. 3. To provide meaningful suggestions such that future projects can be more successful. It is hoped that the report will serve as a guide and a source of inspiration for future health campaigns inside and outside the context of HBV. The case studies yielded the following key findings: Awareness-building and use of community resources can produce effective and sustainable interventions. Undergraduate student groups can be mobilized to lead effective health education campaigns but require galvanizing forces and consistent communication. Community campaigns require responsive partners, interested stakeholders, and collaborative efforts to make any significant progress. Undergraduate students groups may represent a source of enthusiasm and manpower for community projects. Lessons learned from these projects can be exported to other universities and their surrounding communities.

Background Regarding Hepatitis B: Burdens, Interventions, and Strategies for Prevention and Treatment

Introduction:

Chronic infection with the hepatitis B virus (HBV) has been widely recognized as a major public health problem, affecting 350 million people – more than ten times as many people as human immunodeficiency virus/ acquired immunodeficiency syndrome (HIV/ AIDS). The disease is responsible for 60-80% of liver cancer worldwide [1]. Although there is no cure, the existence of effective vaccines and promising early treatment methods makes hepatitis B an especially appropriate target for public health interventions and preventative efforts. Education and vaccination projects in China, Taiwan and the United States have been shown to be effective in raising awareness, knowledge of infection status and immunization coverage [2]. Although it will take longer to assess the impact of HBV health campaigns on morbidity and mortality due to long incubation periods, the association between chronic infection and liver disease is already well established. Screening efforts are especially important to protect and provide care to those born before infant vaccination campaigns and those unaware of their infection status.

Hepatitis B

Hepatitis B is an infectious disease caused by the hepatitis B virus that can lead to liver disease and cancer. There are two forms of infection: acute and chronic. Acute infection usually results in mild disease within six months of exposure. Symptoms can include yellowing of the skin and eyes (jaundice), dark urine, extreme fatigue, nausea, vomiting and abdominal pain. Infected individuals can take several months to a year to

recover [3]. In 2007, less than 5,000 cases of acute infection in the United States (US) were reported to the Centers for Disease Control and Prevention. The fatality rate reported for acute hepatitis B infections is less than 1% [3]. Acute infection can become chronic infection although this does not occur in all cases.

Chronic infection is significantly more dangerous than acute infection. Without proper treatment, one in four chronic carriers will die from HBV-related causes. Chronic HBV infection is particularly deadly because it is a "silent killer." Since the disease can be entirely symptomless, many carriers are unaware of their infection until symptoms of advanced liver cancer appear. By then, treatment options are limited and patient prognoses are poor. According to the American Cancer Society, advanced liver cancer has a 5-year survival rate of less than 5% [4]. Currently, there is no cure for chronic hepatitis B. However early detection, treatment and monitoring can allow many carriers to live healthy and productive lives. HBV is transmitted by exposure to infected blood or other bodily fluids. Vertical infection of infants through perinatal transmission is one of the most common routes of infection is more likely to cause chronic infection than other routes of transmission. Other risky behaviors that can result in infection include unprotected sexual contact and injection drug use. Since chronic infection is a major risk factor associated with liver disease and liver cancer, prevention of HBV transmission has the potential to drastically decrease morbidity and mortality in the US and worldwide.

Chronic HBV Infection Worldwide

Hepatitis B disproportionately affects certain regions of the world. The burden of disease is particularly high in East and South East Asia as well as large parts of Africa (Figure 1). However, weak surveillance data, lack of public health infrastructure, and

lower life expectancy make HBV and its chronic effects difficult to track on the African continent. Thus public health professionals have largely focused on Asia.

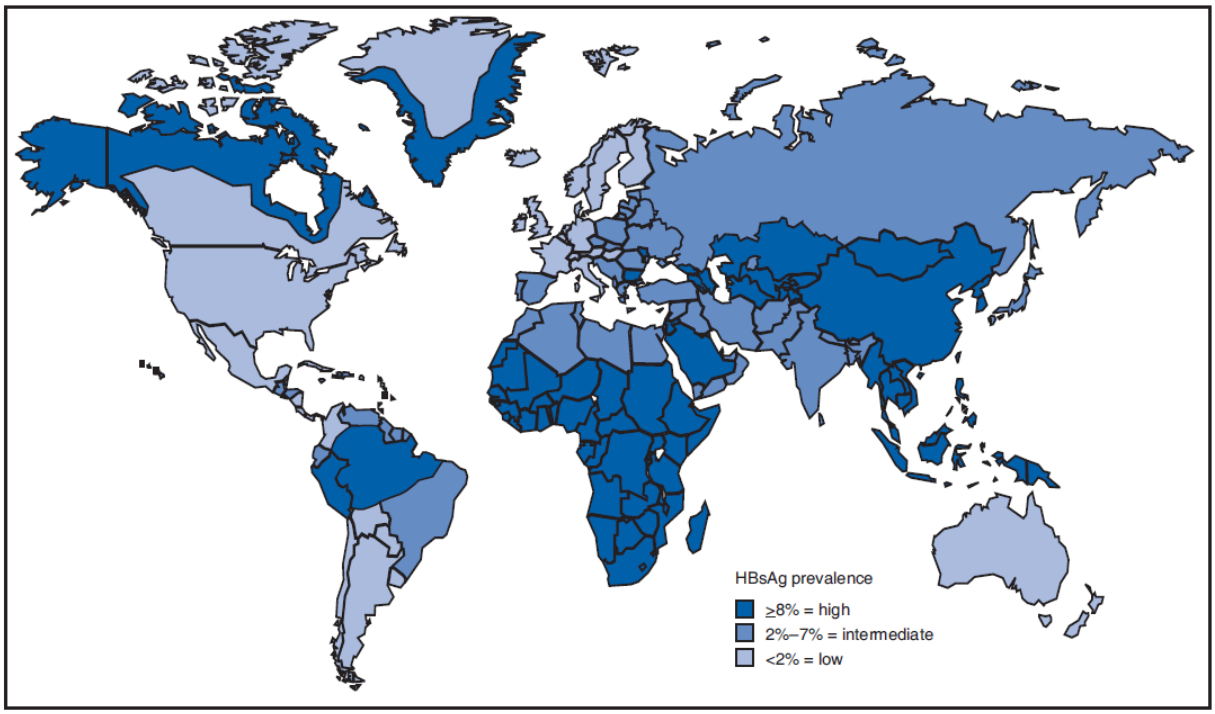

Figure 1: Geographic distribution of chronic hepatitis B infection worldwide, 2005 [5]

One-third of the world's 350 million carriers are Chinese. 360,000 of the half million people that die yearly from liver cancer are from China, Hong Kong, Japan and Korea alone [6].

Chronic HBV Infection in the Unites States

HBV is a major cause of chronic liver disease in the US. The CDC estimates that 800,000 to 1.4 million people in the US are currently living with chronic HBV infection. The direct medical costs of HBV have been estimated to be $5.8 million based on cases reported in the year 2000 among 5-24 year olds [7]. HBV disproportionately affects Asian-Pacific Islanders (API) in the US. Although they make up only 4.5% of the general population, they account for over 50% of carriers [8]. Some studies have found rates as high as 15% in some Asian American populations. It is estimated that 1 in 10

Asian Americans is chronically infected. The largest risk factor in these groups is birth in endemic countries in Asia where chronic infection rates are as high as 20% [9]. This association is most likely due to the high levels of infection in mothers from endemic areas. Although some studies have estimated that one third of infected Asian Americans are unaware of their infection, data on other populations is lacking. Overall, the CDC estimates that about 65% of the general population is unaware of its infection status.

Intervention Strategies: Vaccination, Screening, and Education

Vaccination

The first vaccines for hepatitis B were plasma derived and licensed in the early 1980's. These were replaced by vaccines designed using recombinant DNA at the end of the decade. Current commercial vaccines developed after 2000 include combinations of hepatitis B vaccine with hepatitis A and DTaP (Diptheria-Tetanus-Pertussis-Polio) [10]. The combination of basic vaccinations in one dosage allows for simpler administration to patients and requires less storage space in facilities. Combination vaccines also allow for less frequent visits to health centers. Vaccines usually include 3 doses with some variation and have proven to be very effective – completing the 3 doses protects 95% of infants, children and adolescents, over 90% of adults aged 40 and younger and over 80% of adults over the age of 40 [11].

Initial local, regional and even national strategies focused on high-risk individuals and included testing pregnant mothers for HBV and vaccinating at-risk infants and high-risk groups such as homosexual men, healthcare workers, and patients in sexually transmitted disease clinics. However, these strategies proved ineffective due to problems such as the reaching high-risk group members. Furthermore, the increasing risk of

transmission from immigrant populations from areas with high endemicity necessitated a new perspective on HBV prevention [12]. In 1991, the World Health Organization's (WHO) Global Advisory Group of the Expanded Programme on Immunization (EPI) recommended that hepatitis B be integrated into the infant vaccination program in all countries with an emphasis on those with high endemicity (greater than 8% carrier rates) [13].

Infant Vaccination

Infants born to mothers who are infected can be protected by administering the first dose of the vaccine series 12-24 hours after birth. While immunolobulin is also recommended, some studies have shown that vaccine alone is just as effective – this has important implications in areas where cost and location may prevent access to immunoglobulin [14]. Infant vaccination is particularly important because infants are most likely to develop chronic infections if exposed to the virus. As individuals age, their reaction to exposure to HBV changes – they become progressively less likely to develop the chronic form of the disease and more likely to develop symptomatic acute infections. While more than 90% of exposed infants become chronically infected, only 25-50% of children aged 1 to 5 and 6-10% of older children and adults develop chronic infection (Figure 2).

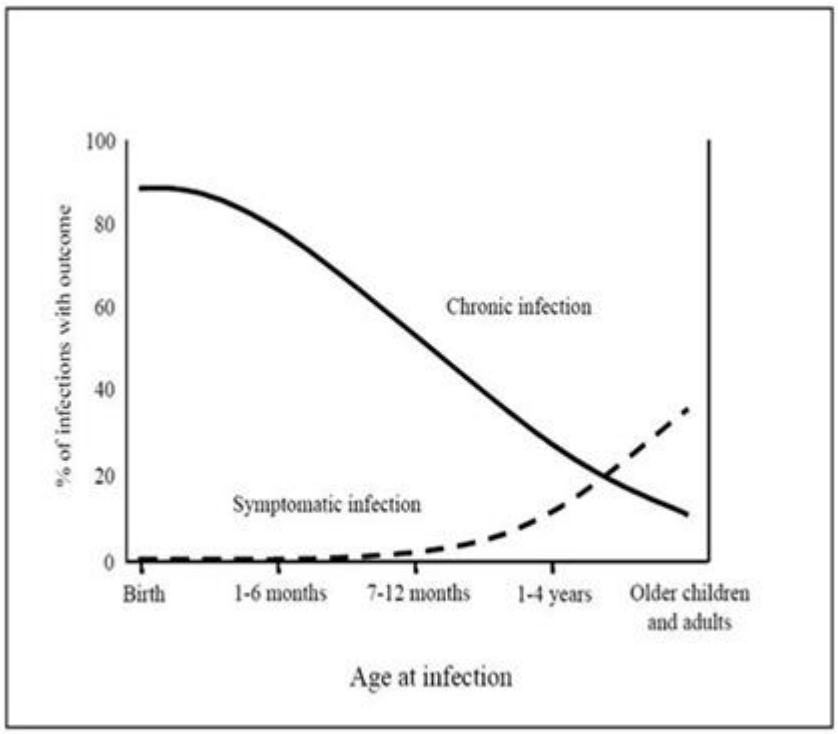

Figure 2: Rates of chronic infection versus age [15]

Chronic carriers develop HBV-related liver cancer at 100-300 times the rate of uninfected individuals [16]. Partially as a result of this age-dependant infection scheme, large-scale infant and child vaccination programs have seen monumental decreases in chronic and acute infection rates. The vaccine is now one of the most widely used in the world and has been called the first anti-cancer vaccine and the first vaccine to prevent a sexually transmitted disease [17]. Since the primary goal of infant vaccination and immunization is to prevent the development of chronic infection and its associated diseases, evaluating the effect of immunization campaigns can be difficult. Monitoring acute cases and conducting cross sectional studies assessing the presence of immunity may provide short-term evidence, however, national chronic infection rates may take generations to experience significant changes. Furthermore, long-term decreases in cancer and chronic infection rates will only be available in environments with strong

surveillance infrastructure.

Vaccination in the US

In the US, the rate of new acute HBV infection has decreased over 80% since 1991 when a national strategy to eliminate HBV infection was implemented. Part of this strategy included recommending vaccination of all children with provisions to vaccinate adolescents and adults as well. As a group, children as a have experienced the greatest decline in acute infections. Rates have dropped from 3 cases in every 100,000 children under the age of 20 to 0.19 cases (94% reduction) [3]. In the Alaskan native population, routine immunization was associated with decreases in serological evidence from nearly 8% to 1.5% in children. While 3.2% of children were chronically infected at baseline, ten years after the implementation of vaccination among all children, a study found no child under 10 was chronically infected [18]. Similar effects were seen in the Asian immigrant child population in Georgia where the number of children who had been infected by HBV decreased from more than 20% in 1992 to fewer than 2% in 2001 [19]. As of 2004, over 92% of children aged 19-35 months in the US had completed the 3-dose vaccine regiment. Data in 2003 reported that 50-60% of adolescents were vaccinated and as of 2005, 34 states require HBV vaccination for school entry [20].

Although children have seen promising protection rates, there are a series of challenges and concerns with protecting adolescents and adults who frequent health clinics less often and are more likely to fall into groups with increased risk for transmission (e.g. individuals with multiple sex partners, injection drug users, health-care and public safety workers and household contacts of infected persons). In order to eliminate hepatitis B in the US, efforts to identify and vaccinate unvaccinated adolescents

and adults must be escalated. Rates of acute hepatitis infection remain the highest in adults, who accounted for 95% of new cases reported in 2005. Although acceptance of vaccination is high among adults, the low coverage rate reflects a lack of access and services available to those adults that participate in high-risk behavior. Adult infection rates are expected to decline as vaccinated children and adolescents age, but there remains a need to reach currently unprotected adults [5]. The most promising solutions to this problem is to offer screening and vaccination services at places where at-risk adults are likely to be seen by professional service workers such as in sexually transmitted disease treatment and testing centers, correctional facilities and drug treatment centers [21].

Vaccination Worldwide

Since the 1991 WHO recommendation that all countries include HBV in their vaccination programs, great progress has been made toward reaching this goal. An estimated 164 countries have introduced the vaccine into their national immunization schedules (Figure 3).

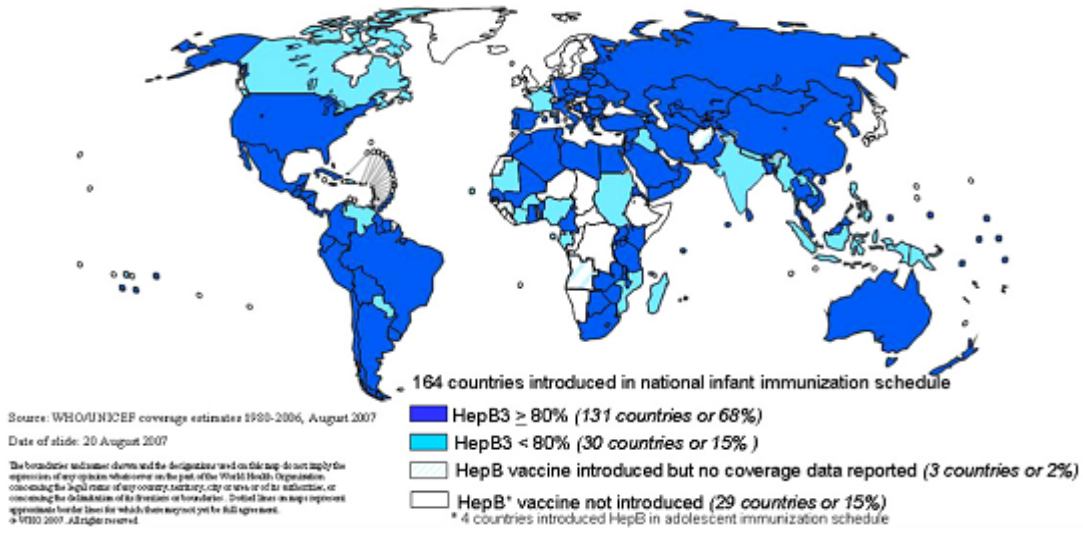

Figure 3: Countries (coloured) where national infant hepatitis B vaccination has been introduced universally in the immunization schedule (2006)—infant third dose hepatitis B vaccine coverage [22]

Of those, 131 report coverage of over 80% after the third dose. As a result of new policy implementation, it is estimated that global infant vaccination coverage of hepatitis B has increased from less than 1% in 1990 to 30% in 2000 to 60% in 2006 (Figure 4).

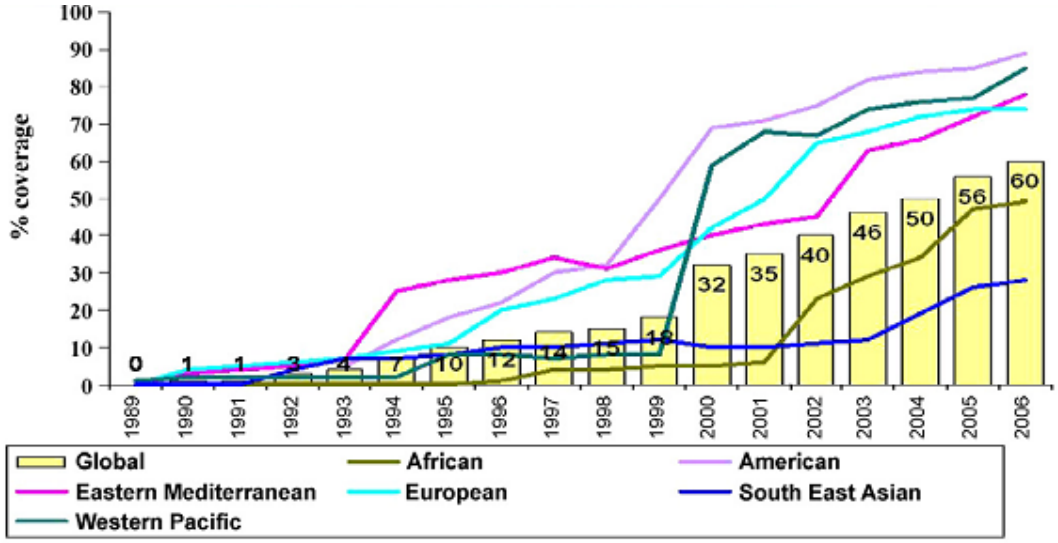

Figure 4: Percent coverage of countries that introduced hepatitis B vaccination, 1989–2006 [22]

The recent expansions in coverage in developing countries have been made possible by the Global Alliance for Vaccines and Immunization (GAVI) who have given technical and financial support to 74 countries starting in 2000 [23].

Taiwan is an important example a modern, industrialized nation that has made great progress in reducing chronic HBV infection. Taiwan is one of the many Asian nations in which chronic infection rates were alarmingly high. In 1981, 90% of the general population had been infected with HBV during their lifetime and 15-20% of the population was chronically infected. Liver cirrhosis and cancer remain among the ten leading causes of death in Taiwan. A study looking at over 20,000 government workers from 1978 to 1980 found that over 3000 had been exposed to HBV. While 49 of these

men developed liver cancer, only 1 non-carrier developed cancer indicating a 273 fold higher risk among HBV carriers [2]. In 1984, the government began a free mass vaccination program which has resulted in monumental effects, reducing HBV carriage rates in children from nearly 10% in 1984 to less than 1% in 1999. Interestingly, there was also a decrease in infection rates of children who were not immunized suggesting the presence of herd immunity effects. Taiwan's immunization program has been a model success story, but was facilitated by a relatively concentrated population, strong government support and well-managed health infrastructure. Monitoring and evaluation has been successful due to progress being closely followed by a study group at National Taiwan University. The remarkable accomplishments achieved in reduction of HBV infection make Taiwan's program an exemplary model for other industrialized countries [2].

Vaccination Post-infancy

Since the WHO recommended infant vaccination in all nations, especially those with high endemicity, many countries have responded to that call. However, very few have elected to vaccinate both infants and other high-risk age groups such as adolescents. Studies have shown that in many nations, especially developing countries, the cost of the vaccine itself remains a large barrier to immunization efforts [24]. Since adolescents are less likely to develop chronic infection and will be replaced by supposedly immunized children in the coming decades, the cost effectiveness of a catch up vaccination program has been questioned. In 2010, a study done in China sought to prove that a national policy for adolescent vaccination of children up to age 20 would be cost effective. China is one of the nations with the highest burdens of HBV infection – 37-50% of HBV-related

deaths worldwide are Chinese. In some regions nearly 20% of the population are chronic carriers. Although routine vaccination began in 1992, high prices and user fees made vaccination only available in urban areas and in the wealthier parts of China. In 2002, hepatitis B vaccination was added to the National Immunization Program and China built partnerships with GAVI to ensure access to even the poorest provinces. In 2005, new policy mandated that the vaccine be entirely free of charge to all Chinese citizens [25]. These steps have resulted in significant decreases in chronic infection rates in the last decade.

Screening

National policies of infant vaccination theoretically remove the need to screen children and mothers. Thus, screening has not been a major priority for health departments and vaccination campaigns. However, screening is essential to ensuring that children and adults have positively responded to vaccination and are indeed protected from infection. In some areas, screening may reveal a lack of adherence to infant immunization policies and allow identification of unprotected individuals who can still be protected. Equally important is the identification of those who are infected and require monitoring and treatment.

Screening at early ages for HBV is especially important because of the late onset of symptoms associated with liver disease. Serologic testing for hepatitis B surface antigen (HbsAg) is the primary method of identifying chronically infected individuals [26]. In 2008, the disproportionate infection rates among Asian Americans had prompted the CDC to recommend that all persons born in endemic countries (most parts of Asia and Africa) and persons born to parents from endemic countries get screened for HBV

infection [26]. Even those vaccinated through catch-up programs as children or adolescents should be screened as they are likely to have been exposed to HBV before vaccination [6]. Economic studies carried out in the US in 2007 have shown that routine screening for all adult API Americans is cost effective, further promoting screening as an important intervention in fighting HBV.

Screening U.S.-born Persons

In 1991, the Advisory Committee on Immunization Practices (ACIP) recommended HBV vaccine for all newborns. Such policies, along with policies that require proof of vaccination for primary school enrollment, have led many to believe that persons born in the US receiving regular immunizations are protected from HBV. The CDC does not recommend the screening of persons born in the US who know they have been vaccinated against HBV as infants. However, a shockingly small portion of regularly immunized infants receive proper HBV vaccination. Many Americans recall being vaccinated in grade school, but vaccination following transmission at birth does not protect the individual. In order to prevent perinatal transmission, infants must be vaccinated at birth. A study in 2010 by the American Academy of Pediatrics found a clear gap in hospital policies to prevent perinatal transmission of HBV. Among infants born to HbsAg positive women, 13.7% did not receive birth doses. Among women with unknown HbsAg status, 47.6% did not receive birth doses and among HbsAg negative women, 30.9% did not receive HBV vaccinations before discharge [27]. Another survey done by the National Immunization Survey revealed that for the January 2003 – June 2005 birth cohort, less than 50% of newborns had received timely birth doses (e.g. first dosage received before hospital discharge for infants born to HBV negative mothers and

within 12 hours of birth for infants born to HBV positive mothers). Written hospital policies were the strongest predictor of whether newborn vaccination doses were given properly [28]. In order to ensure adherence to CDC and ACIP recommendations, there must be an emphasis on provider education and regulation of hospital policies and practices. In the meantime, there may be significant gaps in US-born persons protected from HBV. Furthermore, vaccination in grade school may provide a false sense of security for many adults born in the US.

Prompt identification of infected persons is important not only to prevent the onset of liver disease but also to prevent transmission to others. Screening for chronic HBV infection is consistent with the generally accepted public health screening criteria: 1) chronic hepatitis B is a serious health disorder that can be diagnosed before symptoms occur; 2) it can be detected by reliable, inexpensive, and minimally invasive screening tests; 3) chronically infected patients have years of life to gain if medical evaluation and/or treatment is initiated early, before symptoms occur; and 4) the costs of screening are reasonable in relation to the anticipated benefits [29]. Early identification coupled with medical management and vaccination of close contacts can lead to significant reductions in liver disease and cancer burden.

Education

Education has only recently become incorporated into national and community wide campaigns to combat HBV. Provider education has been linked to infant vaccination programs in order to ensure adherence to hospital policies and accurate interpretation of HBV blood tests [28]. However, most national campaigns have relied on infant vaccination policy to reduce HBV rates and diverted little resources and

attention to spreading public knowledge about the importance of HBV. The lack of public awareness contributes to high risk among several adolescent and adult populations: those who have not been vaccinated, those who have been vaccinated after infection, those that are exposed to HBV by close contacts and occupation, and those that engage in risky behavior such as intravenous drug use and unprotected sex. Education and awareness is especially important in immigrant populations originating from areas of high endemicity who face language and cultural barriers when accessing health services.

The Asian Liver Center and the Jade Ribbon Campaign

Although infant vaccination has caused chronic infection rates to plummet, the fight against HBV must include education and screening as key components. The Asian Liver Center (ALC) at Stanford University is a non-profit organization founded in 1996 to address the problem of hepatitis B in Asians and Asian Americans. Its approach represents a modern strategy to addressing HBV in communities nationally and abroad. It focuses on three components: outreach and education, advocacy, and research. Its outreach and education arm includes partnerships with community organizations, community events, and youth programs such as Team HBV (undergraduate student organizations raising awareness on university campuses) and the Jade Ribbon Campaign (an international campaign dedicated to spreading awareness of HBV worldwide). Its advocacy arm has rallied support from prominent local and national legislators as well as government organizations to bring attention to the cause. Finally its research arm conducts scientific research in order to improve diagnostic and treatment capabilities for HBV and liver cancer as a whole [30].

Rationale for Intervention Design and Community-Based Approach

The public health danger associated with HBV is clear. Great strides have been made in prevention through infant vaccination. However, this strategy leaves large populations still at risk and unprotected. The projects discussed in the following report are inspired by the work of the ALC and promote education, screening and vaccination to address at-risk populations. They focus on two separate communities: the Emory University campus, and the Asian American community serviced by a local community center. The primary goal of both projects is to support education, screening and vaccination at the local community level. The figure below depicts a conceptual framework for the interventions in both projects (Figure 5).

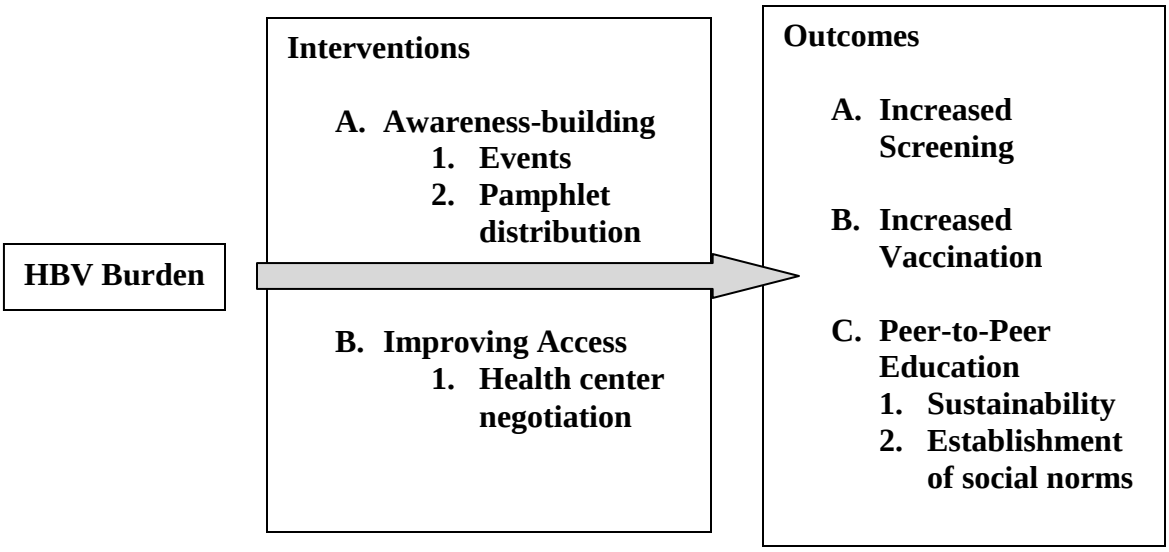

Figure 5: Conceptual framework of community level interventions

Intervention Design

The key intervention design in both projects is the provision of education to raise awareness in order to promote preventative and healthy behavior, in this case, screening and vaccination. Studies have shown that raising awareness of pressing health issues can elicit healthy behavior from community members and contribute to changing social

norms [31]. In some cases, this strategy alone may be sufficient. For example, students with strong medical insurance may be able to be screened and vaccinated for free once aware of the dangers of HBV. However, access issues may also present a barrier to some community members. Therefore, education is linked with reducing financial barriers to screening and vaccination. Studies have shown that reducing financial barriers to preventive services increases usage [32].

Community Based Approaches

Although both projects are meant to address vulnerable populations in each community, they also take advantage of community-based approaches to support sustainable health interventions. Figure 6 displays the target audiences of each project.

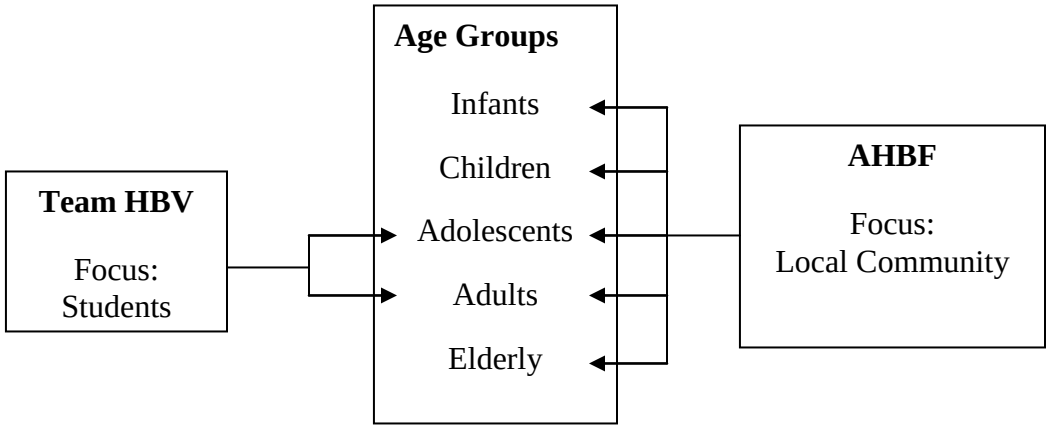

Figure 6: Schematic diagram of target populations for Team HBV and AHBF

University Context

The experiences of Team HBV chapters across the nation have shown that college student organizations have great potential to create change on campus and in the community. There are several reasons to target students in the university context. First, the high concentrations of students in a confined area make educational events more logistically feasible. Second, students are more likely than community members to have the time and passion to devote to supporting a cause. Recruiting students and

empowering them to teach others has strong implications for sustainability. Studies of the promotion of other healthy behaviors such as breast self-examination have shown that peer transfer of knowledge in college students is effective and sustainable [33]. Furthermore, university students are good targets because they are poised to become future leaders. Embedding norms of healthy behavior in students may result in dissemination of healthy behavior into new communities long after the student graduates [33].

Although university campuses can produce successful interventions by leveraging student interest, college and graduate students also represent an at-risk population. The social environment and the age at which students reach college can promote risky behaviors such as unprotected sex and sex with strangers, especially in the presence of alcohol [34]. Although many schools require proof of vaccination, students who may have been infected before vaccination can act as a reservoir and unknowingly spread the virus among peers. Universities are also home to a large number of international students, many of whom are pursuing graduate degrees. These students may be born from areas of high endemicity and are therefore more likely to be chronic carriers. Furthermore, the older age group associated with graduate students may suggest that students were born before infant immunization campaigns took full effect.

Local Community and Community Center Context

Local communities and community centers have their own potential for producing effective and sustainable health interventions. Many community centers and local non-profit advocacy organizations have established credibility in their communities may have the resources to function as a major partner. The San Francisco Hep B Free campaign in

Bay Area, California experienced great success by relying on a series of partnerships. Health education sessions can be added on to already existing services such as language classes and community meetings. As partnerships grow, additional services can be included depending on the resources of the community. Finally, community involvement promotes ownership of health interventions which contributes to sustainability [35].

Community centers are also key to reaching at-risk populations and can provide valuable access to community members. Unlike campus populations, community centers often work with families, extending the reach of education, screening and vaccination efforts to all age groups. In addition, educated family members, concerned for the safety of their relatives, may be more effective than college students in spreading information and raising awareness.

The use of both universities and community centers provide models for addressing vulnerable populations in sustainable and effective manners. Evidence of the success of similar approaches makes a strong case for the rationale behind these strategies. The following project report details the lessoned learned from implementing these models at Emory University and the Center for Pan Asian Community Services.

Project Report: Team HBV at Emory and Atlanta Hep B Free: Fighting Hepatitis B in Two Communities in Atlanta, GA.

Abstract: This report encompasses a two-pronged approach to addressing hepatitis B virus (HBV) in the Metropolitan Atlanta Area. The first focuses on Emory University and the second, on a community wide health campaign called Atlanta Hep B Free. Both projects were launched with no initial funding in the fall of 2009 and both take advantage of awareness-building strategies and community-based approaches. Two years of development efforts have yielded some significant successes along with the identification of many areas for improvement.

Key findings:

-Effective screening, vaccination, and awareness campaigns on university campuses can be generated by engaging undergraduate students and forming student organizations

-Knowledge of university resources and student practices is crucial to successfully recruiting students and capitalizing on their interest in the cause

-Undergraduate student groups can be an effective source of enthusiasm and manpower for campus and community activities, but require leadership and initiative from members to remain sustainable

-Student health clinics can be leveraged to support causes relevant to the student population

-Community health campaigns require strong partnerships to build a base from which to launch further activities

Community 1: Emory University

Team HBV

Team HBV was founded in 2006 by Amanda Wong and Jian Zheng, students who had interned with the Asian Liver Center (ALC) and sought to bring the fight against hepatitis B to their university campuses. Team HBV has grown to 14 chapters and now represents a major outreach arm of the Jade Ribbon Campaign Today. The national network not only targets college campuses, but their surrounding communities. Members of Team HBV have held awareness events on campus and in the community, with some

chapters going so far as to partner with pharmaceutical companies to hold large scale screening and vaccination campaigns [30].

Central Goals:

- Train and inspire student leaders around the nation to educate their surrounding communities
- Organize educational events such as lecture seminars and documentary screenings
- Promote awareness through a variety of media outlets including educational brochures and online videos

Supporting Goals:

- Build fruitful partnerships with other student clubs and with local groups in the community, ranging from churches and non-profits to restaurants and corporations
- Raise funds towards the global Jade Ribbon Campaign
- Practice political advocacy to garner federal aid for HBV awareness and vaccination programs
- Establish Team HBV chapters at undergraduate universities across the nation

Team HBV at Emory:

Targeting vulnerable populations

Emory is an especially important target for hepatitis B intervention due to the large number of Asian-Pacific Islander students. Approximately 33% of the Emory University freshman class in the fall of 2010 reported themselves as API students. The total number for the undergraduate class in 2010 was nearly 7,000, while the graduate student population was nearly 10,000 [36]. Assuming that the proportion of API students is consistent across these populations, Emory University is home to nearly 6,000 API students. It is estimated that 1 in 10 Asian Americans are infected with HBV and without proper management, 1 in 4 of them will die from HBV related illness [37]. Therefore, screening has the potential to identify up to 600 infected persons and thus prevent 150

future cases of premature mortality within the Emory community each year. These estimates do not take into account the even higher risk associated with the large number of international students and graduate students born abroad in highly endemic regions (Africa and Asia). Although Emory requires HBV vaccination for enrollment, many students and staff who believe they are vaccinated may still be at risk. Students who did not receive a timely birth dose may have been vaccinated after already becoming infected at birth, giving them a false sense of security. Since persons with chronic HBV infection serve as the reservoir for new HBV infections in the Emory community and in the US, identification of these persons through screening is a critical complement to vaccination strategies for elimination of HBV transmission.

Genesis:

Team HBV at Emory was built on the success of the many chapters that already existed during its creation.

In the fall of 2009, the recruiting process began followed by recognition of the new chapter by the Team HBV National Advisory Board.

In the winter and spring, an application for recognition of the student group by the university was submitted but rejected due to a lack of strong undergraduate leadership. Soon after, an executive board was created.

Just before the beginning of the new academic year, Team HBV gathered its executive board to plan and carry out its first outreach event during the first week of school. A plan was made for the remainder of the year.

Activities:

In April of 2010, the Center for Pan Asian Community Services (CPACS) arranged a meeting time to train the emerging core group of Team HBV in order prepare them to teach community members through CPACS venues such as English classes.

In August of 2010, Team HBV at Emory established it presence on campus by participating in the Student Activities Fair, an event aimed at providing student organizations with the opportunity to advertise and recruit. Short and informal surveys

were designed and carried out to get a baseline level of knowledge of students and ice cream was used as a cheap incentive to get students to participate. Following the survey, students were educated and brochures were given out to encourage further reading.

The same month, members approached the Emory student clinic to advocate for the reduction of HBV screening costs for high-risk students. Clinic staff considered the proposal, but asked for additional information due to financial concerns.

In October of 2010 Team HBV participated in its first event with CPACS, the Together Empowering Asian Americans (TEA) Walk. The event had over 1,500 participants. After the walk, Team HBV had a booth where members educated participants and distributed baked goods and educational materials.

Just weeks later, Team HBV sent its president to the second National Team HBV Conference to network with other chapter executive board members, participate in speaker led seminars and learn more about emerging advocacy strategies.

In November of 2010, Team HBV had its second major educational event during a small night market. Members sold hot chocolate and educated students while playing HBV-related media on a projector nearby.

In March of 2011, Team HBV opened the new year with a major victory. After consulting with Vaden, the student clinic at Stanford that pioneered reduced cost screenings, Team HBV members met with Emory Student Health and Counseling Services Executive Director Dr. Michael Huey. An agreement was made to reduce the fee for HBV screening and support provider education at the beginning of the 2011-2012 academic year.

In April of 2011, Team HBV turned its focus to national Hepatitis B Awareness Week, an event held in April across national chapters. It held three very successful events over the course of the week, educating hundreds of students and raising money for future education efforts.

Discussion:

The process towards establishing Team HBV represents a two-year effort to take an idea to reality. The goal was to raise awareness of a pressing problem in the Emory community through the creation of sustainable undergraduate-run student organization that would continue to function after the impetus from the founder had dissipated. In the process, there were a series of roadblocks and difficulties that had to be overcome.

Nevertheless the ultimate success of the organization shows that community members can be recruited to support public health causes. Although the majority of the first two years were spent organizing and generating a sustainable student organization, the genesis of Team HBV at Emory provides some key findings that are applicable to the broader public health context.

Recruiting Members and Leaders Within the Community:

One method to effectively appeal to community members is to recruit their peers as teachers and advocates. Although some communities may respond to efforts led by authority figures, often it takes the vested interest of members in the community itself to rally their peers to the cause. Furthermore, initiatives are much more likely to succeed if designed by community members who are more likely to have a much better idea of how to approach their peers. Studies in the US have carefully documented the value of community consultants in recruitment and in the designing of interventions. Consultants not only provided cultural competency, but also helped better target specific populations [35]. Ideally, the impetus to draw the attention of a few particularly passionate community members who can then become the leadership of the group may be enough to yield a sustainable leadership model. These leaders would then recruit new members from the community who could replace them when they left the community.

In the context of Team HBV at Emory, an undergraduate student group was envisioned as the most effective way to reach out to the university community. Recruiting leaders, particularly genuine interested undergraduates, would allow the sharing of the large amount of tasks and responsibility associated with the creation of a new organization and the recruitment of more members. Perhaps more importantly, shared

ownership of the project early in the process would convey a sense of ownership and empowerment among undergraduates to act on behalf of the organization. The benefits of this strategy can be applied to the broader public health context. Although various interventions may cater to large groups of staff from outside the community, it is clear that community involvement, and partial, if not total community ownership, provides a much more sustainable model. Studies in the international context have shown that participation leads to empowerment, and that empowerment can contribute to sustainability [38].

Community Context:

Resources and conduits for reaching the target audience in awareness or advocacy campaigns are always a consideration. It immediately became clear that the emerging group of Team HBV leaders would need to consider not only the attitudes and background of the student body (its target population), but also the resources of the university itself. For example, Emory University uses an electronic conference system that functions similar to a forum as its primary form of electronic communication. Students must check various forums that they subscribe to. This system makes it less likely for them to read general announcements. Postings to the announcements conference returned minimal interest from the target population. It was found that posting to conferences associated with specific interest groups such as Asian culture groups and global health groups would potentially provider greater yields. Leaders of these organizations were much more receptive and allowed Team HBV members to give short presentations at meetings. These talks in and of themselves helped to recruit the vast majority of Emory's Team HBV executive board. This is a very different experience

from that at Stanford University, where general email lists are commonly used to distribute information and recruit participants to various events and groups. Prior knowledge of the methods of communication favored by and the level of receptiveness expected of one's target audience would have led to more effective marketing of the organization and its values.

Discussions with early members of Team HBV also revealed that Emory students appeared more likely to gravitate toward already established volunteer organizations than new groups that presented some degree of risk of dissolving – even if new groups offered leadership opportunities. Again, this experience differed from Stanford University where students were more eager to take on leadership positions in new groups. These lessons and those like it were valuable as Team HBV planned future events. Early input from community members and consideration of the campus context was critical in avoiding wasting resources on ineffective strategies and maximizes resources on effective alternatives. This theme resonates with broad experiences with public health efforts, both domestically and globally.

Maintaining Interest and Membership:

Team solidarity is crucial for growing organizations to succeed, especially when the group is small and participation is on an entirely voluntary basis. Since community members must volunteer their time and effort to make the project successful, they must feel they have a stake in the group. If interest in the cause dwindles, or several members drop out, morale may drop resulting in even higher dropout rates and may halt ongoing group initiatives.

The biggest concern for a grassroots organization in its formative months and years is maintaining interest and solidarity among members. Several strategies used to address this problem included: keeping members interested by continuing engagement among group members (i.e. feeling vested and involved, and sharing in achievements and failures); holding meaningful meetings and activities such that members feel their time is not being wasted on this endeavor.

Legitimacy also prevents individual members from abandoning start-up organizations. In this case, applying to become a recognized university student organization would provide such legitimacy. However, challenges in this example point again to managing the context and provides lessons for communicating with and establishing buy-in from stakeholders and authorities. Coordinators of community health campaigns, for example, must learn to balance their responsibilities while also upholding the interests of both stakeholders and authorities. Skillfully navigating these erratic political and bureaucratic channels ultimately also creates a sense of ownership and solidarity in the community.

Communication and Teamwork:

Lack of team cooperation and cohesiveness is also a potential barrier to a successful health project. Disagreements between members can cause a breakdown in group dynamics which can halt initiatives.

Continued participation in events builds trust and teamwork within organizations. Organizing events, conferences, regular communication channels, and socializing to share successes improved delegation, accountability, and created social pressure to remain responsible and dedicated. This strategy is especially important when bringing

together members who may come from different backgrounds and interests. Project coordinators have much to gain from simply encouraging socialization and fostering positive relationships among group members and partners.

Evaluation and Impact

It is still too early to definitively evaluate the effects of Team HBV on long-term awareness, screening rates, and vaccination rates in the Emory community. However, preliminary effects can be seen in the number of students reached during awareness events and the permanence of initiatives started by Team HBV.

Baseline Survey

A survey of baseline knowledge of HBV among students recruited 132 students. The vast majority (over 90%) reported hearing of HBV, but many fewer (62%) were able to identify the number of people killed by the disease each year. The vast majority (over 90%) also said they did not know anyone affected by HBV. Most importantly, only 67% indicated they were vaccinated, 6% reported that they were not, and 27% reported they did not know. Since Emory University requires proof of vaccination for enrollment, there is a clear gap in knowledge of HBV vaccination status among students. Although many students claimed they had heard of HBV, most only knew that hepatitis B was an infectious virus and some confused it for HPV (human papilomavirus). The number of people killed by HBV was a multiple-choice question and it is conceivable that this improved the chances of achieving a correct answer. Finally, it is likely that many people did not know anyone affected by HBV because it is not commonly cited as the cause of death. A question about liver disease and liver cancer may have given a better representation of the proportion of students affected by HBV.

It is important to note that the survey was not scientifically rigorous. Although the target was Asian American students, survey respondents included students from all ethnic backgrounds. Some students asked questions about HBV before answering the survey, affecting their responses. Some students simply answered questions as quickly as possible and were solely motivated by the ice cream reward. In the future, questions will be better worded and other topics such as HBV transmission method may be addressed. Nevertheless, the convenience survey provides a preliminary idea of the lack of knowledge among students, points to a need for community education, and identifies the areas where knowledge is most lacking.

Awareness Events

Team HBV's first community event was participation in the TEA walk in support of its partner, CPACS. After the march, Team HBV members manned a booth educating community members and giving out pamphlets with jade ribbon themed cookies. The event drew approximately 1,500 participants and over one hundred pamphlets were handed out.

Team HBV has also held several other on-campus events, taking advantage of larger campus-wide activities in order to set up booths and fundraise alongside other student organizations. Students reached ranged from under 100 to several hundred depending on the size of the event. The most successful and recent event was the participation in Team HBV's national Hepatitis B Awareness Week. Chapters across the country picked a week in either April or May to hold events to raise awareness. Team HBV at Emory held three events in one week reaching out to over a hundred students

during each of the first two events and fundraising and educating over 500 students from both Emory and Georgia Tech during the final event.

Initiatives

Although awareness events contribute to general community knowledge, another primary goal of Team HBV at Emory was to coordinate efforts with the university student health clinic to ensure provider education and promote screening and vaccination. As a result, Team HBV approached student health to advocate for a policy change that would decrease the cost of screening for at-risk students. This strategy has shown promise elsewhere. A 2004 review of over 100 studies showed that economic incentives promoted protective behavior such as immunization over 70% of the time. Furthermore, the incentives that worked the best increased the ability of participants to purchase the preventive service [32]. In March 2011, the university health services representatives agreed to partner with Team HBV to reduce the cost of HBV screening and vaccination. Furthermore, there was also agreement to ensure providers are made aware of the risks of HBV, that Asian American groups constitute a high-risk group, and that providing a risk assessment tool for students online on its website may help individuals assess their own risk. Financial costs of such a policy change were concerning, however, persistence and seeking avenues that promote mutual benefits led to negotiations about price reductions and partnering to increase awareness and risk assessment.

Partnerships such as these highlight the importance of mutual benefit in public health interventions. There are always costs and tradeoffs, and it is unreasonable to request actions that would disrupt functioning or increase the opportunity or direct costs for one stakeholder. Provision of data to support a stance was also demonstrated here -

Team HBV's approach was to come to negotiations armed with statistics and evidence, supported by experiences encountered by the Stanford University chapter.

Next Steps:

As the leadership of health campaigns transfers to community members and projects begin to function independently of outside support, a major concern must be the sustainability of the campaign. The top priority for Team HBV is to maintain the momentum it has gained in the past year and focus on sustainability. Recognition as a legitimate university organization is one important step towards becoming a permanent presence on campuses. Now that the group is established and has held a series of successful events, the executive board must look to recruit general body members to serve as a broader volunteer base. It should also seek to recruit new potential leaders to take up the fight against HBV when current officers graduate. The nature of undergraduate organizations and other volunteer projects is such that emerging priorities for members can result in high turnover. Even leaders within the organization can be drawn away by other opportunities and unexpected events. Therefore, sustainable organizations must rely on the shared responsibility of executive boards and new leadership to strengthen the group's ability to withstand high turnover rates.

Conclusion:

The founding and establishment of Team HBV at Emory represents the materialization of an idea from a single individual interested in a particular cause. Although inspiration for its creation was derived from successful chapters across the nation, initiating the idea in a new location has led to key findings concerning the successful development of such student groups. It has become increasingly clear that the

context of each campus and stakeholder agendas play a key role in determining what kinds of strategies will yield the best results. The budding success of Team HBV at Emory displays the potential for graduate students or perhaps even professionals to inspire interest among undergraduates to work towards addressing health issues.

The principles and public health implications discussed may also apply to community led health projects outside the topic of HBV.

Community 2: The Asian American Community

Atlanta Hep B Free

Atlanta Hep B Free (AHBF) is a grassroots health campaign started concurrently with Team HBV at Emory. Although the campaign shares similar goals of raising awareness and promoting screening and vaccination, it focuses on the greater community rather than the university campus. As in the case of Team HBV, Atlanta Hep B Free borrows its title and inspiration from similar established and successful campaigns in the Bay Area, namely, San Francisco Hep B Free (SFHBF).

Asian American presence in Atlanta

The Asian American community in the Atlanta Metropolitan Area is a relatively new population, but one that has exploded in the past decade. The Asian population in Georgia has gone up 81.6% between 2000 and 2010. In Gwinnett County, where a majority of Asians in the Atlanta Metropolitan Area reside, the Asian population has nearly doubled to almost 80,000, representing close to 10% of the population [39] Although these numbers do not reach the same proportions as San Francisco (35% Asian), early identification and treatment of Asian American health issues are important as the subpopulation continues to grow at a rapid rate. The new community suffers from

both cultural and language barriers in the healthcare field. The Center for Pan Asian Community Services is one of the few community centers that have been established to address these problems.

The Center for Pan Asian Community Services

The Center for Pan Asian Community Services, Inc. (CPACS) is the first and largest service agency in the Southeastern region. For more than thirty years it has provided healthcare, health education, social and legal services, and youth programs to the surrounding community. CPACS seeks to serves immigrant, refugee and minority populations offering culture and language sensitive assistance to those in need [40].

Genesis:

From its onset, AHBF was intended to represent the larger, community wide health campaign component for the fight against HBV in Atlanta. As a result, its genesis began with research into the success of its predecessor in San Francisco. SFHBF derives its success from its ability to bring in various stakeholders and partners in order to reach a common goal.

In November of 2009, CPACS was contacted as a potential major partner in the fight against hepatitis B in Atlanta, recognizing the potential to leverage its medical clinic and community connections.

In the December of 2009, observation and interviews of Asian Liver Center personnel were conducted in order to gain insight into launching community campaigns.

In January of 2010, partnerships with the Georgia Department of Community Health were discussed.

The same month, contacts and involvement of CDC and Emory faculty yielded feedback on how to best proceed.

Activities:

AHBF was unofficially launched with CPACS in May of 2010.

In August of 2010, Team HBV and CPACS initiated efforts to seek financing in the form of grants. Efforts in this area continue.

Discussion:

AHBF vs. SFHBF

Attempting to recreate the success of SFHBF in Atlanta led to similar findings as those discussed in bringing Team HBV to Emory. There were a number of differences between the populations and resources in San Francisco and Atlanta, as well as differences in the resources and approaches taken. The creation of AHBF was led by a single individual without the support of an established non-profit and its staff (as in the case of SFHBF). Although the AHBF's target population is rapidly expanding, this is not a population of immediate interest to other local and federal stakeholders and therefore holds less driving force in this area. SFHBF enjoys the support from several prominent community leaders, many of whom are Asian American. In contrast, AHBF has struggled to find a champion for its cause. As a new population, Asian Americans in Atlanta face many more difficulties in expressing their concerns and receiving attention to issues that disproportionately affect their communities. Successful health campaigns in Atlanta must find ways to reach out to specific target populations and emphasize the disproportionate risk associated with Asian Americans and hepatitis B. Existing community resources such as CPACS must be leveraged and emerging leaders in these communities should be recruited to the cause.

However, the small size of the Asian American community provides some benefits. While the smaller target population can make large-scale advocacy more challenging, it also allows for less resource-intensive events. If adequate awareness in

small, but key communities and persons can be reached, education and knowledge will spread by hearsay as the community expands its influence in coming years. Prior studies have shown that popular leaders can have a distinct effect on improving behavior by acting as role models [41]. It is hoped that this trend can be reproduced on a community scale, allowing established social norms about health to spread along with the expansion of the community.

Investing in Partnerships

One of the most important findings in launching AHBF was the importance of maintaining productive partnerships. The launch of the AHBF campaign was meant to signify the start of monthly community education sessions that CPACS had trained Team HBV to lead. Ideally, the sessions would spark conversation in the community and AHBF could go on to hold awareness events in the community and screening events at CPACS. However, there have been challenges with this campaign, primarily due to disruptions caused by changes at the community center.

Maintaining enthusiasm among CPACS and community leadership has been a challenge. Continuing collaboration must involve consistent and persistent communication, investments, and building of trust. Both partners must be willing to devote resources to collaboration. Other priorities have reduced communication between Team HBV and CPACS, and a lack of sustainable financing makes it easy to avoid responsibility for maintaining the impetus.

Evaluation, Impact and Next Steps:

Unlike Team HBV, AHBF has struggled to get off the ground and has had little impact outside the building of partnerships. An initial recruitment of partners was

successful, but many organizations such as Rollins School of Public Health, the CDC, and the Georgia Department of Community Health stakeholders were unsure as to how they could contribute to the cause. Without already established activities and community success to cite as evidence, partners had little incentive to invest in the movement. Furthermore, even AHBF organizers were not sure of how their partners might be leveraged towards the cause. A potential solution to this problem would be to ensure preliminary development of AHBF from within the community as a first step.

Reaching out to the community requires establishing connections with community members. Although CPACS was an ideal partner for this job, its distance from Emory and the lack of a strong bond with Team HBV has made collaborative efforts difficult. However, realizing inter-dependencies may also be a route to establishing better working relations. If Team HBV is to begin outreach in the community, building a strong partnership with CPACS must be a top priority as this is the organization with the community connections. There are several possible approaches to achieving this goal: reestablishing collaborative relations by showing support at CPACS-sponsored events; increasing face time with staff and community members; and increasing efforts to fundraise. These strategies are not mutually exclusive and contribute to a similar goal: Giving credibility and trust to AHBF by displaying Team HBV as a reliable source of enthusiasm, volunteers, and passion towards the Asian American community. Once routine education sessions in the community are established, AHBF will be able to gain some momentum and recognition. As a result, other potential partners could be brought onboard to allow for expansion of activities. The development of community programs

would also give insight into what kind of support the community needs and how partners might best contribute to addressing those problems.

Conclusion:

Community health campaigns require even more groundwork and preparation than forming student organizations. The importance of building partnerships is the most critical component for a successful campaign. The most effective way to reach communities is through venues that are already established and trusted such as community centers. Major partnerships must be actively upheld through consistent collaboration and trust building. Only then will partners have incentive to invest and participate. Partnering organizations must believe that the health campaign is led by driven, passionate and responsible leadership. This requires the investment of time by campaign organizers not only in campaign related activities, but also activities that support the goals of partners. While gathering a wide array of partners/stakeholders at various levels (local universities, government institutions, and non-profits), it is important to share responsibility and ownership, the key first step is establishing a credible presence in the community [42]. Undergraduate students can reach outside their campuses and provide a great source of enthusiasm and manpower for community campaigns, but require direction and leadership.

Concluding Summary

Hepatitis B continues to burden hundreds of millions of people worldwide. While chronic carrier rates are declining due to infant vaccination policies, the next step in the fight against hepatitis B must address gaps in the protection of not only infants, but all other age groups who may be at risk. Awareness-building and improving access are

strategies that have shown promise in past studies and experiences. Community-based approaches are designed to target vulnerable populations while using community resources to produce effective and sustainable results. The project report reveals key findings including the importance of investing in partnerships and the potential of undergraduate students to provide sustainable energy and enthusiasm for public health causes. The experiences of Team HBV at Emory and AHBF provide preliminary evidence that with the right approach, grassroots health campaigns are possible without funding and without extensive human resources. Campaign coordinators must be dedicated and passionate in order to galvanize the community. They must be diligent in taking advantage of already existing community resources, and they must focus on sharing ownership if interventions are to be sustainable.

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