

# Public awareness of hepatitis B infection: a population-based telephone survey in Hong Kong

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**Objective** To test our hypothesis that there is inadequate knowledge and awareness of hepatitis B infection among the general population in Hong Kong.

**Design** A random telephone survey using a structured multiple-choice questionnaire.

**Setting** Hong Kong community.

**Participants** Hong Kong residents aged 18 years or above.

**Results** A total of 506 respondents were successfully interviewed in February 2010. Approximately half of respondents (55%) were aware that hepatitis B virus is the most common cause of chronic viral hepatitis in Hong Kong. Regarding knowledge about the mode of transmission, mother-to-infant transmission and blood contact were recognised as risk factors by 67% and 65% of respondents, respectively. Transmission by sexual contact, sharing a razor or toothbrush, and tattooing or body piercing were appreciated by 44%, 41%, and 37% of respondents, respectively. A majority (73%) had the mistaken belief that the virus is transmitted by eating contaminated seafood. Over half of respondents (53%) knew nothing about the clinical presentation of acute hepatitis B. Only 35% of respondents realised that periodic abdominal ultrasonographic examinations are indicated for asymptomatic hepatitis B carriers. While 51% of respondents reported being tested for hepatitis B virus infection, only 36% acknowledged being vaccinated against the infection. Education level, occupation, and marital status were factors associated with both hepatitis B virus screening and vaccination.

**Conclusion** These findings support our hypothesis that there is inadequate knowledge and awareness about hepatitis B infection in the general population in Hong Kong.

## Key words

Awareness; Health knowledge, attitudes, practice; Health surveys; Hepatitis B

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## Introduction

Hepatitis B virus (HBV) infection is a major global health problem because of its worldwide distribution and potential adverse sequelae. It is of particular concern in the Asia Pacific region where chronic HBV infection is prevalent. It is estimated that chronic HBV infection affects more than 350 million people worldwide,<sup>1</sup> of whom approximately 75% are Asian.<sup>2</sup> Chronic HBV infection leads to a high burden of liver disease and hepatocellular carcinoma (HCC). A prospective study involving 684 patients with chronic hepatitis B showed that cirrhosis developed with an estimated annual incidence of 2.1%.<sup>3</sup> Patients with chronic HBV infection have a greater than 100-fold risk of developing HCC compared to uninfected individuals.<sup>4</sup> The annual incidence of HCC development in patients with chronic HBV infection ranges from 0.2 to 0.8% in different centres.<sup>5-7</sup> More than a quarter of chronic HBV carriers eventually die from HBV-related complications, such as cirrhosis-related complications or HCC.<sup>8,9</sup>

Hepatitis B virus infection remains a major public health concern in Hong Kong with a carrier rate of about 8%. Chronic HBV infection and its related complications are a significant economic burden to the health care budget of Hong Kong.<sup>10</sup> Despite the introduction of universal HBV vaccination in 1988, this infection remains the major cause of chronic liver disease and the commonest indication for liver transplantation in Hong Kong.<sup>11,12</sup> Chronic HBV infection has a negative impact on health-related quality of life (HRQOL). In a cohort of Chinese patients with chronic HBV infection at different stages,

## 香港市民對乙型肝炎的認識與關注： 電話問卷調查

- 目的** 以對乙型肝炎的知識不足為假設，測試香港市民對乙型肝炎的認識與關注。
- 設計** 根據包含多項選擇題的問卷進行隨機抽樣電話訪問。
- 安排** 香港社區。
- 參與者** 18歲或以上的本港居民。
- 結果** 調查於2010年2月進行，透過電話成功訪問了506名市民。調查發現五成半被訪者能正確指出乙型肝炎為目前本港最普遍的慢性病毒肝炎。接近七成被訪者知道乙型肝炎病毒可以透過母嬰接觸（67%）及血液接觸（65%）傳染，但少於一半被訪者知道性接觸（44%），共用鬚刨、剃刀或牙刷（41%）及穿環或紋身（37%）亦有機會感染乙型肝炎病毒。然而，高達七成三的被訪者誤以為進食受污染的海產會感染乙型肝炎病毒。五成三的被訪者對急性乙型肝炎的病徵全無認識。僅三成半被訪者意識到乙型肝炎帶病毒者需要定期進行腹部超聲波掃描。調查同時顯示，一半被訪者（51%）表示曾經接受過乙型肝炎的驗血測試，但僅約三分之一（36%）被訪者表示曾經接受過乙型肝炎疫苗注射。接受乙型肝炎驗血測試和疫苗注射均與下列因素相關：教育程度、職業及婚姻狀況。
- 結論** 市民對乙型肝炎的認識與關注並不足夠。

HRQOL was significantly inferior to that of the population norm.<sup>13</sup>

Despite its high prevalence and potential adverse sequelae, there is little research that sheds light on the knowledge and awareness of HBV infection among the general population in Hong Kong. In a recent prospective observational study of local pregnant Chinese women, the overall prevalence of HBV vaccine uptake was only 33%,<sup>14</sup> which may indicate insufficient public awareness of HBV. We therefore conducted this random telephone survey to test our hypothesis that there is inadequate knowledge and awareness about HBV infection in the general population in Hong Kong.

## Methods

### Study design

The study was organised by the Hong Kong Liver Foundation. A structured questionnaire consisting of 12 multiple-choice questions was designed to assess respondents' understanding and perception about HBV infection (Appendix). The interview started by asking six questions addressing general knowledge about HBV, including its mode of transmission and symptoms of acute infection. Another six questions were related to monitoring of HBV carriers and the possible sequelae of infection. In addition, six questions were incorporated to explore the health

status of the respondents including their drinking habits and history of prior liver function testing as well as their practices towards HBV screening and vaccination. The respondents were asked to recall whether they had had HBV testing, the results of the blood test, and whether they had received HBV immunisation. The final section of the questionnaire addressed demographics including: age, sex, marital status, education level, occupation, and family history of HBV carriage. The questionnaire was developed in English by a panel of hepatologists. The questions were translated into the Chinese version by the Public Opinion Programme (POP) of the University of Hong Kong, then back translated into English and compared with the original questions. Differences were modified accordingly. A panel of hepatologists using the initial questions interviewed 12 non-medical personnel who were voluntarily recruited from non-clinical clerical staff of several public hospitals. The responses and wordings of the questionnaire were discussed and modified accordingly. Content validity was established by a panel of hepatologists. The test-retest reliability was assessed by delivering the questionnaire to 20 subjects twice at an interval of 14 days.

### Data collection

Random telephone interviews were conducted by the POP of the University of Hong Kong, using standard telephone sampling methods and the following techniques to minimise sampling bias. Telephone numbers were first drawn randomly from the residential telephone directories as 'seed numbers', from which another set of numbers was generated using the 'plus/minus one/two' method, to capture the unlisted numbers. Duplicated numbers were then filtered, and the remaining numbers were mixed in random order to produce the final telephone sample. Hong Kong residents aged 18 years or above who spoke Cantonese constituted the target population of this survey. When more than one qualified subject was available in a household, selection was made using the 'next birthday rule'.

The sampling procedures, fieldwork operation, and data collection were conducted with the assistance of the Computer-Assisted Telephone Interviewing System. Before data collection started, to minimise inter-observer variation, prior training and project briefings were held to make sure that all interviewers understood the survey requirements clearly. The interviewers initially performed trial interview with the panel of hepatologists and then subjects were randomly selected under supervision from the telephone directory. Any mistakes, misinterpretations, or inconsistency were corrected. Throughout the fieldwork period, measures were in place to ensure data quality by closely monitoring the

interviewers' performance, which included on-site supervision by the corresponding supervisors and voice recordings of all interviews. If any discrepancies were identified, immediate remedial actions were taken. Random checks of the successful cases were also carried out upon fieldwork completion by replaying the audio records of different interviewers involved with the corresponding supervisor. The latter had to be satisfied with the responses recorded by the interviewers in the selected cases.

### Study sample

According to international standards in the field of public opinion surveys, we aimed to obtain an initial sample size of about 500 subjects with an estimated sampling error rate of  $\pm 4.4$  percentage points at a

95% confidence level based on the population size of about 7 million in Hong Kong. The telephone survey was conducted from 19 to 25 February 2010 and 506 respondents were successfully interviewed. The overall response rate was 69.2%. Data were missing for fewer than 1% of each of the 12 multiple-choice questions, and were accordingly excluded from the denominator in the analysis.

### Statistical analysis

The intraclass correlation coefficient was calculated for the test-retest reliability. To ensure representativeness of the findings, the raw data were adjusted according to provisional figures obtained from the Census and Statistics Department regarding the gender-age distribution of the Hong Kong population in mid-2009. All analyses were based on the weighted sample. Descriptive statistics were reported for demographic variables including age, gender, occupation, education level, and marital status. Chi squared tests were conducted between the dependent variables for persons being screened and vaccinated and the independent variables for demographics. All P values were two-sided. A P value of less than 0.05 was regarded as statistically significant.

### Results

The questionnaire exhibited good test-retest reliability with an overall intraclass correlation coefficient of 0.8. Demographic characteristics of the respondents are shown in Table 1. There were 506 respondents with a mean age of 47 (range, 18-88) years. Most respondents were married (65%) and had received at least secondary school (52%) or higher (33%) education.

### Knowledge about prevalence of hepatitis B virus infection

About half the respondents (55%) were aware that HBV is the commonest cause of chronic viral hepatitis. Hepatitis A was mentioned by 21% of them while 23% expressed no ideas about it, and hepatitis C and D were cited by a minority (<1%). In all, 40% had no idea about the prevalence of HBV carrier rates in Hong Kong, while 27% thought the prevalence to be above 10%. Prevalence rates of less than 2%, 2-4%, 5-7% and 8-10% were cited by 3%, 11%, 9%, and 10% of respondents, respectively.

### Knowledge about transmission of hepatitis B virus

Regarding knowledge about the mode of transmission, mother-to-infant transmission and blood contact were recognised by 67% and 65%

Table 1. Demographic characteristics of respondents (n=506)

Characteristics	No. (%)
Gender	
Male	234 (46)
Age-group (years)	
18-20	23 (5)
21-29	76 (15)
30-39	95 (19)
40-49	109 (22)
50-59	93 (19)
$\geq 60$	105 (21)
Education attainment	
Primary school or below	72 (14)
Secondary school	261 (52)
University or above	167 (33)
Occupation	
Executives and professionals	102 (21)
Clerical and service workers	126 (26)
Production workers	44 (9)
Students	41 (8)
Housewives	85 (17)
Others	91 (19)
Marital status	
Married	325 (65)
Single	161 (32)
Divorced	11 (2)
Habitual alcohol consumption*	63 (12)
Prior liver function testing	189 (37)
Prior HBV <sup>†</sup> serologic testing	258 (51)
Prior HBV vaccination	184 (36)
Family history of HBV carriage	58 (11)

\* Habitual alcohol drinker denotes alcohol drinking more than once a week

<sup>†</sup> HBV denotes hepatitis B virus

of respondents, respectively. Sexual contact was realised by 44% of respondents, while sharing a razor or toothbrush was identified by 41%. Only about one-third of respondents (37%) indicated that tattooing or body piercing could spread the virus. The majority of respondents (73%) had the mistaken belief that the virus could be contracted by eating contaminated seafood. Over half of all respondents (55%) had a misconception that a HBV carrier mother should avoid breastfeeding. When prompted to choose the major route of acquiring the infection from HBV carriers in Hong Kong, transmission by eating contaminated seafood was opted by 43% of respondents. Mother-to-infant transmission, transfusion of infected blood products, sexual contacts, and sharing injection instruments were cited by 17%, 13%, 10%, and 9% of respondents, respectively.

### Knowledge about symptoms of acute hepatitis B and monitoring of carriers

Over half of all respondents (53%) knew nothing about the clinical presentation of acute hepatitis B. Yellow discolouration of skin, weakness and fatigue, upper abdominal discomfort, nausea and vomiting,

and loss of appetite were cited by 27%, 14%, 14%, 7%, and 4% of them, respectively. When asked further as to whether normal liver function test results could exclude a person from being a HBV carrier, 22% of respondents gave an affirmative answer, 59% thought not, and 19% had no idea. A majority of respondents (83%) believed that periodic liver function test monitoring was necessary, but only 35% thought that periodic abdominal ultrasonographic examination was indicated.

### Knowledge about sequelae of chronic hepatitis B virus infection

With respect to complications of chronic HBV infection, 78% of respondents were aware that HBV infection could lead to liver cirrhosis. Progression to liver cancer and liver failure were mentioned by 72% and 71% of respondents, respectively. Of the 366 respondents who realised that individuals with HBV infection had an increased risk of developing liver cancer, only 1% recognised that the relative risk is 100-fold higher than that in uninfected individuals. One-third (34%) of respondents believed the lifetime risk of a hepatitis carrier dying from HBV-related complications was above 20%, while 29% had no idea. Figures of less than 5%, 6-10%, 11-15% and 16-20% were cited by 10%, 15%, 6% and 6% of respondents, respectively.

### Practices on hepatitis B virus screening and vaccination

About half of respondents (51%) recalled having been tested for HBV infection in the past. There were significant differences in HBV screening depending on education level, occupation, marital status, prior liver function testing, and family history of HBV carriage (Table 2). Respondents previously tested for HBV infection had a higher proportion who were married, received a university education, and were working as professionals or executives. Of 255 respondents who reported being tested, 175 (69%) mentioned that they had no evidence of previous HBV infection, 18 (7%) were hepatitis carriers and 42 (16%) deemed that they were immune; 20 (8%) respondents could not recall the results of the blood test. For persons who appeared susceptible to HBV infection (n=175), 56% recalled that they had received HBV vaccination. Of 248 respondents who had not been serologically tested for HBV, 29%, 11%, 39%, 48% and 47% of them thought the results of the blood test would influence their personal planning in the coming few years in terms of travelling abroad, getting married, having a baby, purchase of medical insurance, and saving a sum of money for medical treatment, respectively. Slightly over one third (36%) of the respondents indicated that they had been

Table 2. Screening behaviour for hepatitis B virus (HBV)

Characteristics	Screened for HBV (n=258)	Not screened for HBV (n=226)	P value
Gender			
Male	116 (45%)	111 (49%)	0.426
Age (years)*	45 ±14 (18-84)	44 ±18 (18-88)	0.529
Education attainment			0.001
Primary school or below	23 (9%)	43 (19%)	
Secondary school	132 (51%)	121 (54%)	
University or above	103 (40%)	62 (28%)	
Occupation			<0.001
Executives and professionals	69 (27%)	33 (15%)	
Clerical and service workers	74 (29%)	51 (23%)	
Production workers	14 (5%)	28 (12%)	
Students	5 (2%)	37 (16%)	
Housewives	54 (21%)	28 (12%)	
Others	42 (16%)	49 (22%)	
Marital status			0.018
Married	183 (71%)	132 (58%)	
Single	71 (28%)	87 (38%)	
Divorced	4 (2%)	7 (3%)	
Habitual alcohol consumption	32 (12%)	31 (14%)	0.639
Prior liver function testing	158 (61%)	26 (12%)	<0.001
Family history of HBV carriage	45 (17%)	13 (6%)	<0.001

\* Data are shown as mean ± standard deviation (range)

vaccinated against hepatitis B, while 55% indicated they had not been vaccinated. The remaining (8%) did not know their vaccination status. There were significant differences in HBV vaccination by age, education level, occupation, marital status, and prior HBV serologic testing (Table 3). Respondents who had had HBV vaccination had a higher proportion who were single, had received a university education, and were working as professionals or executives.

## Discussion

This study was a population-based telephone survey exploring the knowledge, awareness, and practices of the public, in regard to HBV infection in Hong Kong. In terms of cost, time, and manpower, conducting a telephone survey is far more efficient than a face-to-face interview. A telephone coverage rate of more than 98% for Hong Kong justify resorting to a telephone survey for the local community. Nevertheless, this study had several limitations. First, there was the potential for non-respondent bias, because of unsuccessfully completed telephone calls and some subjects did not complete the interviews. Potential respondents may find it easier to refuse an interview when contacted by telephone. Second, non-respondents/non-participants in our study may have had different knowledge levels and preventive behaviour patterns than our respondents. Third, the assessment of HBV screening and vaccination was based on self-reporting, which may be inaccurate due to faulty recall or other reasons. For reasons of resource effectiveness and pragmatism however, we had to rely on self-reported data. Fourth, for this questionnaire only content validity and test reliability were established, while there was no testing on construct validity.

This survey revealed gaps in public knowledge about the mode of transmission of HBV. Specifically, less than half of the respondents recognised that sexual contact (44%); sharing a razor or toothbrush (41%); and tattooing or body piercing (37%) could spread the virus. A majority (73%) of respondents mixed up hepatitis A with hepatitis B, and mistakenly believed that eating contaminated seafood was a mode of transmission for hepatitis B. This finding corroborated previous overseas studies, which showed that Chinese immigrants had a general unawareness of HBV transmission through sexual contact and sharing razors or toothbrushes.<sup>15,16</sup> In Hong Kong, most chronic HBV carriers contract the virus through mother-to-infant transmission during the perinatal period. However, it is worth noting that horizontal transmission (especially through sexual contact) may also play an important role in spreading HBV in non-immunised adults.<sup>17</sup>

Surveillance for HCC can improve the survival

of patients with chronic HBV infection.<sup>18</sup> Periodic ultrasonographic monitoring has been recommended for Asian men older than 40 years and Asian women older than 50 years if they are chronic HBV infection carriers.<sup>19</sup> Earlier screening beginning at 30 to 35 years of age or even younger may be adopted in Asian HBV carriers with presumed infection at the time of birth or in early childhood.<sup>20</sup> However, our study revealed that in general, the public lacked knowledge about the need of periodic ultrasonographic examination for HBV carriers.

The most effective means to prevent HBV infection is through vaccination. The protective efficacy of the vaccine is well established.<sup>21-24</sup> The Hong Kong Government initiated routine hepatitis B vaccination for all newborns in 1988. Our study revealed that a majority of the general population in Hong Kong have not yet been protected by hepatitis B vaccination. We demonstrated that HBV screening and vaccination behaviours are associated with the subject's education level and occupation. These

Table 3. Vaccination status for hepatitis B

Characteristics	Vaccinated (n=184)	Not vaccinated (n=281)	P value
Gender			
Male	89 (48%)	129 (46%)	0.586
Age (years)*	38.8 ± 13.8 (18-85)	49.3 ± 15.2 (18-88)	<0.001
Education attainment			<0.001
Primary school or below	10 (5%)	54 (19%)	
Secondary school	86 (47%)	158 (56%)	
University or above	88 (48%)	65 (23%)	
Occupation			<0.001
Executives and professionals	54 (29%)	43 (15%)	
Clerical and service workers	58 (32%)	65 (23%)	
Production workers	8 (4%)	33 (12%)	
Students	19 (10%)	14 (5%)	
Housewives	27 (15%)	55 (20%)	
Others	19 (10%)	71 (25%)	
Marital status			0.001
Married	105 (57%)	203 (72%)	
Single	78 (42%)	70 (25%)	
Divorced	1 (1%)	8 (3%)	
Habitual alcohol consumption	20 (11%)	39 (14%)	0.397
Prior liver function testing	79 (43%)	99 (35%)	0.088
Prior HBV serologic testing	133 (72%)	114 (41%)	<0.001
Family history of HBV carriage	24 (13%)	32 (11%)	0.591

\* Data are shown as mean ± standard deviation (range)

findings are consistent with observations by other researchers with regard to such positive correlations between education level and predictive screening and vaccination.<sup>25,26</sup>

This survey highlights a need to increase the public awareness of HBV infection in Hong Kong. Awareness campaigns should be enhanced to increase the knowledge of the public on HBV infection with emphasis on its mode of transmission and measures to reduce the risk of contracting the virus (practising safe sex and avoidance of sharing injection needles, toothbrushes or shaving razors). The public should be aware of the potential risk when getting a tattoo or body piercing in places where adequate disinfection procedures might not be available or practised. The most effective means of preventing HBV infection is through vaccination. Educational interventions are needed to promote HBV screening and increase vaccination coverage. It is important to develop educational strategies with special attention to persons of lower education levels and lower socio-economic classes, since they may not be aware of the importance of HBV screening and vaccination. To reduce the burden of HBV-related liver disease and its complications, measures should be

taken to ensure that chronically infected individuals are aware of the need of lifelong monitoring and to receipt of antiviral therapy if necessary.

## Appendix

Additional material related to this article can be found on the HKMJ website. Please go to <<http://www.hkmj.org>>, search for the appropriate article, and click on Full Article in PDF following the title.

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## Declaration

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## APPENDIX. Questionnaire

(Multiple answers are allowed for Q3, 6 and 10)

1. Based on your understanding, is Hepatitis A, B, C, D or E the commonest cause of chronic viral hepatitis in Hong Kong?
  - a) Hepatitis A
  - b) Hepatitis B
  - c) Hepatitis C
  - d) Hepatitis D
  - e) Hepatitis E
  - f) Don't know
  
2. What is the estimated prevalence of hepatitis B carriers in Hong Kong?
  - a) <2%
  - b) 2-4%
  - c) 5-7%
  - d) 8-10%
  - e) >10%
  - f) Don't know
  
3. Which of the following will transmit hepatitis B infection?
  - a) Eating contaminated seafood
  - b) Tattoo or body piercing
  - c) Sharing razor or toothbrush
  - d) Blood contact
  - e) Sexual contact
  - f) Mother to infant transmission during childbirth
  - g) Don't know
  
4. Which of the following is the major route of acquiring hepatitis B infection in local hepatitis carriers?
  - a) Eating contaminated seafood
  - b) Tattoo or body piercing
  - c) Sharing needles or other injection instruments
  - d) Transfusion of infected blood products
  - e) Sexual contact
  - f) Mother to infant transmission during childbirth
  - g) Don't know
  
5. Should a hepatitis B carrier mother avoid breastfeeding her baby?
  - a) Yes
  - b) No
  - c) Don't know



6. What are the symptoms of acute hepatitis B?
  - a) Weakness and fatigue
  - b) Loss of appetite
  - c) Nausea and vomiting
  - d) Upper abdominal discomfort
  - e) Tea-coloured urine
  - f) Yellowing of sclera or skin
  - g) Don't know
  
7. Can normal liver function test results exclude the possibility that a person is a hepatitis B carrier?
  - a) Yes
  - b) No
  - c) Don't know
  
8. Do you think an asymptomatic hepatitis B carrier needs periodic liver function test monitoring?
  - a) Yes
  - b) No
  - c) Don't know
  
9. Do you think an asymptomatic hepatitis B carrier needs periodic abdominal ultrasonographic examination?
  - a) Yes
  - b) No
  - c) Don't know
  
10. Which of the following conditions may arise from chronic hepatitis B infection?
  - a) Liver cirrhosis
  - b) Liver cancer
  - c) Liver failure
  - d) Don't know
  
11. (a) Compared with an uninfected individual, do you think the risk of developing liver cancer in a hepatitis B carrier is relatively higher, lower or the same?
  - a) Higher
  - b) The same (Skip to Q12)
  - c) Lower (Skip to Q12)
  - d) Don't know (Skip to Q12)

11. (b) How many times will it be higher? (Only for those respondents who answered "Higher" in Q11a)
  - a) 10 times or below
  - b) 11-25 times
  - c) 26-50 times
  - d) 51-100 times
  - e) Above 100 times
  - f) Don't know
  
12. What is the lifetime risk of a hepatitis B carrier dying from hepatitis B related complications?
  - a) <5%
  - b) 6-10%
  - c) 11-15%
  - d) 16-20%
  - e) >20%
  - f) Don't know
  
13. Have you ever received a hepatitis B vaccine?
  - a) Yes
  - b) No
  - c) Don't know / Can't remember
  
14. Have you ever received a liver function test?
  - a) Yes
  - b) No
  - c) Don't know / Can't remember
  
15. Have you ever received a hepatitis B blood test?
  - a) Yes (Skip to Q17)
  - b) No
  - c) Don't know
  
16. If a blood test shows you are a hepatitis B carrier, will the test results influence your personal planning in the coming few years in the following aspects? (Excluding respondents who answered "Yes" for Q15)
  - i. Travelling abroad
  - ii. Getting married
  - iii. Having a baby
  - iv. Purchase of medical insurance
  - v. Saving a sum of money for medical treatment

*Options for each question*

  - a) Yes
  - b) No
  - c) Don't know

17. What was the result of the hepatitis B blood test? (Only for those respondents who answered "Yes" in Q15)
- a) No evidence of hepatitis B infection
  - b) Hepatitis B carrier
  - c) Immune to hepatitis B
  - d) Don't know the result / Can't recall the result
18. Do you have a habit of alcohol drinking? (habitual alcohol drinker is defined as alcohol drinking more than once a week)
- a) Yes
  - b) No
  - c) Refuse to answer

## Demographic Questions

1. Gender
- a) Male
  - b) Female
2. Age
- a) \_\_\_\_\_ (Input the exact age)
  - b) Refuse to answer
3. Educational attainment
- a) Primary or below
  - b) Secondary school
  - c) Tertiary or above
  - d) Refuse to answer
4. Occupation
- a) Executives and professionals
  - b) Clerical and service workers
  - c) Production workers
  - d) Students
  - e) Housewives
  - f) Others
  - g) Refuse to answer

5. Marital status
  - a) Single
  - b) Married
  - c) Separated/ Divorced/ Widow
  - d) Refuse to answer
  
6. Have you or your family member been diagnosed as a hepatitis B carrier?
  - a) Yes
  - b) No
  - c) Don't know
  
7. Which family member(s) is a hepatitis B carrier? (Only for those respondents who answered "Yes" in Q19)
  - a) Respondent himself / herself
  - b) Parents
  - c) Spouse
  - d) Children
  - e) Siblings
  - f) Cousins
  - g) Uncles/ Aunts
  - h) Nephews or nieces
  - i) Others (Please specify: \_\_\_\_\_)