

Impact of Stigma on People Living with Chronic Hepatitis B

This article was published in the following Dove Press journal:
Patient Related Outcome Measures

Jayne Smith-Palmer¹ 
Karin Cerri²
Urbano Sbarigia²
Eric KH Chan³
Richard F Pollock¹ 
William J Valentine¹
Kristien Bonroy²

¹Ossian Health Economics and Communications, Basel, Switzerland;
²Janssen Pharmaceutica NV, Beerse, Belgium;
³Janssen Global Services, LLC, Raritan, NJ, USA

Background: People with chronic infectious diseases such as hepatitis B can face stigma, which can influence everyday life as well as willingness to engage with medical professionals or disclose disease status. A systematic literature review was performed to characterize the level and type of stigma experienced by people infected with hepatitis B virus (HBV) as well as to identify instruments used to measure it.

Methods: A literature review was performed using the PubMed, Embase and Cochrane Library databases to identify studies describing HBV-related stigma. For inclusion, articles were required to be published in full-text form, in English and report quantitative or qualitative data on HBV-related stigma that could be extracted.

Results: A total of 23 (17 quantitative and 6 qualitative) articles examined HBV-related stigma. The scope of the review was global but nearly all identified studies were conducted in countries in the WHO Southeast Asia or Western Pacific regions or within immigrant communities in North America. Several quantitative studies utilized tools specifically designed to assess aspects of stigma. Qualitative studies were primarily conducted via patient interviews. Internalized and social stigma were common among people living with chronic HBV. Some people also perceived structural/institutional stigma, with up to 20% believing that they may be denied healthcare and up to 30% stating they may experience workplace discrimination due to HBV.

Conclusion: HBV-related stigma is common, particularly in some countries in Southeast Asia and the Western Pacific region and among Asian immigrant communities, but is poorly characterized in non-Asian populations. Initiatives are needed to document and combat stigma (particularly in settings/jurisdictions where it is poorly described) as well as its clinical and socioeconomic consequences.

Keywords: hepatitis B, stigma, discrimination

Background

In many countries, people living with infectious bloodborne viruses such as hepatitis B virus (HBV), hepatitis C virus and human immunodeficiency virus (HIV) frequently face stigma and discrimination. Stigma associated with HIV has been well characterized, where it is a key barrier in terms of seeking both testing and treatment.¹ However, despite a much higher global prevalence,^{2,3} stigma associated with HBV is less well characterized, which may be partly attributable to a lack of political prioritization around HBV compared with the substantial public health and political initiatives focused on HIV.⁴

Stigma has previously been defined as

a social process, experienced or anticipated, characterized by exclusion, rejection, blame or devaluation that results from experience, perception or reasonable anticipation of an adverse social judgement about a person or group.⁵

Correspondence: Jayne Smith-Palmer
Ossian Health Economics and Communications GmbH, Bäumleingasse
20, Basel 4051, Switzerland
Tel +41 61 271 6214
Email smith-palmer@ossianconsulting.com

And Scambler et al further add that this judgment is “medically unwarranted.” Stigma can be further categorized as social (also known as public or enacted) stigma, internalized (self/felt) stigma and structural (institutional) stigma. In the context of HBV, an example of social stigma, which involves the endorsement of negative preconceptions or stereotypes by social groups, would be the assumption that a person living with HBV also injects drugs. Similarly, internalized stigma refers to stigma felt by people on an individual level and includes the anticipation of social rejection or negative stereotyping due to living with a bloodborne virus such as HBV. Structural stigma, which exists at a system wide or policy level, has not been documented in North America and Western Europe. However, structural stigma related to HBV has been reported in China. Here, it was only in 2007 that anti-discrimination legislation was introduced to prevent the denial or termination of employment on the basis of a positive HBV test and testing for HBV prior to employment or entrance to university was not banned until 2010.^{6–8}

The stigma directed towards people living with HBV emanates from multiple origins. These include preconceptions that a person may use drugs or may be sexually promiscuous as well as an irrational fear of contagion, often fueled by a lack of knowledge and understanding of transmission routes for HBV. In HIV the phenomenon of “intersectional” stigma has been reported. Intersectional or “layered” stigma refers to stigma due to “synergistic, mutually constitutive relationship between social identities and structural inequities”^{9,10} and can occur on an internal, social or structural level. In the context of HIV, and HBV, groups that already face discrimination or stigma such as people who inject drugs (PWID) or commercial sex workers are further marginalized by the association with higher prevalence rates of HIV and HBV. In Europe and North America, the main transmission routes for both HIV and HBV are horizontal, meaning that in these settings, a large proportion of incident cases of HBV occur in high-risk groups such as MSM or PWID, where HBV may be transmitted from person to person through high-risk sexual practices or the sharing of drug-related paraphernalia, respectively. In contrast, vertical transmission of HBV from mother-to-infant was a major transmission route in many Asian settings for prevalent cases. However, the incidence of vertical transmission in many countries, particularly in Southeast Asia and the Western Pacific region has declined substantially since the 1980s owing to the introduction of vaccination programs. For example, in Taiwan, which was the first country to introduce universal

vaccination in 1984, the prevalence of HBsAg declined from 9.8% in 1984 to 1.3% in 1994.¹¹ Indeed, as of 2013 infant vaccination programs were in place in 183 out of 192 United Nations member states.¹² This suggests that for HBV, intersectional stigma may be more relevant for North American and European people living with HBV than for those living with HBV in some Asian settings.

The implications of stigma related to living with infectious bloodborne viruses such as HBV, both on a social and clinical level, are manifold.^{13–16} Even prior to diagnosis the existence of stigma around a disease may result in those who suspect they may have been exposed to the risk of infection through horizontal routes delaying or avoiding seeking testing.^{13–16} This in turn may result in a lack of monitoring and clinical management and potentially a delay in treatment for those people that may require treatment to prevent the progression of their disease. From a public health perspective, a lack of awareness in terms of being infected with a bloodborne virus may potentiate the onward transmission of the infectious agent.

To more fully characterize HBV-related stigma a systematic literature review was conducted to identify articles on the subject and to provide a synopsis of the literature published to date as well as to identify instruments used to quantify HBV-related stigma.

Methods

Literature searches were performed using the PubMed, Embase and Cochrane Library databases. Search strategies were designed using high-level Medical Subject Headings (MeSH) terms supplemented with free text terms (full details of the search strings used are provided in the [Supplementary Materials](#)). All searches were performed on 7 November 2016. No time limits were applied to the searches but searches were limited to articles published in English. For inclusion, publications were required to be full-text publications (conference abstracts were excluded owing to the limited amount of data available and the potential for duplication with full-text articles). Limits were also applied to publication type such that publications that were letters, commentaries, editorials, narrative reviews, or case studies were also excluded. For inclusion, studies were required to either quantitatively or qualitatively examine stigma in HBV. Articles not in, or specifically related to, people living with HBV or not related to stigma (or where stigma was only mentioned in passing and was not a focus of the research) were excluded. Articles in mixed populations of people living

with HBV or HCV where data for the HBV subset could not be isolated were excluded owing to the potential for different levels of stigma in HBV compared with HCV.

First-round screening of titles and abstracts was performed independently by two reviewers using Sourcerer literature screening software (Covalence Research Ltd, London, UK).¹⁷ Any discrepancies following first-round screening were resolved by discussion. Second-round screening of full-text articles and data extraction was then performed.

Results

Literature Search Results

Searches of the PubMed, Embase and Cochrane Library databases yielded a total of 1498 hits and after removal of duplicates, a total of 1077 unique articles remained. A total of 991 articles were excluded during first-round screening, and a further 63 articles were excluded during second-round screening, leaving 23 articles for inclusion in the review (Figure 1).

A total of 17 articles quantitatively examined HBV-related stigma.^{18–34} and a further six articles provided a qualitative assessment of stigma, typically through either semi-structured interviews or focus group discussions.^{35–40} The quantitative studies included a total of 15 studies conducted in people living with HBV or in the general population about people living with HBV and two studies that were conducted exclusively in healthcare providers. Seven of these studies assessed stigma exclusively in people living with HBV,^{18,22,23,27–29,31} two of which also conducted separate analyses in people without HBV,^{23,31} and the remainder were conducted in general population samples.

Quantitative Assessment of HBV-Related Stigma

Analysis of the literature showed that, to date, the majority of studies assessing HBV-related stigma have been conducted either in countries in the WHO Southeast Asia or Western Pacific regions (in particular, China, Taiwan, Malaysia and Vietnam) or within North America in respondents self-identifying as Asian American, including respondents born in the US and respondents born in China, South Korea, Japan, Vietnam and Cambodia. In terms of methodology, most included studies used custom-built surveys, and frequently stigma was assessed in parallel with HBV-related knowledge. In terms of custom-built surveys, several were based on

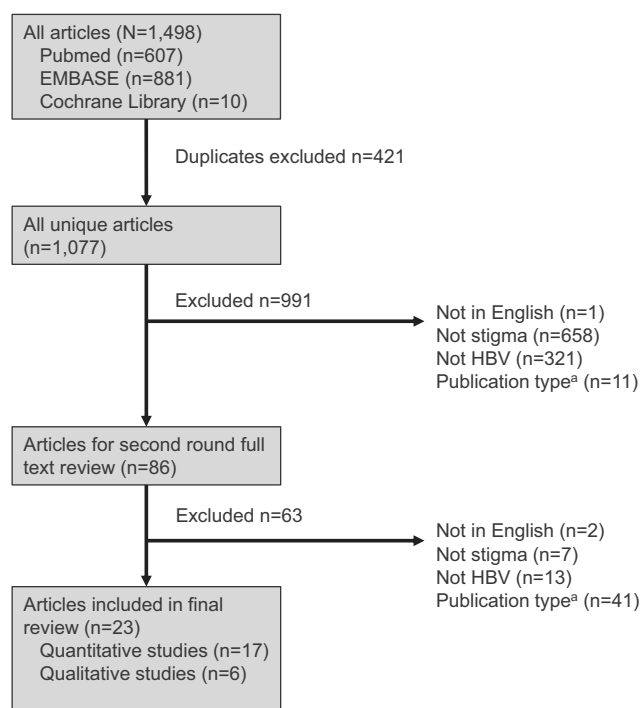


Figure 1 Summary of literature review process.

Notes: ^aPublication type refers to articles that were excluded on the basis of being published in abstract form only, as well as case studies, commentaries, editorials, letters and narrative reviews.

previously published instruments used to assess HIV-related stigma (Table 1). For example, Cotler et al (2012)²⁰ constructed the HBV Stigma Instrument, which was developed utilizing previously published surveys of stigma in HIV^{41,42} and was subsequently used in two other studies identified in the current review.^{21,23} A further two studies, both conducted in China, used the same five questions to assess HBV-related stigma in rural adults or rural migrants to a major Chinese city.^{24,32} These questions related to the extent that a person was willing to interact, or let their children interact with someone living with chronic HBV. However, there is currently very limited evidence to support the psychometric properties (eg reliability and validity) of identified stigma instruments.

Stigma was consistently evident across studies conducted in people living with chronic HBV, with several studies showing that people often felt either embarrassed or ashamed, or that their HBV brought shame to their families (Table 1).^{20,21,23,27} For example, in Chinese or Vietnamese populations, or Chinese/Vietnamese immigrants to the US between 34% and 58% of the respondents believed that living with chronic HBV would bring trouble to their family.

Table 1 Summary of Included Quantitative Studies

Study (Setting)	Assessment Method	Participants	Key Findings
Carabez et al 2014 (US) ¹⁸	Anonymous, voluntary, custom-built, 29-item, online survey with two questionnaires (demographics and HBV knowledge) plus open-ended question on HBV-related concerns	N=154 Asian American adults (self-identified) with chronic HBV infection (60% US-born; 39% Chinese, 18% Japanese, 11% Korean, 7% Vietnamese, 6% Filipino, 5% Indian, 14% other)	HBV-related stigma a primary concern among 22% respondents Stigma-related issues identified included not being able to find a job, losing a job/missing work due to illness, isolation from social gatherings and friends
Cheng et al 2017 (US) ¹⁹	Custom-built survey assessing HBV vaccine status, knowledge and attitudes (based on previous studies in HBV, HCV and colon cancer screening)	N=404 Asians (self-identified; HBV infected and uninfected) (4% US-born, 63% Chinese, 36% Korean, 1% missing/other). Separate surveys in HBV screened and unscreened participants	% of patients, if infected with HBV who thought that they • Should avoid close contact with others: screened=65%, unscreened=52% • Might lose their job: screened=35% (approx.), unscreened=30% (approx.)
Cotler et al 2012 (US) ²⁰	Development and validation of the HBV Stigma Instrument (based on validated HIV stigma scales). Instrument assessed demographics, HBV knowledge and stigma (assessed across five domains)	N=201 Chinese immigrants including 11% chronically infected with HBV (country of origin: China=78%, Hong Kong=11%, Taiwan=1%, other Asian countries=5%, US=5%)	Mean (SD) stigma domain scores • Negative perception=1.95 (0.57) • Social isolation=1.92 (0.58) • Fear of contagion=2.70 (0.68) • Healthcare neglect=1.78 (0.63) • Workplace/school stigma=2.08 (0.67)
Dam et al 2016 (Vietnam and US) ²¹	HBV Stigma Instrument (Cotler et al 2012 ²⁰)	N=842 Vietnamese adults from Vietnam and n=170 Vietnamese adults in Chicago (HBV infected and uninfected)	% of patients who agreed/strongly agreed that people with HBV • Feel ashamed about having HBV: Chicago=29%, Vietnam=17% (p<0.001) • Should avoid close contact with others: Chicago=44%, Vietnam=43% (p=0.897) • Might be discriminated against at work in Vietnam: Chicago=29%, Vietnam=21% (0.023)
Drazic and Caltabiano 2013 (Australia) ²²	Modified version of Fife and Wright's Social Impact Scale, ⁵⁶ (a 20-item instrument, participants classified as either "high stigma" [≥ 10 "yes" answers] or "low stigma" group [≤ 9 yes answers]) used to assess stigma in chronic HBV versus chronic HCV patients	N=77 patients, n=20 chronic HBV and n=57 chronic HCV HBV patients: 50.0% Asian, 25.0% Caucasian, 5% indigenous Australian, 20.0% other ethnicity	Proportion of patients in high stigma group • Chronic HBV=35% • Chronic HCV=58% (p<0.05)
Huang et al 2016 (China) ²³	Assessment of HBV knowledge and stigma, based on Cotler et al 2012 ²⁰ and Li et al 2012 ²⁵ Stigma questionnaire contained 13 questions for HBV patients and 10 questions for non-HBV infected controls (higher score corresponded to higher level of stigma)	N=435 chronic HBV patients and n=801 uninfected controls	Proportion of HBV patients who believed that • HBV brought trouble to family=58% • They should avoid close contact with others=36% • They were not desirable as a spouse=33% • Had experienced discrimination from employers=19% • Put others at risk of HBV=52%

(Continued)

Table 1 (Continued).

Study (Setting)	Assessment Method	Participants	Key Findings
Leng et al 2016 (China) ²⁴	Custom-built, five question survey on HBV knowledge and discrimination against HBV patients; stigma/discrimination also measured on a scale of 0–10 (0 no discrimination, 10=highest discrimination)	N=903 rural adults aged >18 years who had moved to Beijing (HBV infected and uninfected)	Proportion of respondents unwilling to • Accept gifts from HBV patients/carriers=39.8% • Let their children play with HBV patients/carriers=64.7% • Have dinner with HBV patients/carriers=51.4% • Hug/shake hands with HBV patients/carriers=42.8%
Li et al 2012 (Canada) ²⁵	Toronto Chinese HBV Stigma Scale (20 item questionnaire, with responses on a 5-point Likert scale where 1=strongly agree, 5=strongly disagree, higher score [maximum of 100] indicates higher level of stigma)	N=343 self-identified Chinese individuals in Toronto (HBV infected and uninfected)	Mean (SD) HBV stigma score=54.6 (14.2)
Maxwell et al 2012 (US) ²⁶	Custom-built survey based on Health Behavior Framework factors including HBV awareness, routes of transmission, perceived susceptibility, perceived severity, doctor recommendation, stigma, and perceived efficacy of testing	N=1735 participants among four Asian American groups (Vietnamese n=653, Hmong n=260, Korean n=493, Cambodian n=329) (participants had never been tested for HBV)	% of respondents who agreed that people avoid other people with HBV • Vietnamese=38% • Hmong=55% • Korean=47% • Cambodian=70%
Mohamed et al 2012 (Malaysia) ²⁷	Custom-built, self-administered questionnaire developed based on literature review and research team consensus. HBV attitudes (eight items) assessed using a five-point Likert scale (1=strongly agree to 5=strongly disagree)	N=483 patients with chronic HBV (Chinese=73%, Malay=23%, Indian=3%, other ethnicity=2%)	% of patients who agreed or strongly agreed to • Worry of spreading HBV infection to family and friends=68.7% • Embarrassed to reveal HBV status=33.5% • HBV patients should not work in the food industry=33.5% • Did not inform doctors or dentists of HBV status before getting treatment=11.6%
Poorkaveh et al 2012 (Iran) ²⁸	Stigma assessed using the stigma subscale of the HBQOL questionnaire (Spiegel et al 2007 ²⁹) containing 31 items across six areas assessed on a five-point Likert-type scale, authors converted results to a 100-point score (lower score corresponds to lower quality of life)	N=320 chronic non-cirrhotic HBV patients aged >18 years	Mean (SD) stigma subscale scores according to • Diagnosis: recent=67.7 (24.0), past=76.4 (24.2) (p<0.05) • Educational level: less than diploma=72.4 (26.1), diploma and over=77.0 (23.3) (p=ns) • Co-morbid disease: no=74.4 (25.4), yes=75.1 (23.6) (p=ns)
Spiegel et al 2007 (US) ²⁹	Development and validation of a disease-targeted health-related quality of life instrument in noncirrhotic HBV: the Hepatitis B Quality of Life instrument, version 1.0 (HBQOLv1.0) containing 31 items across six areas (anticipation anxiety, stigma, psychological well-being, vitality, transmissibility and vulnerability)	N=138 patients with chronic HBV (78% of Asian descent)	Mean (SD) score for stigma domain: 70.5 (23.9)

(Continued)

Table 1 (Continued).

Study (Setting)	Assessment Method	Participants	Key Findings
Van der Veen et al 2014 (Netherlands) ³⁰	Custom-built, cross-sectional survey (postal questionnaire) with questions on demographics, history of HBV testing and vaccination (self-reported) and social-cognitive and socio-cultural determinants of screening, included questions on stigma and shame around HBV	N=335 Turkish-Dutch migrants (first and second generation) (HBV infected and non-infected)	Response to: if you had hepatitis B would other people avoid you? Think you were dirty? Still be friends with you? Have less respect for you? Feel uncomfortable being around you? (scale: not at all [-2] to very [2]) Mean (SD) score (overall)=-0.5 (1.1)
Wang et al 2009 (Taiwan) ³¹	Custom-built questionnaire to assess HBV knowledge, health beliefs and self-efficacy among different groups of students among different groups of students	N=328 students (n=109 immune with antiHBs, n=113 susceptible with no HBsAg or antiHBs, n=106 carriers with HBsAg)	Proportion of respondents agreeing that • If I were an HBV carrier I would be afraid to tell my friends: immune group=83.5%, susceptible group=76.6%, HBV carrier group=74.3% (p=0.54) • If my friend were an HBV carrier I would be afraid of getting HBV from him/her: immune group=83.5%, susceptible group=83.9%, HBV carrier group=76.2% (p=0.34)
Yu et al 2016 (China) ³²	Custom-built assessment of discrimination against HBV carriers in everyday life, based on five questions on willingness to interact with people infected with HBV	N=6538 rural adults (HBV infected and uninfected)	% of respondents willing to • Accept gifts from HBV patients/carriers=32.5% • Let their children play with HBV patients/carriers=21.6% • Have dinner with HBV patients/carriers=27.1% • Hug/shake hands with HBV patients/carriers=38.5%
Studies in Healthcare Professionals			
Acosta Gio et al 2008 (Costa Rica, Mexico, Venezuela) ³³	Assessment of dental students' attitudes towards treating patients with HBV or HIV infection and knowledge of infection control measures; assessed agreement/disagreement with statements using a Likert-like scale	N=96 dental students from Latin American countries	Proportion of students who "strongly" or "very strongly" objected to treating patients with HBV=<15%
Li et al 2007 (China) ³⁴	Comparison of HBV versus HIV-related stigma among HCPs in China based on two case vignettes (Kelly et al 1987 ⁵⁷) for patients with the same background and symptoms (one eventually diagnosed with HIV and the other with HBV, used a Likert-like scale from 1 (strongly disagree) to 5 (strongly agree)	N=1101 HCPs including doctors, nurses and lab technicians	Mean scores, patient is • Responsible for his illness: AIDS=3.32, HBV=2.63 (p<0.001) • Dangerous to other people: AIDS=3.09, HBV=2.48 (p<0.001) • Should be quarantined: AIDS=2.92, HBV=2.75 (p<0.001) • HCP would be willing to • Willing to continue friendship at this time: AIDS=3.78, HBV=4.11 (p<0.001) • Allow your children to visit: AIDS=3.00, HBV=3.40 (p<0.001)

Abbreviations: HBV, hepatitis B virus; HCP, healthcare professional; HCV, hepatitis C virus; HIV, human immunodeficiency virus.

Another consistent theme both from individuals living with chronic HBV or those without HBV was the feeling that people with HBV should avoid close contact (such as kissing or hugging) with others (Table 1).^{19–21,23,24,27,32} For example, in one study primarily in Chinese immigrants to the US, 62% of the respondents thought that they should avoid close contact with others.²⁰ Similarly, in a study of 404 individuals who self-identified as Asian Americans (in which 63% identified as Chinese and 36% as Korean and 94% were born outside the US), 65% of the respondents who had not been screened and 52% of the respondents who had been screened for HBV stated that if infected they would avoid close contact with others,¹⁹ and in a study in rural Chinese adults, only 39% would be willing to hug or shake hands with someone with HBV.³² A key driver of avoidance of close contact was fear of contagion, often driven by lack of knowledge. For example, 69% of a sample of Malaysian people living with HBV were worried about the possibility of transmitting HBV to others,²⁷ whilst in Vietnam, 55% of a general population sample erroneously believed that HBV could be transmitted through sharing cutlery with someone living with HBV.²¹

In terms of institutional stigma, one study showed that this was believed to be more common in China than in the US. In a study population consisting primarily of Chinese immigrants to the US, 8% of the respondents believed that they might be denied healthcare in the US, but 12% believed they might be denied healthcare in China.²⁰ Similarly, 21% of Vietnamese immigrants living in the US believed that having HBV might result in being refused healthcare in Vietnam.²¹ In terms of institutional stigma from employers, in one study from China 15% of people living with HBV felt that they had been denied employment opportunities owing to their HBV status.²³ Additionally, in a custom-built survey administered to self-identified Asian-Americans (of which 94% of the respondents were born outside the US and in terms of ethnicity 67% were Chinese, 31% Korean and 2% other/missing data), Cheng et al reported that 30–35% of the respondents believed that they would be at risk of losing their job if they were infected with HBV.¹⁹

Stigma directed towards people living with HBV was also consistently evident in studies conducted in general population samples where only a minority of respondents were living with chronic HBV.^{19,20,23–26,30,32} Some of the most extreme examples of stigma were reported in two studies among rural adults or rural immigrants to a major city in China, both of which assessed stigma using the same

series of five questions.^{24,32} In these two studies, 43% and 50% of the respondents, respectively, were unwilling to hug or shake hands with someone with HBV, 51% and 57% were unwilling to have dinner with someone with HBV and 78% and 82% of the respondents were unwilling to let their son/daughter marry someone with HBV.

Qualitative Studies

A total of six studies provided a qualitative assessment of patient or healthcare provider attitudes towards people living with HBV, including aspects of stigma and discrimination (Table 2).^{35–40} Two of the qualitative studies were conducted in people living with HBV in Malaysia and Iran.^{36,37} In Malaysia, people frequently reported feeling anxious and/or distressed following initial diagnosis, which was attributed to a combination or lack of knowledge, stigma around HBV, and physicians' emphasizing HBV-related complications. Respondents also noted that one of the consequences of stigma was an unwillingness to disclose their disease status beyond their immediate family members.³⁶ Similarly, in Iran, Valizadeh et al noted three main recurring themes in interviews with people living with HBV. These were a grief reaction following diagnosis, an inferiority complex and emotional challenges, which included worry, fear of stigma and deprivation, fear of being treated like an HIV patient and fear of losing employment or marriage opportunities.³⁷

Of the remaining four qualitative studies, three were conducted in the US^{35,39,40} and one was conducted in China.³⁸ Several consistent themes were noted in the US-based studies including the existence of HBV-related stigma and its negative impact on seeking testing as well as the relationship between stigma and lack of disease-related knowledge. Additionally, in one US study, conducted in African Americans in New York City, the authors noted that among immigrant communities, HBV is often overshadowed by HIV and often not considered to be as common and/or as serious as HIV.³⁵

The qualitative study from China compared attitudes and concerns among mothers of children living with chronic HBV with those of mothers of children without HBV. At the time at which the study was conducted, children with HBV were frequently precluded from enrolment in normal preschools/kindergartens in China. The primary concerns among mothers of children living with HBV were the fear of social discrimination and their child becoming ostracized if their HBV status became known. All mothers noted concern relating to the possibility of

Table 2 Summary of Qualitative Studies Examining HBV-Related Stigma

Study (Setting)	Assessment Method	Participants	Key Findings
Sripathan et al 2014 (US) ³⁵	Semi-structured in-depth interviews (using the PEN-3 model ¹⁸) to elicit culturally driven information on HBV knowledge, care seeking, barriers to screening and perceptions of healthcare	N=22 African Americans (HBV infected or uninfected, status not reported)	HBV overshadowed by HIV in African immigrant community Fear of being seen seeking care/screening for HBV Stigma around route of acquisition and association with HIV noted as barriers to screening
Ng et al 2013 (Malaysia) ³⁶	Total of nine qualitative focus group interviews to examine patient reactions and interactions with HCPs following diagnosis	N=44 newly diagnosed HBV patients	Disclosure of HBV status limited to immediate family, patients were unwilling to disclose HBV status to friends Anxiety/distress frequently followed diagnosis and was attributed to emphasis on complications, lack of knowledge and stigma related to HBV
Valizadeh et al 2016 (Iran) ³⁷	Unstructured, in depth qualitative interviews (30–105 mins duration)	N=18 patients with HBV	Three main themes identified: • Grief reaction following diagnosis • Emotional challenges, including fear of stigma, fear of being treated like an HIV patient, fear of losing a job or marriage opportunities • Inferiority complex, including social withdrawal, embarrassment and humiliation
Lai and Salili 1999 (China) ³⁸	Qualitative interviews in mothers of preschool children, included focus group discussions and interviews using questions from the Chinese Parenting Scale and the Chinese Children's Competence scale	N=90 mothers of preschool children (n=30 with children with HBV at a special health kindergarten, n=30 with children with HBV not attending any preschool/kindergarten and n=30 mothers of control non-HBV infected children)	Mothers of HBV children expressed concern about social discrimination and their child being ostracized once their HBV status was known All mothers were concerned over the possibility of HBV transmission if HBV-carrying children were integrated into normal schools
Blanas et al 2015 (US) ⁴⁰	Qualitative focus group interviews to assess perception of access to HBV screening and linkage to care in francophone West African immigrants (using an adaptation of the Andersen Model for Vulnerable Populations as a conceptual framework)	N=39 participants including community leaders, lay persons in the community, specifically including religious leaders, mutual aid organization representatives and former or current health worker	Awareness of horizontal transmission routes but lack of awareness of vertical and early childhood horizontal transmission postulated to contribute to stigma and discourage treatment seeking Noted that stigma and fear of disclosure reflected lack of knowledge rather than African cultural norms Participants noted that religious moral codes could contribute to HBV-related stigma
Studies in Healthcare Professionals			
Yang et al 2013 (US) ³⁹	Qualitative interviews among healthcare providers; conducted to address barriers to care in pregnant women with HBV in terms of prevention of perinatal transmission	N=33 HCPs for pregnant women including n=16 obstetricians and n=17 perinatal nurses	HCPs noted that patient stigma and apathy discouraged counselling and education of HBV patients Stigma influenced patients' willingness to discuss HBV, especially when accompanied by partners/relatives

Notes: ^aThe PEN-3 model for interviews covers three domains 1) cultural identity, 2) relationships and expectations and 3) cultural empowerment and was designed specifically to elicit culturally driven information and behaviours (Airhihenbuwa CO. Health promotion and disease prevention strategies for African Americans: a conceptual model. *Health Issues in the Black Community*. 1992;267–280).

Abbreviations: HBV, hepatitis B virus; HCP, healthcare provider; HIV, human immunodeficiency virus.

HBV transmission if children with HBV were integrated into mainstream schools.³⁸

Stigma from Healthcare Professionals

Two quantitative studies^{33,34} and one qualitative study³⁹ identified in the review examined HBV-related stigma and discrimination specifically among healthcare professionals (HCPs). The first quantitative study examined knowledge and discriminatory attitudes towards people living with HBV among dental students in three Latin American countries (Costa Rica, Mexico and Venezuela). Here, fewer than approximately 15% of the dental students stated that they “strongly” or “very strongly” objected to treating people with HBV.³³ Additionally, analysis of HBV knowledge revealed that only 26–43% dental students (depending on country) were aware that the risk of HBV transmission was higher than that for HIV.³³ The second quantitative study was conducted among HCPs in Yunnan province in China, including doctors, nurses and lab technicians, and used a 14-item questionnaire based on case vignettes to investigate and compare attitudes towards people living with HBV versus those living with HIV.³⁴ Overall, healthcare professionals believed that people living with chronic HBV should be treated with sympathy and understanding (mean score of 4.22 for the statement “deserves sympathy and understanding” where 1=strongly disagree and 5=strongly agree). However, when asked whether a person living with HBV should be considered as “dangerous to other people” the mean score was 2.48 (for people living with HIV the corresponding score was 3.09; $p<0.001$). Overall, HCPs exhibited a higher level of stigma towards people living with HIV than those living with HBV, with the authors reporting a significant difference in terms of HCP’s willingness to interact socially with people with HBV compared with those with HIV.³⁴ The authors suggest that, despite the higher infectivity of HBV relative to HIV, the higher level of HIV-related stigma may be driven by the perception of HIV being more life-threatening relative to HBV and a layered stigma effect for people living with HIV, wherein HIV was more strongly associated with other stigmatized behaviours including the use of injectable drugs and commercial sex work. Additionally, the authors also reported that both prejudicial attitudes and willingness to interact socially were significantly linked to medical education level.

Additionally, one qualitative study was conducted in HCPs caring for pregnant women in the US and examined barriers to care in terms of preventing perinatal

transmission of HBV.³⁹ The authors noted that stigma and apathy discourage education and counselling among people living with HBV and that stigma also had a negative influence on peoples willingness to discuss HBV, particularly when accompanied by partners or relatives.³⁹

Discussion

Overall findings of the review suggest that HBV-related stigma is best characterized in China, as well as in particular immigrant communities but that studies in North American, European and African HBV populations as well as comparative studies across different ethnic groups are lacking. This geographical bias is in line with the higher prevalence of HBV in Asia compared with North America and Europe. The WHO estimate that worldwide, 60% of people infected with HBV are resident in either Southeast Asia or the Western Pacific Region.⁴³ However, it should be noted that within both the WHO Southeast Asia and Western Pacific region the prevalence of HBsAg-positive individuals varies considerably between different countries (eg Schweitzer et al [2015] report HBsAg prevalence rates ranging from <1% for Nepal and Malaysia, but over 5% in several countries including Thailand, China and Vietnam⁴⁴). Consequently, even though on a regional level, the global burden of disease lies largely within Southeast Asia and the Western Pacific the clinical burden and social implications of HBV infection vary considerably for different countries within these regions.

Only one study from Europe was identified in the current review and this study assessed attitudes towards HBV in Turkish immigrants to the Netherlands. Although, even within Southeast Asia and the Western Pacific region, HBV-related stigma and the extent to which this influences the everyday lives of people living with HBV is not well studied, although to date, stigma around HBV is best characterized in the Chinese setting. Evidence from published literature suggests that HBV-related stigma is both particularly pronounced and deeply entrenched within Chinese society, especially amongst those in rural areas and/or with lower socioeconomic status.^{24,32}

Several studies included in the review sought to establish the underlying causes of stigma directed toward HBV. Although vertical transmission was a key transmission route for a large proportion of the prevalent population, it has been suggested that in China, a substantial proportion of HBV-related stigma may be attributable to a legacy of fear, misconception and poor understanding of HBV

transmission routes following a major outbreak of hepatitis A in Shanghai in 1988.^{6,7} The seriousness of the hepatitis A outbreak, combined with a lack of knowledge of viral hepatitis, in particular around routes of transmission may have provided the basis for much of the structural, as well as social and internalized stigma that has been reported in China. The basis for structural stigma in particular was further perpetuated by legislation that permitted employers and universities to screen applicants for HBV and reject them on the basis of a positive HBV test result.⁷ Pre-employment HBV screening was officially banned in 2010 but, despite several high profile lawsuits, is still widespread.⁶ Employers or educational establishments can also effectively work around such legislation by asking applicants to sign a voluntary agreement for an HBV test, or by testing the liver function of applicants.^{45,46}

Other key underlying reasons for stigma included fear of infection, as well as negative assumptions and stereotyping around the sources of infection, with HBV transmission in adults often being perceived as being associated with the use of injectable drugs, sexual promiscuity or homosexuality. Further, research in HIV suggests that already marginalized populations such as PWIDs experience a higher level of stigma if infected with HIV owing to an “intersectional” or “layered” stigma effect⁴⁷; however, studies examining whether this is also the case with HBV are lacking. Fear of infection was consistently noted as a key concern, both among people living with chronic HBV and among the general population. In particular, the fear of infecting close family was consistently noted as a major issue among those living with chronic HBV.^{18–20,23,27} Allied to this, a general unwillingness to engage in close physical contact, such as kissing or hugging, people living with HBV was also noted,^{21,23,24,32} which was often partly attributed to a lack of knowledge around routes of transmission. For example, in one study conducted in Beijing, 58% of the respondents thought that people with HBV should not be allowed to work in restaurants, which is likely related to the fact that 73% of the respondents believed that HBV could be spread by sharing food or utensils.²³ However, the relationship between HBV knowledge and stigma appears to be both complex and inconsistent, with some investigators noting that in order to fully elucidate the relationship between HBV knowledge and stigma it may be important to delineate between total HBV knowledge and know specifically relating to transmission routes.^{20,23} Notably, two studies noted a stronger association between stigma and knowledge of transmission routes than to overall knowledge.^{20,23}

Two studies examined the influence of vaccination on HBV-related stigma.^{24,32} In one study in rural Chinese adults, vaccination was associated with lower levels of stigma, which the authors postulated was due to “a stronger sense of security” owing to being protected against HBV infection.³² In contrast, another study from China reported that a severe level of HBV-related stigma was more common among vaccinated compared with unvaccinated individuals (52% versus 44%), which the authors hypothesized was due to vaccinated individuals being more knowledgeable about the potential clinical consequences of chronic HBV.²⁴ On a related note, one hypothetical issue that has not been examined in published literature to date is whether stigma, particularly that emanating from fear of contagion, would be influenced by the availability of curative treatments. A key difference between HBV and HIV and hepatitis C is the availability of curative treatments. Replication of HIV and HBV can be suppressed, but as yet, neither HBV or HIV can be eradicated, whereas in contrast, HCV is now curable for almost all people with chronic HCV.⁴⁸ A recent study in men who have sex with men (MSM) who were living with HIV and resident in China reported that many men believed that if a cure was available for HIV it would reduce the stigma around HIV. In this study, respondents were reported to experience layered stigma owing to negative attitudes towards both MSM and HIV and that a cure for HIV would only combat stigma related to HIV and not MSM.⁴⁹ However, data relating to whether the availability of a curative treatment would influence HBV-related stigma are currently lacking.

Another area where a paucity of data was noted was related to patient perceptions of HCPs who were living with chronic HBV. A small number of studies examined the perception of treating patients with chronic HBV by HCPs^{33,34} but despite the higher risk for iatrogenic transmission of HBV compared with HIV the issue of disclosure and attitudes towards HCPs living with chronic HBV remains poorly characterized. The rate of HBV transmission from an HCP with HBV to a patient is 240–2400 per million procedures compared with 2.4–24 per million procedures for an HCP with HIV⁵⁰ and in the US, up to 1994, a total of 375 people are reported to have acquired HBV from HCPs.⁵¹ Disclosure practices among HCPs in particular are subject to considerable debate around ethics and privacy.⁵⁰ US guidelines state that every case should be considered on an individual basis.⁵¹ However, it has been documented that in some settings,

such as Canada, medical students living with chronic HBV are encouraged to specialize in areas such as psychiatry with minimal exposure-prone procedures.⁵²

One theme that has been consistently noted among immigrant communities, both for HBV and HIV, is that the close-knit nature of such communities and the fear of being recognized at a clinic or hospital by other people or even HCPs from within that community often served as a barrier to testing and treatment-seeking.^{35,53} For HBV, the clinical implications of delaying or avoiding testing or treatment-seeking include the potential for onward transmission for people who remain undiagnosed and the potential for the disease progression in those who do not seek treatment. In settings such as North America for example, where horizontal transmission of bloodborne viruses is more common, this barrier is further compounded by a broader overarching stigma directed towards infections that can be transmitted sexually.⁵⁴ Indeed, Lichtenstein (2003) noted that in the southern US there is often a perception that people with a sexually transmitted infection (STI) have acquired it through “immoral sexual acts”, and also that “the role of gossip in perpetuating STI-related stigma cannot be overstated”.⁵⁴ Recently, public health initiatives such as the San Francisco Hep B Free Campaign, which began in 2007 and was specifically targeted at Asian Americans, have sought to reposition HBV from a taboo subject to a preventable and treatable condition.⁵⁵

A limitation of the current review is that owing to the heterogeneity of different studies included and the inherent difficulty in characterizing and quantifying stigma no formal assessment of study quality was performed. However, overall the instruments/questionnaires used to assess stigma appeared to be well suited to purpose and were typically performed using validated questionnaires or used previously validated questionnaires as a framework for custom-built questionnaires. Additionally, most studies used relatively large sample groups, with only two quantitative studies utilizing sample groups of under 100 respondents.^{22,33} A further limitation was that the review was limited to articles published in English, and therefore does not capture any articles characterizing stigma published in non-English language journals.

Conclusions

In summary, the findings of the current review show that HBV-related stigma is common in several Asian countries, particularly China, and within immigrant communities from

China, South Korea, and Vietnam in North America, but has not been extensively documented in European, North American, African or other populations. Moreover, it may not be possible to generalize the findings from settings such as China to other countries or regions owing to the substantial social and cultural differences that exist, as well as the fact that in regions such as Europe and North America, HBV is primarily transmitted through horizontal routes, whereas vertical transmission from mother to infant is key transmission route in countries such as China. HBV-related stigma can negatively influence many aspects of everyday life for people living with HBV and key causes of stigma include misconceptions around routes of transmission and fear of infection. Further, in many countries there remains an unmet need for public health and awareness initiatives aimed at overcoming HBV-related stigma and the barrier it presents to accessing testing and treatment.

Abbreviations

HBeAg, hepatitis B envelope antigen; HBV, hepatitis B virus; HCP, healthcare professional; HCV, hepatitis C virus; HIV, human immunodeficiency virus; IDU, intravenous drug user; MeSH, medical subject heading; MSM, men who have sex with men; STI, sexually transmitted infection; WHO, World Health Organization.

Acknowledgments

The abstract of this paper and summary findings were presented at the European Association for the Study of the Liver (EASL) International Liver Congress in April 2018. The abstract for the poster was published in the *Journal of Hepatology* 2018; 68 (Suppl 1) pS185.

Author Contributions

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

Funding

This study was supported by funding from Janssen Pharmaceutica NV.

Disclosure

KB, KC, US and EC are current employees of Janssen, which provided funding for this manuscript. JSP, WV and

RP are current or former employees of Ossian Health Economics and Communications, which has received consulting fees from Janssen Pharmaceutica NV.

References

- Mahajan AP, Sayles JN, Patel VA, et al. Stigma in the HIV/AIDS epidemic: a review of the literature and recommendations for the way forward. *AIDS*. 2008;22 Suppl 2:S67–S79. doi:10.1097/01.aids.0000327438.13291.62
- Polaris Observatory Collaborators. Global prevalence, treatment, and prevention of hepatitis B virus infection in 2016: a modelling study. *Lancet Gastroenterol Hepatol*. 2018;3(6):383–403. doi:10.1016/S2468-1253(18)30056-6
- World Health Organization. HIV/AIDS fact sheet. Available from: <http://www.who.int/news-room/fact-sheets/detail/hiv-aids>. Accessed May 14, 2018.
- World Hepatitis Alliance. Viral hepatitis kills more people than HIV, malaria or tuberculosis. Available from: <http://www.worldhepatitisalliance.org/news/sep-2017/viral-hepatitis-kills-more-people-hiv-malaria-or-tuberculosis>. Accessed May 15, 2018.
- Scambler G. Health-related stigma. *Sociol Health Illn*. 2009;31:441–455. doi:10.1111/shil.2009.31.issue-3
- Liu K. Hepatitis B infection in China: the stigma behind the stigmata. *Liver Int*. 2016;36:1582–1584. doi:10.1111/liv.2016.36.issue-11
- Understanding and challenging employment discrimination against people living with HBV in China. Beijing: Yirenping Centre; 2010. Available from: http://www.clb.org.hk/sites/default/files/archive/en/share/File/research_reports/HBV_report_final.pdf. Accessed January 02, 2020.
- China Daily. Discrimination in the job market common: survey. Liu Weifeng for China Daily; 2007. Available from: http://www.chinadaily.com.cn/china/2007-06/14/content_893811.htm. Accessed April 24, 2017.
- Rice WS, Logie CH, Napoles TM, et al. Perceptions of intersectional stigma among diverse women living with HIV in the United States. *Soc Sci Med*. 2018;208:9–17. doi:10.1016/j.socscimed.2018.05.001
- Logie CH, James L, Tharao W, Loutfy MR. HIV, gender, race, sexual orientation, and sex work: a qualitative study of intersectional stigma experienced by HIV-positive women in Ontario, Canada. *PLoS Med*. 2011;8(11):e1001124.
- Chen HL, Chang MH, Ni YH, et al. Seroepidemiology of hepatitis B virus infection in children: ten years of mass vaccination in Taiwan. *JAMA*. 1996;276(11):906–908. doi:10.1001/jama.1996.03540110060032
- Lok AS. Hepatitis B. 50 years after the discovery of Australia antigen. *J Viral Hepat*. 2016;23(1):5–14. doi:10.1111/jvh.12444
- World Hepatitis Alliance. Holding Governments Accountable. Available from: http://www.worldhepatitisalliance.org/sites/default/files/resources/documents/holding_governments_accountable_-_civil_society_survey_report.pdf. Accessed May 15, 2018.
- World Health Organization. Global health sector strategy on viral hepatitis 2016–2022. Available from: <http://apps.who.int/iris/bitstream/handle/10665/246177/WHO-HIV-2016.06-eng.pdf;jsessionid=16A028EBC622CBF5B5E3903DD6365BFC?sequence=1>. Accessed May 15, 2018.
- World Health Organization. Global hepatitis report; 2017. Available from: <http://apps.who.int/iris/bitstream/handle/10665/255016/9789241565455-eng.pdf?sequence=1>. Accessed May 15, 2018.
- Wallace J, Pitts M, Chaojie GL, et al. Needs assessment of people with viral hepatitis – China. July 2015. Available from: https://www.latrobe.edu.au/_data/assets/pdf_file/0006/649302/China-Needs-Assessment-English.pdf. Accessed May 15, 2018.
- Covalence Research Ltd. Sourcerer. London, UK; 2018. Available from: <https://sourcerer.pro/>. Accessed May 15, 2018.
- Carabez RM, Swanner JA, Yoo GJ, Ho M. Knowledge and fears among Asian Americans chronically infected with hepatitis B. *J Cancer Educ*. 2014;29:522–528. doi:10.1007/s13187-013-0585-7
- Cheng S, Li E, Lok AS. Predictors and barriers to hepatitis B screening in a midwest suburban Asian population. *J Community Health*. 2017;42:533–543. doi:10.1007/s10900-016-0285-4
- Cotler SJ, Cotler S, Xie H, Luc BJ, Layden TJ, Wong SS. Characterizing hepatitis B stigma in Chinese immigrants. *J Viral Hepat*. 2012;19:147–152. doi:10.1111/j.1365-2893.2011.01462.x
- Dam L, Cheng A, Tran P, et al. Hepatitis B stigma and knowledge among vietnamese in Ho Chi Minh City and Chicago. *Can J Gastroenterol Hepatol*. 2016;2016:1910292. doi:10.1155/2016/1910292
- Drazic YN, Caltabiano ML. Chronic hepatitis B and C: exploring perceived stigma, disease information, and health-related quality of life. *Nurs Health Sci*. 2013;15:172–178. doi:10.1111/nhs.2013.15.issue-2
- Huang J, Guan ML, Balch J, et al. Survey of hepatitis B knowledge and stigma among chronically infected patients and uninfected persons in Beijing, China. *Liver Int*. 2016;36:1595–1603. doi:10.1111/liv.2016.36.issue-11
- Leng A, Li Y, Wangen KR, Nicholas S, Maitland E, Wang J. Hepatitis B discrimination in everyday life by rural migrant workers in Beijing. *Hum Vaccin Immunother*. 2016;12:1164–1171. doi:10.1080/21645515.2015.1131883
- Li D, Tang T, Patterson M, Ho M, Heathcote J, Shah H. The impact of hepatitis B knowledge and stigma on screening in Canadian Chinese persons. *Can J Gastroenterol*. 2012;26:597–602. doi:10.1155/2012/705094
- Maxwell AE, Stewart SL, Glenn BA, et al. Theoretically informed correlates of hepatitis B knowledge among four Asian groups: the health behavior framework. *Asian Pac J Cancer Prev*. 2012;13:1687–1692. doi:10.7314/APJCP.2012.13.4.1687
- Mohamed R, Ng CJ, Tong WT, Abidin SZ, Wong LP, Low WY. Knowledge, attitudes and practices among people with chronic hepatitis B attending a hepatology clinic in Malaysia: a cross sectional study. *BMC Public Health*. 2012;12:601. doi:10.1186/1471-2458-12-601
- Poorkaveh A, Modabbernia A, Ashrafi M, et al. Validity, reliability and factor structure of hepatitis B quality of life questionnaire version 1.0: findings in a large sample of 320 patients. *Arch Iran Med*. 2012;15:290–297. doi:10.12155/AIM.009
- Spiegel BM, Bolus R, Han S, et al. Development and validation of a disease-targeted quality of life instrument in chronic hepatitis B: the hepatitis B quality of life instrument, version 1.0. *Hepatology*. 2007;46:113–121. doi:10.1002/hep.21692
- van der Veen YJ, van Empelen P, Looman CW, Richardus JH. Social-cognitive and socio-cultural predictors of hepatitis B virus-screening in Turkish migrants, the Netherlands. *J Immigr Minor Health*. 2014;16:811–821. doi:10.1007/s10903-013-9872-y
- Wang WL, Wang CJ, Tseng HF. Comparing knowledge, health beliefs, and self-efficacy toward hepatitis B prevention among university students with different hepatitis B virus infectious statuses. *J Nurs Res*. 2009;17:10–19. doi:10.1097/JNR.0b013e3181999ca3
- Yu L, Wang J, Zhu D, Leng A, Wangen KR. Hepatitis B-related knowledge and vaccination in association with discrimination against Hepatitis B in rural China. *Hum Vaccin Immunother*. 2016;12:70–76. doi:10.1080/21645515.2015.1069932
- Acosta-Gio AE, Borges-Yáñez SA, Flores M, et al. Infection control attitudes and perceptions among dental students in Latin America: implications for dental education. *Int Dent J*. 2008;58:187–193. doi:10.1111/j.1875-595X.2008.tb00347.x
- Li L, Wu Z, Zhao Y, Lin C, Detels R, Wu S. Using case vignettes to measure HIV-related stigma among health professionals in China. *Int J Epidemiol*. 2007;36:178–184. doi:10.1093/ije/dyl256
- Sripthanlop P, Jandorf L, Kairouz C, Thelemaque L, Shankar H, Perumalswami P. Factors related to hepatitis B screening among Africans in New York City. *Am J Health Behav*. 2014;38:745–754. doi:10.5993/AJHB.38.5.12

36. Ng CJ, Low WY, Wong LP, Sudin MR, Mohamed R. Uncovering the experiences and needs of patients with chronic hepatitis B infection at diagnosis: a qualitative study. *Asia Pac J Public Health*. 2013;25:32–40. doi:10.1177/1010539511413258
37. Valizadeh L, Zamanzadeh V, Negarandeh R, Zamani F, Hamidia A, Zabihi A. Psychological reactions among patients with chronic hepatitis B: a qualitative study. *J Caring Sci*. 2016;5:57–66. doi:10.15171/jcs.2016.006
38. Lai AC, Salili F. Parental attitudes toward their parenting styles and children's competence in families whose children are hepatitis B virus (HBV) carriers in Guangzhou China. *J Comp Fam Stud*. 1999;30:281–295. doi:10.3138/jcfs.30.2.281
39. Yang EJ, Cheung CM, So SK, Chang ET, Chao SD. Education and counseling of pregnant patients with chronic hepatitis B: perspectives from obstetricians and perinatal nurses in Santa Clara County, California. *Asian Pac J Cancer Prev*. 2013;14:1707–1713. doi:10.7314/APJCP.2013.14.3.1707
40. Blanas DA, Nichols K, Bekele M, et al. Adapting the Andersen model to a francophone West African immigrant population: hepatitis B screening and linkage to care in New York City. *J Community Health*. 2015;40:175–184. doi:10.1007/s10900-014-9916-9
41. Holzemer WL, Uys LR, Chirwa ML, et al. Validation of the HIV/AIDS Stigma Instrument - PLWA (HASI-P). *AIDS Care*. 2007;19:1002–1012. doi:10.1080/09540120701245999
42. Kalichman SC, Simbayi LC, Jooste S, et al. Development of a brief scale to measure AIDS-related stigma in South Africa. *AIDS Behav*. 2005;9:135–143. doi:10.1007/s10461-005-3895-x
43. World Health Organization. 2017. Available from: <http://www.who.int/hepatitis/en/>. Accessed April 24, 2017.
44. Schweitzer A, Horn J, Mikolajczyk RT, Krause G, Ott JJ. Estimations of worldwide prevalence of chronic hepatitis B virus infection: a systematic review of data published between 1965 and 2013. *Lancet*. 2015;386(10003):1546–1555. doi:10.1016/S0140-6736(15)61412-X
45. Yang T, Wu MC. Discrimination against hepatitis B carriers in China. *Lancet*. 2011;378(9796):1059. doi:10.1016/S0140-6736(11)61460-8
46. Wallace J, Pitts M, Liu C, et al. More than a virus: a qualitative study of the social implications of hepatitis B infection in China. *Int J Equity Health*. 2017;16(1):137. doi:10.1186/s12939-017-0637-4
47. Morris JL, Lippman SA, Philip S, Bernstein K, Neillands TB, Lightfoot M. Sexually transmitted infection related stigma and shame among African American male youth: implications for testing practices, partner notification, and treatment. *AIDS Patient Care STDS*. 2014;28:499–506. doi:10.1089/apc.2013.0316
48. Bartenschlager R, Baumert TF, Bukh J, et al. Critical challenges and emerging opportunities in hepatitis C virus research in an era of potent antiviral therapy: considerations for scientists and funding agencies. *Virus Res*. 2018;248:53–62. doi:10.1016/j.virusres.2018.02.016
49. Wu F, Zhang A, Babbitt A, et al. Overcoming HIV stigma? A qualitative analysis of HIV cure research and stigma among men who have sex with men living with HIV. *Arch Sex Behav*. 2017. doi:10.1007/s10508-017-1062-x
50. Barrigar DL, Flagel DC, Upshur RE. Hepatitis B virus infected physicians and disclosure of transmission risks to patients: a critical analysis. *BMC Med Ethics*. 2001;2:E4. doi:10.1186/1472-6939-2-4
51. Henderson DK, Dembry L, Fishman NO, et al; Society for Healthcare Epidemiology of America. SHEA guideline for management of healthcare workers who are infected with hepatitis B virus, hepatitis C virus, and/or human immunodeficiency virus. *Infect Control Hosp Epidemiol*. 2010;31:203–232. doi:10.1086/650298
52. Colistro R. Hepatitis B and medical students. *CMAJ*. 2000;163:259–260.
53. Russ LW, Meyer AC, Takahashi LM, et al. Examining barriers to care: provider and client perspectives on the stigmatization of HIV-positive Asian Americans with and without viral hepatitis co-infection. *AIDS Care*. 2012;24:1302–1307. doi:10.1080/09540121.2012.658756
54. Lichtenstein B. Stigma as a barrier to treatment of sexually transmitted infection in the American deep south: issues of race, gender and poverty. *Soc Sci Med*. 2003;57:2435–2445. doi:10.1016/j.socscimed.2003.08.002
55. Yoo GJ, Fang T, Zola J, Dariotis WM. Destigmatizing hepatitis B in the Asian American community: lessons learned from the San Francisco Hep B Free Campaign. *J Cancer Educ*. 2012;27:138–144. doi:10.1007/s13187-011-0252-9
56. Fife B, Wright E. The dimensionality of stigma: a comparison of its impact on the self of persons with HIV/AIDS and cancer. *J Health Soc Behav*. 2000;41:50–67. doi:10.2307/2676360
57. Kelly JA, St Lawrence JS, Smith S, Hood HV, Cook DJ. Stigmatization of AIDS patients by physicians. *Am J Public Health*. 1987;77:789–791. doi:10.2105/AJPH.77.7.789

Patient Related Outcome Measures

Publish your work in this journal

Patient Related Outcome Measures is an international, peer-reviewed, open access journal focusing on treatment outcomes specifically relevant to patients. All aspects of patient care are addressed within the journal and practitioners from all disciplines are invited to submit their work as well as healthcare researchers and patient support groups.

Submit your manuscript here: <http://www.dovepress.com/patient-related-outcome-measures-journal>

Dovepress

The manuscript management system is completely online and includes a very quick and fair peer-review system. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.