

1 **PREVALENCE OF HEPATITIS B VIRUS INFECTION AMONGST ASYMPTOMATIC**  
2 **PERSONS VISITING BRAITHWAIT MEMORIAL SPECIALIST HOSPITAL (BMSH),**  
3 **RIVER STATE, NIGERIA.**

4  
5 **ABSTRACT**

6 Statistics has shown that Hepatitis B virus infects more than 400 million people worldwide. In  
7 recent years, the overall prevalence of this virus has declined due to its vaccine that is now in  
8 circulation. Hepatitis B virus causes liver injury by an immune response against the virus-  
9 infected liver cells but it's not directly cytopathic, but immunosuppression enhances replication  
10 and can lead to direct cytotoxicity. In this study, A survey was conducted amongst 200 randomly  
11 selected general out-patients within the ages of 10-80 years with pregnant women inclusive who  
12 are attending the Braithwait Memorial Specialist Hospital (BMSH) River State, Nigeria, in order  
13 to ascertain the prevalence of Hepatitis B virus infection among patients attending Braithwait  
14 Memorial Specialist Hospital in Rivers State, Nigeria and the general knowledge of the people  
15 about this highly infectious disease. Sera collected were screened for the presence of Hepatitis B  
16 surface antigen (HBsAg) using Labacon Diagnostic Test Strip (Hangzhou Biotest Biotech Co.,  
17 Ltd China). Questionnaires were distributed to the subjects in order to ascertain their perceptions  
18 about the disease, and to obtain useful socio-demographic information. A total of 32 out of the  
19 200 respondents tested positive of Hepatitis B surface antigen, giving a percentage of 16%  
20 (32/200). There was a poor management and prevention control of the disease and this may have  
21 accounted for the prevalence of 16% in the study population.

**Comment [OP1]:** Advice to rewrite abstract following scientific format. Many unnecessary statement here.

22 **INTRODUCTION**

23 Hepatitis B virus infection is a major public health problem worldwide; roughly 30% of the  
24 world's population show serological evidence of current or past infection. Hepatitis B virus is a  
25 partly double-stranded DNA virus with several serological markers: HBsAg and anti-HBs,  
26 HBeAg and anti-HBe, and anti-HBc IgM and IgG. It is transmitted through contact with infected  
27 blood and semen (Trépo *et al.*, 2014). Hepatitis B virus was discovered in 1966 and we are yet to  
28 understand fully its intricacies. Hepatitis B viral infection is a major health problem with  
29 preference for the liver and is known to commonly lead to chronic infections (Ocama *et al.*,  
30 2005). The chronic infection increases the risk of death from childhood hepatic failure, cirrhosis  
31 of the liver to liver cancer. Globally, over 300 million people have chronic liver infections and  
32 about 600,000 people die annually from acute or chronic complications of hepatitis B infection  
33 (WHO, 2014). The highest prevalence of hepatitis B infection is in sub-Saharan Africa and East  
34 Asia. Majority of the people in these regions become infected during childhood and between 5–  
35 10% of the adult population is chronically infected (WHO, 2016).

36 Several studies in children and adult have recorded prevalence rates of hepatitis B surface  
37 antigen (HBsAg) ranging from 4.1% to 44.7% varying from one region to another (Ugwuja, *et*  
38 *al.*, 2010). In a study done by Musa, *et al.*, (2015), the pooled prevalence of HBV in Nigeria was  
39 13.6% and for children were 11.5%. HBV prevalence in Nigeria also varied by the screening  
40 method used; the result varied from 12.3% by enzyme-linked immunosorbent assay; 17.5% by  
41 immunochromatography; and 13.6% by HBV DNA polymerase chain reaction. Thus, hepatitis B  
42 Virus infection is hyper-endemic in Nigeria and may be the highest in sub-Saharan Africa.

43 Hepatitis B virus (HBV) is a major cause of morbidity and mortality worldwide, accounting for  
44 over 360 million cases of chronic hepatitis and 620,000 deaths per year. More than 8% of the  
45 population are infected in Sub-Sahara Africa (SSA) and it is a major cause of chronic liver

46 diseases. Estimated that 44% of cirrhotic liver disease and 47% of hepatocellular carcinoma  
47 cases in Sub-Sahara Africa are attributed to HBV.

48 HBV account for a substantial portion of liver diseases worldwide and infected individuals can  
49 remain asymptomatic for decades. However, more than 80% of them become chronic carriers  
50 which result in an increased risk of liver cirrhosis, liver cancer and liver failure 20 - 30 years  
51 later (Ugwuja *et al.*, 2010).

52 In Nigeria, many investigators have found high HBV prevalence in adults and infants. Musa, *et*  
53 *al.*, (2015) in his study, found that among 440 HIV positive patients, 12.3% were co-positive for  
54 HBV although pregnant women are generally considered low risk for HBV infection. In southern  
55 parts of Nigeria, up to 58.1% of patients with chronic liver disease were found HB positive.

56 Hepatitis B virus (HBV) is the causative agent of hepatitis B infection. It is 50 - 100 times more  
57 infectious than HIV with many carriers not realizing they are infected with the virus, thus it is  
58 often referred to as a "silent killer. The minimum infectious dose is so low that such practices  
59 like sharing a tooth brush or a razor blade can transmit infection. The virus has been detected in  
60 peripheral mononuclear cells, tissues of pancreas, spleen, kidney and skin, and fluids like saliva,  
61 semen, sweat, breast milk, tears, urine and vaginal secretion (Chen, *et al.*, 1996).

62 In view of the advantages of early detection and prevention, this study is designed to determine  
63 the prevalence of HBV in an apparently healthy population. This is with a view to providing data  
64 for further research and awareness campaign for the need to know one's hepatitis status  
65 especially in HBV endemic area.

## 67 | **MATERIALS AND METHOD**

### 68 **STUDY AREA**

69 This study was carried out from 21<sup>st</sup> May through 7<sup>th</sup> June 2018 at Braithwait memorial  
70 Specialist Hospital (BMSH), with focus on 200 patients attending General out-patient  
71 department (GOPD) with pregnant women inclusive and were randomly selected within the ages  
72 of 10 to 80 years. The patients were requested to fill a set of questionnaire which was completed  
73 and returned immediately.

### 74 **SPECIMEN**

75 A serum specimen is recommended for this diagnosis

- 76 • Serum can be separated from the clot in an ethylene di-amine tetra acetate (EDTA) bottle,  
77 within one hour after collection.

### 78 **SAMPLE COLLECTION**

79 For the purpose of this study, blood samples were collected by venous puncture techniques.  
80 Blood samples were collected and transferred into a sterile ethylene plain bottle and properly  
81 labelled. The serum was then screened with a one-step Labacon Diagnostic test strip.

### 82 **HEATITIS B SURFACE ANTIGEN (HBsAg) DETECTION.**

83 The Hepatitis B surface antigen was tested using an in-vitro diagnostic kit "LABACON HBsAg  
84 test strip" manufactured by Hangzhou Biotest Biotech Co., Ltd China.

85 The test strip is a quantitative, solid phase, two sides, sandwich immunoassay.

86 The Hepatitis test strip was dipped into each tube containing serum with the arrow pointing  
87 downwards for 10 minutes, before checking and interpreting the results.

### 88 **RESULT INTERRETATION**

89 After the 10 minutes,

- 90 • A red line appearing on the control line (C) alone indicates a negative result.

**Comment [OP2]:** Check typo and grammar errors.  
Check for misspelled and misused words.  
Unnecessary statement should be avoided.

- Two red lines on the test (T) and control (C) line indicates a positive result showing the presence of the hepatitis B surface antigen.
- A red line appearing on the test (T) line alone indicates an invalid result and the test should be repeated.

**PRECAUTIONS TAKEN**

The precautions taken in the course of this work are as follows:

Only asymptomatic persons were considered

The use of grossly haemolysed samples were avoided

The test strip was checked for date of expiration.

Mixed screening was avoided to ensure accurate result interpretation.

Laboratory coat and gloves were worn during the whole procedure to prevent direct contact with the samples.

The work bench was properly disinfected using bleaching agent and ethanol before and after the test.

Care was taken to avoid spillage of the blood samples which could be contagious.

The test needles were perforated and properly discarded.

**Comment [OP3]:** Rewrite methodology following format of previous and related literatures.

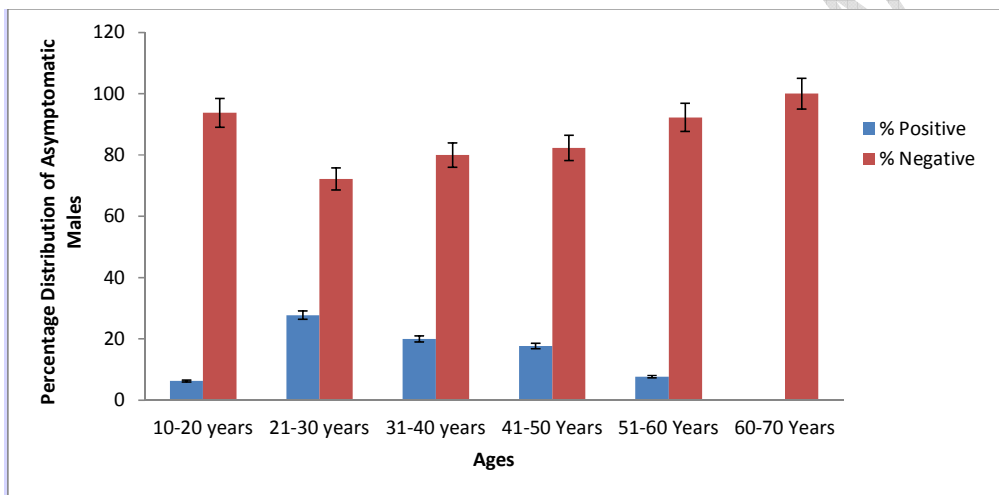
**RESULTS AND DISCUSSION**

**Table 1. Prevalence of HBV Infection in Relation To Knowledge and Risk Factors among the Study Population**

S/n	Factors	Number Screened	Positive (%)
1	Heard of HBV before		
	Yes	182	10 (5%)
	No	18	14(7%)
2	Screened for HBV before		
	Yes	38	7(3.5)
	No	162	25(12.5)
3	Ever received HBV immunization		
	Yes	146	0
	No	54	22(11%)
4	Family History of HBV		
	Yes	12	9(4.5%)
	No	188	23(11.5%)
5	Do You take alcohol		
	Yes	32	13(6.5%)
	No	168	19(9.5%)
6	Do you share clothing?		
	Yes	30	11(5.5%)
	No	170	21(10.5%)
7	Are you a health worker		

	Yes	30	2(1%)
	No	170	30(15%)
8	Are you pregnant		
	Yes	50	2(1%)
	No	150	30(15%)
9	Ever had blood transfusion		
	Yes	94	6(3%)
	No	106	26(13%)

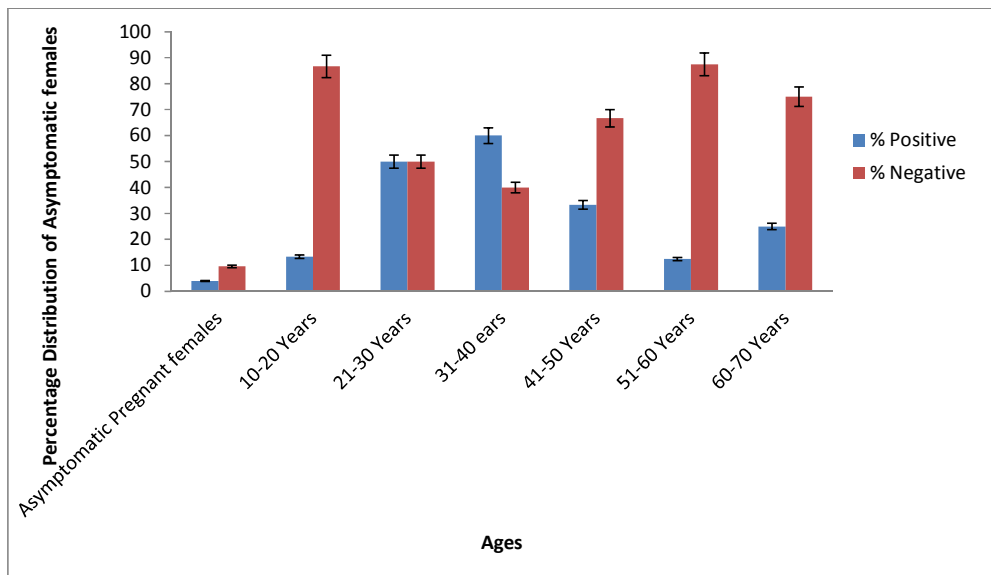
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Fig.1. Distribution of Asymptomatic males

**Comment [OP4]:** No statistical analysis performed to the data collected. Find a better way of presenting tables and figures.



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Fig.2. Asymtomatic Females

**RESULTS BASED ON SPECIFIC OBJECTIVES**

A total of 200 asymptomatic persons volunteered to participate in the study and the prevalence of hepatitis B virus was calculated to be 16% (32/200). There was a marked difference in the distribution of HBsAg by age group, sex and marital status. Individuals of both sexes who were above 50 years had the lowest prevalence. The distribution of HBV infection according to gender was statistically significant. However, higher prevalence was recorded among female respondents 8.5% (17/200) than the male respondents 7.5 % (15/200). There was an observed statistical significant difference between HBs Ag and marital status. Out of the 105 singles of both males and females who participated in the screening exercise, the seropositive prevalence was 10.5% (21/200). Furthermore, out of the 95 married respondents with pregnant women, non-pregnant women and men inclusive. 2.5% (5/200) married males were found positive, 2% (4/200) non-pregnant females and 1% (2/200), of the 50 pregnant women that was screened were positive mothers of hepatitis B virus. Similarly, the prevalence of hepatitis B was highest in patients with age group 21 to 40 years i.e 9.5 % (19/200). Followed by 1.5% (3/200) prevalence in age group 10 to 20 years. The hepatitis B was not detected in male patients within the age of 60 to 80 years. But was detected in female patients of the same age with the prevalence of 0.5% (1/200) Based on the assessment of the administered questionnaires, 91% (182/200) have heard of hepatitis B before, 9 % (18/200) have not heard of it before, hence exhibiting a high knowledge of the disease. 73% (146/200) have been previously vaccinated of the virus and none was found positive, 27% haven't been vaccinated before thus giving rise to 11% positive. 6% (12/200) have had a family

141 history of hepatitis B and 4.5% (9/200) were found positive. 19% of the respondents have been  
142 screened of the virus before while 81% have not been vaccinated.

143 15% (30/200) previously shared clothing and 5.5% were found positive. 16% (32/200) drink  
144 alcohol and smoke cigarette 9.5% of them testing positive. 15% (30/200) were health workers  
145 and 1% positive was found.

146 There were 2 positive cases observed among 5% (10/200) of the study population which had  
147 participated in voluntary blood donation before this study was conducted.

148 Of the respondents 47% (94/200) were found to have undergone blood transfusion and a positive  
149 of 3% was indicated.

150 This survey has revealed a 16% (Fig.1 and 2) prevalence of HBsAg among randomly selected  
151 general out patients attending Braithwait Memorial Specialist Hospital (BMS) Port Harcourt,  
152 River State, Nigeria, indicating the occurrence of HBV infection among asymptomatic  
153 individuals. This further means that HBV infection is endemic in the area of study, and this may  
154 be attributed to poor management of its mode of transmission, individual behaviour and practices  
155 in the study population.

156 The prevalence reported in this study is higher than 8.3% prevalence reported in a previous study  
157 conducted by Luka *et al.* (2008) at Ahmadu Bello University Zaria, Kaduna State, Nigeria. The  
158 prevalence of 16% reported in this study is also higher than, 12.6%, 9.3% and 14% prevalence  
159 reported by (Ezegbudo *et al.*, 2008., Ugwuja *et al.*, 2010 and Chukwuka *et al.*, 2004) in Nnewi,  
160 Akwa and Abakiliki, Nigeria respectively.

161 This present study revealed a high prevalence of HBsAg among the young and middle aged.  
162 This study is in agreement with some of the studies conducted by Eke *et al.* (2011) in Nnewi,  
163 Nigeria over time, which have shown no significant difference in the occurrence of HBV  
164 infection between male and female (Kaine and Okafor, 1983 and Emechebe *et al.*, 2009). This  
165 therefore suggests that gender is not a predisposing factor, but that both male and female are  
166 equally predisposed to HBV infection. The lower HBV infection observed among married  
167 people may be more particularly with regards to being faithful to their spouses and keeping away  
168 from having multiple sexual partners.

169 The low prevalence of HBV infection among persons well informed about the disease could be  
170 as a result of the fact that, the knowledge acquired about prevention and control of the disease  
171 was translated to into practice by this group of people. Likewise, persons with poor knowledge  
172 or who haven't heard about the HBV infection, transmission, prevention and control, had no  
173 prior knowledge and this probably increased their chances of exposure to the virus.

174 The low prevalence of people going for voluntary screening for HBV only reiterates the rate of  
175 poor knowledge about HBV infection in the study population.

176 The low prevalence of people who share clothing could be as a result of poor knowledge and  
177 poor hygiene. Knowledge of one's status is key to adopting adequate measures which could avert  
178 negative consequences in the future.

179 Immunization is regarded as the most effective control measures for HBV; the vaccine is said to  
180 be safe and effective in prevention of chronic carrier state development (WHO, 1998). The  
181 statistically significant association between hepatitis B immunization status and seropositive of  
182 HBsAg in this study collaborates the above statement, as none of the respondents who has been  
183 immunized prior to this study had HBV infection.

184 Blood donation and transfusion are important risk factors of HBV infection. Transfusion of  
185 infected blood is major risk factor, this observation is in agreement with studies by (Multimer *et*

186 *al.,1994., Ali et al.,2006 and Sarwar et al.,2010).* Which rank blood transfusion of blood  
187 products as the most common risk factor for HBV transmission.

### 188 **SUMMARY**

189 The prevalence of hepatitis B in asymptomatic persons attending the General Out-Patient  
190 Department (GOPD), in Braithwait Memorial Specialist Hospital (BMSH), appeared to be 16%  
191 (32/200).

192 According to World Health Organisation (WHO) and global epidemiological distribution of the  
193 hepatitis B virus, the 16% indicates a high prevalence.

194 Despite the fact that 91% (182/200) of the respondents have heard of the virus before as shown  
195 by the administered questionnaires, there was still a high prevalence of the virus.

196 This may be due to the following reasons.

- 197 1. They only heard of the hepatitis B virus and may not have known how to avoid it's route  
198 of transmission.
- 199 2. They might have known how to avoid its route of transmission but did not adhere  
200 properly to the rules and regulations.

201 Based on these findings, I therefore recommend that the following should be put into practice

202 There should be accurate behavioural modifications

203 Abstinence from unprotected sex with an infected individual.

204 Active immunization

205 Hepatitis B awareness campaign to enlighten the masses about the virus, it's route of  
206 transmission, prevention and control strategies.

### 207 **RECOMMENDATION**

208 In order to effectively manage hepatitis B surface antigen virus to an extent in which it will seem  
209 that the virus has been eliminated, the following should be taken into consideration.

- 210 • Sharing of clothing should be avoided as this is one of the major routes of transmitting  
211 the virus.
- 212 • Individuals should always in go for screening exercises to help them know their status. If  
213 positive, treatment should be started immediately and if negative, he or she should be  
214 vaccinated to remain safe.
- 215 • Pregnant mothers should be tested appropriately to know their status.
- 216 • Excessive intake of alcohol should be discouraged as this could trigger the inactive  
217 carrier state.
- 218 • Those who are already positive should always go for check-ups at 6-12 month intervals,  
219 to know their ALT levels.
- 220 • They should not be stigmatized, but universal precautions should be carefully taken.
- 221 • They should not donate blood, tissue, organ or semen as these could transmit the virus.
- 222 • New born babies should be vaccinated at birth with active and passive immunization  
223 within 12 hours of the birth.
- 224 • In summary, every individual should be vaccinated of HBsAg virus as this will go a long  
225 way in controlling the disease.

**Comment [OP5]:** State your limitations and further studies for your work.

**Comment [OP6]:** Rewrite and follow Journal guideline for arrangement.

## 232 | REFERENCES

- 233 Ali, S.A., Rafe, M.J., Donahue Qureshi, H and Sten, H.V. (2006): Hepatitis B and C in  
234 Parkistan, prevalence and risk factors. *International Journal Infectious Disease*, 13(1):9-  
235 19.
- 236 Chen H.L, Chang, M.H, Ni Y.H, Hsu, H.Y, Lee, P.I, Lee C.Y (1996). Seroepidemiology of  
237 hepatitis B virus infection in children: Ten years of mass vaccination in Taiwan. *JAMA*  
238 276:906-908.
- 239 Chukwuka J.O., Barunch Blumberg, Ezechukwu, C.C., Egburonu, I., Okoli, C.I. (2004):  
240 Prevalence of Hepatitis B. 5<sup>th</sup> ed. Pathophysiology, Missouri: Sanders, p.88-887.
- 241 Eke A.C., Eke, U.A., Okafor, C.I., Ezebiale, I., Ogbuagu C., (2011): Prevalence, correlates  
242 And patterns of Hepatitis surface antigen in low resource settings. *Virology Journal*, 8  
243 D., Rodger S. (1994): Viral Hepatitis in Nigeria Sickle Cell Disease and commercial  
244 blood donors. *QJM*, 87: 407-11.
- 245 Emechebe G O, Emodi I J, Ikefuna A N, Igwe W C, Ejiifor O S, Ikechikwu C A. (2009):  
246 Hepatitis B virus infection in Nigeria- A review. *Nigerian Medical Journal*,  
247 50:18-22.
- 248 Ezegbudo C.N., Agbonbhor, D.E., Nwosu, G.O., Igwe, C.U., Agba, M.I., Okpala, H.O.  
249 (2004): The seroprevalence of Hepatitis B surface antigen and human  
250 immunodeficiency virus (HIV) among pregnant women in Anambra State. *Sharaz E-  
251 Medical Journal*, 5(2): 1-8.
- 252 Kaine W.N. and Okafor, G.O. (1983): Hepatitis B Surface Antigen in Nigeria Children with  
253 Sickle Cell Anaemia. *Journal of Tropical Paediatrics*, 29: 55-57.
- 254 Multimer D. J., Olomi A., Skidmore S., Olomu N., Rathliffe D., Rodger S., Olomu N., Ratcliff  
255 D., Rodger S. (1994): Viral Hepatitis in Nigeria Sickle Cell Disease and commercial  
256 blood donors. *QJM*, 87: 407-11.
- 257 Musa B.B., Bussel., Borodo M.M., Samalia A.A., Femi I.L. (2015): Prevalence of Hepatitis  
258 B virus infection in Nigeria., A systematic review and meta-analysis.  
259 *Nigerian Journal of Clinical Practice*, 18 (2): 163-172.
- 260 Ocamá., P., Opio, C.K., Lee, W.M. (2005). Hepatitis B virus infection: Current status. *The  
261 American Journal of Medicine*. 118, 1413.e15-1413.e22
- 262 Trépo., C., Chan., L.Y.H. and Lok, A. (2014) .Hepatitis B virus infection. *Lancet*. DOI:  
263 [https://doi.org/10.1016/S0140-6736\(14\)60220-8](https://doi.org/10.1016/S0140-6736(14)60220-8).
- 264 Luka, S.A., Ibrahim, M.B., and Iliya, S.N. (2008): Seroprevalence of hepatitis B surface Antigen  
265 Among pregnant women attending Ahmadu Bello University Teaching Hospital, Zaria,  
266 Nigeria. *Journal of Parasitology*, 29(1):38-41.
- 267 Sarwar, J., Ahmad, W., Saleem, M., Jamshed, F., Gul, N., and Idrees, M. (2010): Frequency of  
268 Hepatitis B in asymptomatic patients of District Head Quarters Hospital, Koth, Azad  
269 Kashmir. *J. Ayub Med. Coll Abbottad*, 22(4): 139-142.
- 270 Ugwuja, E.I., Nakao K, Toriyama K, Ishikawa Heguchi K. (2010): Seropalence of hepatitis B  
271 surface antigen and liver function test among adolescents in Abakiliki, South Eastern  
272 Nigeria. *Internet journals of Tropical Medicine*, 6(2):1-6.
- 273 WHO (2014): No Scientific Justification to suspend Hepatitis B Immunization.  
274 online: <http://V.r.who.int.inf-fr-1998/en/pr98-67.htm> Date accessed 23rd August 2018.

**Comment [OP7]:** Follow Journal's guideline for referencing.

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275 WHO (2016): Hepatitis B. WHO Fact sheet. Online: [www.who.int/mediacentre/factsheets](http://www.who.int/mediacentre/factsheets) .  
276 Updated July, 2016. Assessed 18<sup>th</sup> July, 2018.

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UNDER PEER REVIEW