SYSTEMATIC REVIEW
A blind spot? Confronting the stigma of hepatitis B virus (HBV) infection - A systematic review [version 1; referees: awaiting peer review]

Jolynne Mokaya, Anna L McNaughton, Lela Burbridge, Tongai Maponga, Geraldine O'Hara, Monique Andersson, Janet Seeley, Philippa C Matthews

1Nuffield Department of Medicine, University of Oxford, Peter Medawar Building for Pathogen Research, South Parks Road, Oxford, OX1 3SY, UK
2Department of Gastroenterology, Oxford University Hospitals NHS Foundation Trust, Oxford, UK
3Department of Virology, University of Stellenbosch, Tygerberg Hospital, Bellville, Cape Town, 7500, South Africa
4Faculty of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT, UK
5Department of Infectious Diseases and Microbiology, Oxford University Hospitals NHS Foundation Trust, John Radcliffe Hospital, Headley Way, Oxford, OX1 3SY, UK
6Department of Global Health and Development, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT, UK
7Medical Research Council/Uganda Virus Research Institute and London School of Hygiene and Tropical Medicine, Uganda Research Unit, 51/59 Nakiwogo Rd, Entebbe, Uganda

Abstract
Background: The Global Hepatitis Health Sector Strategy is aiming for the elimination of viral hepatitis as a public health threat by 2030. Successful diagnostic, treatment and preventive strategies can reduce incidence and morbidity; it is important to ensure that these interventions and services are not only available, but also accessible. Stigma, poverty, and lack of knowledge may present a substantial barrier, especially in resource limited settings. We therefore set out to assimilate evidence for the nature and impact of stigma on the lives of people with HBV infection and on the community, and to suggest ways to tackle stigma and discrimination.

Methods: We carried out a literature search in PubMed using the search terms ‘hepatitis B’, ‘stigma’ to identify relevant papers published between 2007 and 2017 (inclusive), with a particular focus on Africa.

Results: We identified a total of 34 articles, of which only one study was conducted in Africa. Lack of knowledge on HBV was consistently identified: there were misconceptions about HBV transmission among the public, healthcare workers (HCWs) provided inaccurate information to individuals diagnosed with HBV, and poor understanding resulted in lack of preventive precautions. Stigma negatively impacted on health behaviour such as help-seeking, screening, disclosure, prevention of transmission, and adherence to treatment.

Conclusion: Stigma is a potentially major barrier to the successful implementation of preventive, diagnostic and treatment strategies for HBV infection, and yet there is very limited recognition of the magnitude of this challenge, especially in Africa. There is a need for more research in this area, to...
identify and evaluate interventions that can be used effectively to tackle stigma in HBV, and to inform collaborative efforts between policy makers, HCWs, traditional healers, religious leaders, charity organisations and support groups, to improve awareness and tackle stigma in HBV in Africa.

Corresponding author: Philippa C Matthews (philippa.matthews@ndm.ox.ac.uk)

Author roles: Mokaya J: Conceptualization, Data Curation, Formal Analysis, Methodology, Writing – Original Draft Preparation, Writing – Review & Editing; McNaughton AL: Investigation, Writing – Review & Editing; Burbridge L: Conceptualization, Resources, Writing – Review & Editing; Maponga T: Resources, Writing – Review & Editing; O’Hara G: Conceptualization, Writing – Review & Editing; Andersson M: Conceptualization, Supervision, Writing – Review & Editing; Seeley J: Conceptualization, Methodology, Supervision, Writing – Review & Editing; Matthews PC: Conceptualization, Investigation, Project Administration, Supervision, Writing – Original Draft Preparation, Writing – Review & Editing

Competing interests: No competing interests were disclosed.


Copyright: © 2018 Mokaya J et al. This is an open access article distributed under the terms of the Creative Commons Attribution Licence, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Grant information: JM is funded by a Leverhulme Mandela Rhodes Scholarship. PCM is funded by the Wellcome Trust (grant ref. 110110). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Abbreviations
- PMTCT – Prevention of mother to child transmission
- TB – Tuberculosis
- HBV – Hepatitis B virus
- HCC – Hepatocellular carcinoma
- WHO – World Health Organisation
- HIV/AIDS – Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
- HCWs – Healthcare workers
- THs – Traditional healers
- CHB – Chronic Hepatitis B

Introduction
Hepatitis B virus (HBV) infection has been reported worldwide, with an estimated burden of 250 million cases, and has been associated with high mortality rates resulting from complications including cirrhosis and hepatocellular carcinoma (HCC)\(^3\). There are effective prevention and treatment strategies available, including vaccination and suppressive antiviral therapy, both of which also contribute to prevention of vertical transmission\(^3\). The Global Hepatitis Health Sector Strategy is aiming for the elimination of viral hepatitis as a public health threat by 2030\(^1\). However, there are important challenges still to be addressed including gaps in vaccine coverage\(^4,14\), limited access to diagnostic tests and treatment\(^1\) and lack of a curative therapy\(^2,24\). Stigma, poverty, and lack of knowledge add further to the challenge, especially in resource-limited settings\(^5\). There is a growing body of personal testimonies providing evidence of stigma associated with HBV\(^6,6\). However, there is a very limited literature to describe this, and more work is required to understand the nature and impact of stigma for individuals with HBV infection.

Individuals who are stigmatised as a result of illness or infection not only have to bear potential challenges to health, but may also be denied the opportunities that define quality of life such as education, employment, access to appropriate health care and interaction with a diverse cross-section of society\(^7\). Although many diseases are stigmatised, awareness of – and investigation into – stigma is better represented in some areas than others. In HIV, stigma has been shown to limit engagement with services including screening and prevention of mother to child transmission (PMTCT), and uptake of antiretroviral therapy\(^8,11\); in tuberculosis (TB) it has been shown to cause diagnostic delays and treatment non-compliance\(^2,21\), and in mental illness, stigma has been associated with delays in help-seeking, discontinuation of treatment, suboptimal therapeutic relationships, patient safety concerns, and poorer quality mental and physical care\(^14,16\).

Stereotypes and prejudice may stem from physical differences attributable to the condition, misconceptions associated with fear of contagion, and judgements about routes of transmission, all of which may be underpinned by lack of knowledge\(^7,10\). Beyond the physical manifestations and potential complications of an illness, stigma usually arises from lack of awareness, lack of education and lack of perception\(^10\). People living with HIV/AIDS, especially those displaying wasting syndrome and certain identifiable opportunistic infections are more prone to stigma compared to those who are asymptomatic\(^4\). HIV and TB may be stigmatised as a result of anxieties about spread of infection, and may also be regarded as a punishment for ‘irresponsible’ or ‘immoral’ behaviour\(^3,21–23\). People with mental illnesses may be considered ‘dangerous’ or provoke fear, may lose their autonomy, or be treated as ‘childlike’\(^1\). Understanding why society reacts in a particular way is one way to address stigma\(^8\), and could therefore help to guide approaches to tackling stigma in HBV.

HBV is highly endemic in Africa, a continent that faces huge challenges in prevention, diagnosis and treatment\(^1\). The situation is further complicated by the substantial public health challenge of co-endemic HIV and HBV\(^19\). An understanding of the breadth and scope of stigma in HBV, especially in Africa, is an essential part of any strategy that seeks to tackle and eventually eliminate HBV infection as a public health problem. As the improvement of universal availability and accessibility of diagnostic, treatment and vaccination options are underway, it is important to ensure that products and services are not only available, but also accessible; people with HBV infection must be able to access education, clinical care, and support from their partners and families, healthcare workers, and members of their communities. Also, the WHO recommends HBV treatment in an environment that minimizes stigma and discrimination\(^25\).

We therefore set out to assimilate evidence for the nature and impact of stigma on the lives of people with HBV infection and on the community, to describe coping strategies employed by people with HBV, and to suggest ways to tackle stigma and discrimination.

Methods
Search strategy
In November-December 2017, we undertook a literature search in PubMed; our search strategy is detailed in Supplementary file 1. We carried out two searches: the first search focused on stigma in HBV in Africa; and a second search which was not limited to Africa. These searches yielded 50 and 879 articles, respectively. 49 articles were duplicates. On reviewing the titles and abstracts, 827 were excluded from search results as they were not on stigma or HBV. Full texts of 53 articles were reviewed and 19 were excluded (3 were reviews, 3 were reports, 1 was not available, and 12 did not report on stigma). A total of 34 articles were therefore downloaded in full (Supplementary file 3). From each publication, we extracted: citation, study design, sample size, study population, country, factors associated with stigma, impact of stigma on the lives of people with HBV, and proposed interventions to tackle stigma in the society. Data were curated using MS Excel software (Microsoft, Redmond, WA). Ethics approval was not required for this study.

Results
The full metadata generated from our literature search are available in Supplementary file 2.
Factors associated with creating or perpetuating stigma for individuals with HBV infection

Some of the common themes identified from literature that are associated with stigma and HBV are summarised in Table 1.

Lack of knowledge is a central theme in perpetuation of stigma. This applies to education among individuals with the infection, but also their families, society and health care workers (HCW). Failure of HCWs to provide adequate and accurate information may be a barrier to treatment, reduce the likelihood of disclosure to family, and contribute to fear, anxiety and depression which in turn negatively impact on coping strategies\(^{36}\). Lack of knowledge may also be a reason why some HCWs are not themselves vaccinated against HBV and therefore are at an increased risk of acquiring HBV. A study carried out in Cameroon reported a HBV vaccination rate of only 12% among HCW\(^{37}\), and a study in Nigeria reported a 25% prevalence of HBV infection among surgeons\(^{26}\). Lack of awareness among policy makers negatively impacts on appropriate prioritisation, and this can be an important contributor to poor advocacy, inadequate allocation of resources\(^{37}\) and poor levels of education.

Given that HBV is not well understood in some communities, it may be considered a punishment or linked to ‘evil spirits’\(^{26,30,31}\). Some individuals may therefore opt to seek assistance from traditional healers (THs) or faith leaders, seeking ‘purification’. Although THs and religious healers can have an important role in providing psychosocial support, there is also the potential for harm and/or delaying presentation to clinical care\(^{12,33}\). A recent report showed that in Africa, HCC presents at a late stage, where effective treatment would be challenging for any healthcare system\(^{34}\). Specialised training on HBV for THs and ministers of faith, and healthcare programs that work collaboratively with these groups, could be a valuable approach in some settings\(^{35}\).

Although stigma has also been associated with old age and following of traditional values\(^ {16}\), this may primarily reflect lack of knowledge or exposure, while younger people tend to have more access to information, and are less defined by traditional values\(^{16,37}\). However, this relationship is not consistent, as one study found an association between old age and decreased prejudice in HBV infection\(^ {47}\). It is important to pay special consideration to specific groups of people who might be most vulnerable to the effects of stigma when designing interventions.

Stigma affects various aspects of everyday lives of people with HBV infection (Table 2). Similar to mental disorders and HIV/AIDS, stigma in HBV can negatively impact on health behaviour such as help-seeking, screening, disclosure, prevention of transmission, access and adherence to treatment, and poorer quality mental and physical care\(^{1,4,20}\).

<table>
<thead>
<tr>
<th>Table 1. Factors underpinning stigma in HBV infection, identified from a literature review.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lack of knowledge or awareness</strong></td>
</tr>
<tr>
<td>Lack of knowledge among the public was represented by:</td>
</tr>
<tr>
<td>• Misconceptions that HBV can be transmitted through sharing of utensils, via food or eating together(^ {22,45});</td>
</tr>
<tr>
<td>• Beliefs that HBV is a genetic trait(^ {17});</td>
</tr>
<tr>
<td>• Lack of awareness that HBV could be transmitted sexually(^ {17});</td>
</tr>
<tr>
<td>• Representation of HBV as a consequence of bad behaviour, or perception of individuals with HBV as ‘bad people’(^ {31}).</td>
</tr>
<tr>
<td>Lack of knowledge among healthcare workers (HCWs) was represented by:</td>
</tr>
<tr>
<td>• Lacking or inaccurate information provided by HCWs regarding HBV diagnosis or treatment(^ {40,48});</td>
</tr>
<tr>
<td>• Provision of inappropriate reassurance, or overemphasis of potential complications(^ {34});</td>
</tr>
<tr>
<td>• Poor understanding among HCWs regarding appropriate laboratory testing to diagnose HBV infection(^ {44});</td>
</tr>
<tr>
<td>Lack of knowledge among individuals with HBV was represented by:</td>
</tr>
<tr>
<td>• Lack of necessary precautions for prevention of transmission(^ {35});</td>
</tr>
<tr>
<td>• Difficulty processing information about the infection, leading to anxiety or depression(^ {49});</td>
</tr>
<tr>
<td>• Pursuit of traditional or religious interventions reflecting the belief that infection may be caused by evil spirits(^ {26,37}).</td>
</tr>
<tr>
<td><strong>Other factors associated with stigma</strong></td>
</tr>
<tr>
<td>Stigma in HBV has been associated with:</td>
</tr>
<tr>
<td>• Extremes of age (in some cases this is evident in older age(^ {9,37,41,46}) and in other reports, in younger age groups(^ {9}));</td>
</tr>
<tr>
<td>• People strongly defined by traditional values(^ {27,41});</td>
</tr>
<tr>
<td>• Lower education levels(^ {36,37});</td>
</tr>
<tr>
<td>• People who have not themselves been screened or vaccinated against HBV(^ {39}).</td>
</tr>
<tr>
<td>Among HCWs, hesitance to provide care to individuals with HBV infection was noted among:</td>
</tr>
<tr>
<td>• Those who had not come across or offered healthcare to an individual with HBV infection(^ {40,48});</td>
</tr>
<tr>
<td>• Those who perceived an infection risk to themselves(^ {39}) or had low individual confidence in protecting themselves(^ {37}).</td>
</tr>
</tbody>
</table>
Table 2. Evidence for the impact of HBV infection, identified from a literature review.

<table>
<thead>
<tr>
<th>Reduced access to appropriate health care</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Stigma is associated with reduced uptake of opportunities for diagnostic screening and clinical care&lt;sup&gt;30, 39, 44, 47, 54, 55&lt;/sup&gt;.</td>
<td></td>
</tr>
</tbody>
</table>

Impact on family and relationships

People living with HBV infection:

- May be anxious about spreading the infection to family members, and therefore distance themselves from close relationships<sup>30, 39, 44, 47, 54, 55</sup>;
- Report feeling of bringing shame upon the family<sup>54, 57, 58</sup>;
- Can experience difficulties in establishing and/or maintaining intimate relationships<sup>52, 54</sup>.

Impact on work and career

- HBV may lead to inappropriate exclusion from certain career choices (e.g. healthcare, childcare, food handling)<sup>34, 53, 60</sup>;
- Individuals with HBV infection are discriminated against at work, lose employment, or are unable to find work<sup>47, 56</sup>.

Impact on mental health

People living with HBV infection:

- May fear the physical consequences of disease progression and/or treatment side effects<sup>39, 56</sup>; this fear can perpetuate discrimination<sup>41</sup>;
- May have negative self-image and experience feelings of guilt and shame<sup>81</sup>; these are associated with shame about disclosing diagnosis<sup>56</sup>;
- May experience anxiety about economic cost of treatment<sup>60</sup>;
- Fear being stigmatised<sup>32</sup>;
- May suffer significant psychosocial morbidity, which can be more substantial than physical symptoms<sup>60</sup>;
- May face deportation if not resident in their country of origin<sup>32</sup>;
- May seek privacy and suffer fear of disclosure; this can be distinct in African communities<sup>33</sup>.
- Report feeling humiliated, embarrassed, or inferior, together with a sense of guilt and shame<sup>57</sup>.

Impact on social behavior

People living with HBV infection may suffer the following social discrimination:

- Are not allowed to share utensils / food / towels / soap, for fear of transmitting the infection<sup>96, 90, 54, 63</sup>;
- Suffer feelings of rejection or isolation, including perceptions that other people are avoiding them<sup>90, 57, 59, 63</sup>;
- Suffer feelings of ‘passivity’ because of lack of treatment, or cost of treatment, which results in missing opportunities to start treatment and defaulting clinical follow-up<sup>96</sup>;
- Develop a habit of secrecy, in order to avoid disclosure<sup>92, 94</sup>.

Relationship with education / knowledge

- Stigma may contribute to lack of awareness<sup>55</sup>;
- Lack of education about HBV is associated with discrimination<sup>45</sup>;
- There is less stigma if people are more educated or if they have a family member with HBV<sup>45, 58</sup>; conversely, familiarity with the disease and higher levels of knowledge have been associated with lower stigma<sup>45, 54</sup>;
- There is a lack of concordance as to whether education/knowledge makes stigma towards HBV better or worse – e.g. in some studies, those with more education were more worried<sup>86</sup>.

Coping strategies and interventions for HBV stigma

Coping strategies that have been described for HBV are listed (Table 3). Depending on the coping strategies used, not everyone experiencing stigma will necessarily suffer emotional distress or have diminished well-being as a consequence<sup>96</sup>. In HIV, avoidant coping strategies such as denial have been associated with higher levels of depression whereas acceptance of the diagnosis, associated with personal control and self-efficacy, is associated with reduced levels of depression<sup>95</sup>. Among patients with schizophrenia, the ability to use positive coping strategies was associated with reduced self-stigma<sup>96</sup>. Further studies are needed to explore coping strategies used to deal with HBV stigma, to exploring the choice of coping strategy, and to determine outcomes.

As well as individual coping strategies, a variety of other interventions have been proposed to tackle stigma (Table 3). In many cases, attitudes may improve after realising that infection can be prevented and managed therapeutically<sup>11</sup>. This is in line with a report from the WHO about mental illness, highlighting that stigma can be combated through educational messages representing conditions as illnesses that respond to specific treatment<sup>11</sup>.

Counselling can provide several benefits, alleviating anxiety associated with a new diagnosis, as well as providing an opportunity to share factual information regarding treatment, prevention, self-care and overall well-being<sup>84, 85</sup>. Counselling should cover a broad range of information such as the natural history.
of the disease, diagnosis, treatment, prevention and living with the infection. This should be delivered sensitively, at a time and in a manner that supports the individual in accepting and processing the information.

There are several strategies that have been used to raise awareness of HIV/AIDS which could be applied to HBV. Dissemination of factual information through use of radio, television, posters, pamphlets and drama has been widely used to diminish stigma towards HIV in resource limited settings. Multiple educational sessions can also be an effective way of increasing awareness and therefore reducing stigma, as participants have the opportunity to reflect on the concepts learnt in the previous sessions. Another successful method for training HCWs is perspective-taking and empathy: participation is associated with ‘increased willingness to treat people with certain illnesses, decreased stigma and increased awareness of confidentiality among healthcare workers.’ These approaches could be used to tackle HBV stigma among HCWs and community members.

On-line support groups provide a platform for people living with HBV to share their experiences, and charities can be influential in raising awareness, and promoting important health messages. The internet is widely used as a tool for sharing experiences, and as such can raise awareness of stigma, as well as uniting individuals and communities as a support network. It is important for HCWs to introduce newly diagnosed individuals to these avenues to help people living with HBV. Importantly, more charities and support groups that are well suited for people with HBV infection in Africa are needed.

### Discussion

Despite the limited evidence from Africa, the data we have gathered reflect consistent themes in stigma and discrimination affecting individuals with chronic viral hepatitis infection. These may have a wide-reaching influence on physical health (for example inhibiting interaction with clinical services and reducing treatment adherence), psychological well-being (through increasing isolation, anxiety and depression), and interactions with family and the wider society (by limiting relationships, social interactions and employment opportunities). Recognising, understanding and tackling the issue of this stigma in African populations could be a valuable tool to improve population health and to underpin advances towards elimination strategies proposed for the year 2030.

### Limitations and caveats

There are very few data to inform this discussion: we identified only two studies on stigma from Africa and three other studies included African participants in North America, Australia and in UK. Although we did a robust search of the peer-reviewed scientific literature, there may be other sources that are not captured by this scientific style of approach. Most studies had very small sample sizes and some were opportunistic in recruiting participants, thus limiting generalisability of the findings. We have therefore also drawn on the literature for HIV, TB and mental illness.

### Future aspiration and challenges

Studies looking at stigma may benefit from a mixed method study design, providing stronger evidence and increasing generalisability of the findings. It is important to carry out research on stigma with the aim of demonstrating its burden and its effects, while also considering how to establish and evaluate interventions that tackle stigma within communities. We identified only one study that evaluated the effectiveness of stigma reduction programmes among Asians in USA. More studies like this are needed in Africa as they will also help to deploy resources in the most appropriate and effective ways.

#### Table 3. Coping strategies and other interventions that have been used to tackle stigma in HBV, identified from a literature review.

<table>
<thead>
<tr>
<th>Coping strategies for individuals with HBV infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Seeking words of encouragement and prayers from spiritual leaders or family members;</td>
</tr>
<tr>
<td>• Lifestyle modification, such as reduced intake of alcohol and fatty foods;</td>
</tr>
<tr>
<td>• Reaching out for support from family members and friends;</td>
</tr>
<tr>
<td>• Use of support groups;</td>
</tr>
<tr>
<td>• Note that certain coping strategies may also result in negative influences, such as avoiding disclosure, disengagement from seeking active treatment, and emotional responses including grief, denial, anger and aggression.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coping strategies associated with negative influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Establishing culturally appropriate public education or awareness programmes that promote surveillance and treatment. One study presented a real-life narrative where influential people from that community talked about their experiences with HBV, emphasising the availability of treatment and prevention strategies.</td>
</tr>
<tr>
<td>• Providing specialised training about HBV infection, which may be designed to target people living with HBV, HCWs, THs, the wider public.</td>
</tr>
<tr>
<td>• Training of policy makers and healthcare professionals on the urgency of tackling HBV, and on prevention, diagnosis and treatment.</td>
</tr>
<tr>
<td>• Training of healthcare workers to provide pre- and post-test counselling.</td>
</tr>
<tr>
<td>• Developing national campaigns to promote HBV screening and vaccination. Screening and vaccination can reduce social stigma surrounding HBV.</td>
</tr>
</tbody>
</table>
In addition to raising awareness among individuals with HBV infection, the general public and HCWs, enhanced communication with policy makers is also crucial. Despite the high burden of HBV in low and middle-income countries, there is limited infrastructure to support diagnosis and treatment, and disproportionately little international research funding for HBV compared to other infectious diseases.

**Conclusion**

Stigma is a potentially major barrier to the successful implementation of preventive, diagnostic and treatment strategies for HBV infection, and yet there is very limited recognition of the magnitude of this challenge, especially in Africa. Lack of knowledge among policymakers, HCWs, the general public and patients is a potent driver of stigma. Stigma in turn, negatively impacts health behaviour such as help-seeking, screening, disclosure, prevention of transmission and adherence to treatment. Establishing education programmes and awareness campaigns is crucial. There is also a pressing need for more research in this area, to identify and evaluate interventions that can be used effectively to tackle stigma in HBV, and for collaborative efforts between policy makers, HCWs, traditional healers, religious leaders, charity organisations and support groups, to improve awareness and tackle stigma in HBV in Africa.

**Data availability**

All data underlying the results are available as part of the article and supplementary files, and no additional source data are required.

**Competing interests**

No competing interests were disclosed.

**Grant information**

JM is funded by a Leverhulme Mandela Rhodes Scholarship. PCM is funded by the Wellcome Trust (grant ref. 110110).

The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

**Supplementary material**

**Supplementary file 1:** Details of search strategy used to identify studies on stigma in Hepatitis B virus (HBV) infection, from PubMed database. The terms in each row were combined by Boolean operator ‘OR’, the columns were combined by Boolean term ‘AND’. We carried out two searches: the first search focused on stigma in HBV in Africa - we combined all the columns in search strategy (#1 AND #2 AND #3); a second search was not limited to Africa – for this we only combined columns (#1 AND #3).

Click here to access the data.

**Supplementary file 2:** Full details of 34 studies identified by a systematic literature search of stigma in Hepatitis B virus (HBV) infection published between 2005 and 2017.

Click here to access the data.

**Supplementary file 3.** Flow diagram illustrating identification and inclusion of studies for a systematic review of stigma in Hepatitis B virus (HBV) infection, based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) criteria.

Click here to access the data.

**References**

5. Hepatitis B Foundation. Reference Source
10. Turan JM, Nyblade L: HIV-related stigma as a barrier to achievement of global

Page 7 of 9