NHS Grampian Guidance for staff on Blood Borne Virus (BBV) Testing

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- **Organisational:** Operational Management Team and Chief Executive
- **Sector:** General Managers, Medical Leads and Nursing Leads
- **Departmental:** Clinical Leads
- **Area:** Line Manager
- **Review date:** March 2016

**Responsibilities for review of this document:**

- **Lead Author/Co-ordinator:**
  - Ensuring registration of this document on Document and Information Silo
  - Disseminating document as per distribution list
  - Retaining the master copy of this document
  - Reviewing document in advance of review date

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* Changes marked should detail the section(s) of the document that have been amended i.e. page number and section heading.
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NHS Grampian Guidance for staff on Blood Borne Virus (BBV) Testing

1. Introduction
This guidance has been produced jointly by the Health Protection, Infectious Disease (ID), Genitourinary Medicine (GUM), Liver service and Virology departments of NHS Grampian under the auspices of the NHS Grampian Sexual Health and Blood Borne Virus (BBV) managed care network. This guidance updates and supersedes the previous BBV testing guidance for practitioners in Grampian produced by the health protection team in 2011 (HPT 2011). It provides advice on all aspects of blood borne virus (BBV) testing in Grampian.

The BBVs covered in this document are Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and Human Immunodeficiency Virus (HIV).

1.1 Objectives
This guidance aims to provide all NHS Grampian staff involved with people at risk of or living with BBV infections, easily accessible advice on BBV testing based on national guidelines including:
- Who should be offered a BBV test
- Who can request a BBV test
- What BBV test to offer and when
- How to interpret a BBV result
- When and where to refer individuals with a BBV infection for treatment, care and support

This guidance will be reviewed every two years, or when necessary, to take into account new research evidence and changes in national guidance.

1.2 Background
Improvements in the treatment of Blood Borne Virus (BBVs) infections i.e. Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and Human Immunodeficiency Virus (HIV) have significantly reduced morbidity, mortality and transmission of these diseases over recent years. However, it is estimated that a significant number of individuals infected with these viruses are unaware of their infection. For any individual living with a BBV to fully benefit
from treatment, care and support they need to be aware of their infection. This requires diagnostic testing.

**Hepatitis B**

Each year around 50 cases of hepatitis B virus (HBV) infection are diagnosed in Grampian; most are newly diagnosed chronic infections with only a few recent (acute) infections. The majority of hepatitis B infections are in individuals from high prevalence countries, including Asia, sub-Saharan Africa and Eastern Europe or men who have sex with men (MSM) and people who inject drugs (PWID). Infection of an adult with HBV results in an acute self limiting disease in the majority of cases. Only about 5% of immunocompetent patients and 40% of immunocompromised patients develop chronic infection. Cirrhosis or cancer of the liver may develop in up to 20% of chronic carriers over 10-50 years (Gilson 2006). There is no cure for HBV infection but available treatment is effective in suppressing viral replication and halting the progress to severe liver damage in those infected. There is an effective vaccine against HBV infection.

**Hepatitis C**

In Scotland, it is estimated that approximately 1% of the population are infected with HCV. The majority of HCV infections are diagnosed in injecting drug users (previous and current injectors) and it is estimated that over half of those infected are unaware of their infection. Most (70-80%) individuals develop chronic HCV and it is estimated that more than 20% will develop cirrhosis and liver cancer over the next 10-50 years if left untreated. There is no vaccine available for HCV infection. However treatment is effective, leading to complete eradication of the virus in the majority of individuals who receive antiviral therapy.

**HIV**

About 1 in 4 (25%) of those infected with HIV in the UK are unaware of their infection and late diagnosis is associated with significant HIV morbidity and mortality (HPA 2012). Testing with early diagnosis of HIV infection means that infected people can access effective treatment early and prevent onward transmission of HIV. A UK-wide audit in 2006 and a review of deaths in Aberdeen in 2008 found that late diagnosis was a major cause of death in people infected with HIV. Many of those infected with HIV present with various health problems before they are eventually diagnosed. Each of these episodes represents a missed opportunity for earlier diagnosis. Typical symptoms could include chronic
diarrhoea; repeated episodes of bacterial pneumonia or pyrexia of unknown origin. See appendix 2 [page 15] for a full list of HIV indicator conditions.

1.3 **Groups to which this document applies**
The guidance is aimed at and applies to all staff that work with people at risk of or living with a BBV infection including:

- General Practitioners
- Hospital Medical staff
- Accident & Emergency department staff
- Infectious Disease Consultants
- Consultants in Public Health Medicine
- GMed staff
- Health Protection Nurses
- Nurses and Midwives
- Substance Misuse Service staff
- Third sector organisations and Local Authority staff providing BBV testing on behalf of NHS Grampian including early intervention and social workers.

1.4 **Groups to which this document does not apply**
The guidance does not provide advice on testing for occupational health issues or clinical management of BBV cases. Separate guidelines exist for the management of HBV, HCV and HIV (BHIVA 2012, NICE 2013, SIGN 2013). For occupational health issues please visit [http://gohealthservices.com](http://gohealthservices.com)
2. Evidence Base - BBV Testing Recommendations

Current guidelines and standards produced by Healthcare Improvement Scotland (HIS), the British HIV Association (BHIVA), the British Association for Sexual Health and HIV (BASHH), the British Infection Society (BIS) and Scottish Intercollegiate Guidelines Network recommend increased testing as the way to reduce late diagnosis and reducing the risk of transmission of BBVs.

2.1 Hepatitis B

It is recommended that Hepatitis B testing should be offered to:

- People born or who have lived in a country of high prevalence*, predominantly, Asia, Eastern Europe, Africa and the Caribbean
- MSM who are not already fully immunised against HBV
- Everyone who has been diagnosed with HIV or HCV infection
- People who may have had unsterile medical treatment abroad, or treatment in countries where infection control procedures are sub-standard
- People who may have had unsterile body piercing or tattoos
- Those who are being investigated for unexplained persistently abnormal aminotransferases (not raised alkaline phosphatise, bilirubin or gamma glutamyl transferase)
- Anyone who has EVER injected drugs
- The sexual partners and close contacts of those diagnosed with hepatitis B
- Pregnant women in each pregnancy
- Children of women known to be infected with HBV
- Patients requiring immunosuppressive therapy including biological treatments and antineoplastic chemotherapy

*see appendix 13 [page 29]
2.2 Hepatitis C

The Royal College of General Practitioners and Scottish Intercollegiate Guidelines Network recommend that HCV testing should be offered to:

- Anyone who has EVER injected drugs
- People born or who have lived in a country of high prevalence*, predominantly, Asia, Eastern Europe and Africa
- Everyone who has been diagnosed with HIV or HBV
- People who may have had unsterile medical treatment abroad, or treatment in countries where infection control procedures are sub-standard
- People who may have had unsterile body piercing or tattoos
- Those who are being investigated for unexplained persistently abnormal aminotransferases (not raised alkaline phosphatise, bilirubin or gamma glutamyl transferase)
- The sexual partners and close contacts of those diagnosed with HCV
- MSM where the sexual activity can lead to trauma and bleeding
- Pregnant women, if other risk factors such as injecting drug use (IDU) are present
- Children of women known to be HCV RNA positive

*see appendix 13 [page 29]
2.3 HIV

Current guidelines and standards produced by Health Improvement Scotland (HIS), the British HIV Association (BHIVA), the British Association for Sexual Health and HIV (BASHH) and the British Infection Society (BIS) recommend increased testing as a way to reduce late diagnosis and reduce the risk of transmission. These guideline documents recommend that:

1. Where the prevalence of diagnosed HIV infections is greater than 2 in 1,000, HIV testing should be offered to all individuals aged 15-59 registering in general practice as well as to all general medical admissions.

2. HIV test should be universally offered in each of the following settings:
   - Genitourinary medicine (GUM) or sexual health clinics;
   - Antenatal services in every pregnancy
   - Termination of pregnancy services;
   - Drug dependency programmes;
   - Healthcare services for those diagnosed with any of tuberculosis, HBV, HCV and lymphoma.

3. HIV testing should be also offered and recommended as part of routine care to the following patients:
   - Any patient presenting for healthcare where HIV, including primary infection, enters the differential diagnosis;
   - All men and women diagnosed with a sexually transmitted infection;
   - All sexual partners of HIV-infected men and women;
   - All men that have sexual contact with other men;
   - All female sexual contacts of MSM
   - All patients reporting a history of IDU;
   - All men and women known to be from a country of high HIV prevalence (>1%) see appendix 12 [page 27];
   - All men and women who report sexual contact abroad or in the UK with individuals from countries of high HIV prevalence

4. For the following, testing is in accordance with existing Department of Health guidance:
   - Blood donors,
   - Dialysis patients,
   - Organ transplant donors and recipients,
   - All patients requiring immunosuppressant therapy.
3 BBV Testing

3.1 Who should be tested for BBVs?
NHS Grampian recommends that the following categories of individuals should be offered BBV testing:

- Anyone who requests a BBV test
- Anyone who is from an area of high prevalence for any BBV (HBV, HCV, HIV)
- Anyone who reports risk behaviour or anyone with a clinical presentation or condition that could be associated with a BBV (HIV, HBV, HCV)
- All new prison inmates admitted to HMP Grampian
- All new patients registering at a GP surgery who have been born, raised or otherwise resident in a country of high BBV prevalence, including all returning travellers who have had sexual contacts in these countries.

It is recommended and is good practice to consider testing for all three infections whenever faced with an individual at risk of any BBV. This is because HBV, HCV and HIV all share similar risk factors and similar modes of transmission. Furthermore, infection with more than one of the viruses can have significant impact on the clinical course and management of the individual infections. In addition to these, the treatment guidelines differ in HIV or hepatitis mono and co-infected populations (BHIVA 2013). A summary of who should be tested and what test to request is presented in appendix 3 (page 16).

3.2 Who can request a BBV test?
All doctors, midwives, nurses and trained healthcare workers in specialist and non-specialist settings in NHS Grampian including those working in an accident and emergency department or general practice should be able to arrange and consent a patient for a BBV test.

It is no longer necessary to have a lengthy pre-test discussion. A BBV test should be regarded the same as any other test where the result could influence the patient's management and informed consent for BBV test should be obtained in the same way that is currently done for any other medical investigation.

The BHIVA/BASHH UK guidelines for HIV recommend that when discussing HIV testing with a patient, the main issue to cover is the benefit of having a test and how the test results will be given.
A typical dialogue might be: “So that we can find out what’s going on and decide the best treatment for you, we need to do some investigations. We’ll do an X-ray of your chest and take some blood to check your liver and kidneys plus look for some viral infections including hepatitis and HIV. Do you have any questions or is that OK?”

“It is important that blood borne virus testing and related services are provided in a culturally sensitive way. Otherwise, patients at high risk and their families may be deterred from accessing the services available.”

3.3 Window period

A window period is the time from exposure to the infection to a positive test. During this period the normal serological response cannot be detected by the usual testing methods. All BBVs have a window period. It is important to establish whether the person being tested could be in the window period, or has been at risk of exposure to infection during the window period for each virus. If tested during the window period, they should be offered re-testing, if initial tests are negative, after the appropriate window period. The table below shows the window period:

<table>
<thead>
<tr>
<th></th>
<th>HCV</th>
<th>HBV</th>
<th>HIV</th>
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<tbody>
<tr>
<td>Window period</td>
<td>up to 6 months</td>
<td>up to 6 months</td>
<td>up to 3 months</td>
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3.4 Virology request

All samples should be sent to the Virology Laboratory where a full diagnostic virology service is available between the hours of 08:30-17:00 Monday to Friday. A limited service is available out of hours. Where samples are required to be tested urgently, please contact the Virus Laboratory on 01224 552452 (or if not available, the duty Microbiologist available via ARI switchboard, 08454566000).

The Virology laboratory assumes that consent for BBV testing has been obtained when an electronic or printed request specifying a BBV test is received in the laboratory.

Any request for BBV testing of a sample already in the laboratory must be discussed with Virus Laboratory staff 08:30-17:00 Monday to Friday on 01224 552452 and outwith these times with the duty Microbiologist available via ARI switchboard, 08454566000.
3.5 Methods of BBV testing
The preferred and recommended method for BBV testing is a venous blood sample because this is universally available and is the most cost effective. Other methods of testing include Dried Blood Spot (DBS) Testing or point of care tests (POCT).

3.5.1 Venous blood testing
Venous blood is ideal for BBV testing and is the preferred method for testing in Grampian. Send one purple top 10 ml EDTA tube (if available). For all samples for BBV testing, the following information should be provided on the request form:

- Patient’s name, surname, CHI number OR patient anonymous code
- Name of requesting clinician
- Date & time specimen taken
- BBV tests requested
- Clinical indication for BBV test

3.5.2 Dried Blood Spot (DBS) testing
DBS testing removes the need for venepuncture and is most suitable for patients with damaged peripheral veins, including those with a history of IDU or poor venous access.

3.5.3 Point of Care Tests (POCT)
A POCT only tests for a single pathogen and is therefore best used in selected outreach settings. It is not used routinely for testing or screening but there may be a place for POCT in delivery suites where pregnant women present to a formal healthcare facility in labour. POCT are not currently available in Grampian.

3.6 How often to test?
Repeat testing is recommended for the following:

- an individual who has tested HIV negative but where a possible exposure has occurred within the window period
- MSM should be tested annually for HBV (if not immune), HCV and HIV
- PWID should be tested annually for HBV (if not immune), HCV and HIV or sooner if clinical symptoms are suggestive of a BBV
- Pregnant women who refuse BBV testing at antenatal booking should be re-offered testing around 28-32 weeks and again at 36 weeks. Women presenting to services for the first time in labour (e.g. women who have not engaged with routine antenatal care,
migrants) should be offered testing. Any test sample obtained after 24 weeks should be marked URGENT and a telephone call made to advise the lab. Results should be available within 24 hours of receipt of the specimen by the laboratory to allow immediate referral to the relevant specialist service for further assessment if results are positive. For tests done out of hours, including weekends and public holidays please telephone labs to advise.

To contact the laboratory during office hours (8.30am-5pm), please call 01224 552452. To contact the laboratory at any other time, please contact the on call microbiologist, via the ARI switchboard, on 0845 456 6000.

Testing should also be considered for the infant of a woman who has refused testing antenatally.

3.7 BBV Test Results: Interpretations
All positive HBsAg and HCV RNA results should be notified by the laboratory to the Health Protection Team, when available in line with national public health legislation (Public Health (Scotland) Act 2008).

3.7.1 Post-test discussion and giving result of a BBV test
The result of any BBV test is best given to the patient face-to-face. In some situations and where such protocols exist, the result may be given by telephone. In all cases, whether the result was negative or positive, the post-test discussion should cover the following:

- An explanation of the test result and whether re-testing is required
- Addressing any concerns or queries the patient might have regarding the test result
- A discussion regarding harm/risk reduction e.g. the use of condoms, use of sterile injecting equipment
- A discussion regarding HBV immunisation
- A discussion around the need for contact tracing where this is required
- A discussion around referral to a specialist for further investigation, treatment and care
- Signposting to community services providing support for BBVs

It is very important to let the patient who has tested negative for HBV, HCV or HIV know that this result does not mean immunity from infection. Nor does it mean that the patient is not engaging in activities that continue to put him or her at risk. For patients who continue to engage in risky behaviour, it is important to identify barriers to risk reduction and to give
information about steps patients can take to minimise or eliminate possible exposure to HBV, HCV and HIV. The healthcare provider should emphasise the importance of being re-tested if the patient has engaged in at risk behaviours during the “window period”.

According to the 2010 BASHH statement on window period (BASHH 2010), ‘Patients attending for HIV testing who identify a specific risk occurring more that 4 weeks previously, should not be made to wait 3 months (12 weeks) before HIV testing. They should be offered a 4th generation laboratory HIV test and advised that a negative result at 4 weeks post exposure is very reassuring/highly likely to exclude HIV infection’. NHS Grampian Virology Laboratory use 4th general HIV test kits. These kits detect HIV-1 and HIV-2 antibodies and HIV-1 p24 antigen.

3.7.2 Interpretation of results
Please see appendices 4 [page 18], 5 [page 19] & 6 [page 20] for interpretation of HBV, HCV and HIV serology results and further actions and appendix 7 [page 21] & 8 [page 23] for summary of tests and testing flow chart respectively.

3.8 Referral to specialist clinical* and community support services

*See appendix 10 [page 25] for information and contact numbers for specialist clinical services.
4 References


British HIV Association (BHIVA) 2013 Guidelines for the management of coinfection with HIV-1 and hepatitis B or C virus http://www.bhiva.org/hepatitis-2013.aspx


Health Protection Agency 2011: Areas where wider HIV testing policies should be considered. Health Protection Agency Centre for Infections http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1221638181581


Health Protection Team, November 2011. Who should be tested for Blood Borne Viruses (BBVs)? Testing Guidance for Practitioners in Grampian


Scottish Government 2008: Public Health etc. (Scotland) Act 2008 available online at http://www.ifrc.org/docs/idrl/674EN.pdf


5 Distribution list
- General Practitioners
- Hospital Medical staff
- Accident & Emergency department staff
- GMed staff
- GUM consultants
- Infectious Disease Consultants
- Consultants in Public Health Medicine
- Health Protection Nurses
- Nurses and Midwives
- 3rd Sector / Voluntary Organisations providing BBV testing on behalf of NHS Grampian
### Appendices

#### Appendix 1: Abbreviations

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<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>A&amp;E</td>
<td>Accident and Emergency</td>
</tr>
<tr>
<td>Anti-HBc</td>
<td>Hepatitis B anti-core antibody</td>
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<tr>
<td>Anti-HBs</td>
<td>Hepatitis B anti-surface antibody</td>
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<tr>
<td>ARI</td>
<td>Aberdeen Royal Infirmary</td>
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<td>BASHH</td>
<td>British Society for Sexual Health and HIV</td>
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<td>BBV</td>
<td>Blood Borne Virus</td>
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<td>BHIVA</td>
<td>British HIV Association</td>
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<td>BIS</td>
<td>British Infection Society</td>
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<td>CHI</td>
<td>Community Health Index</td>
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<tr>
<td>DBS</td>
<td>Dry Blood Spot</td>
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<td>GP</td>
<td>General Practice</td>
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<td>GUM</td>
<td>Genitourinary Medicine</td>
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<td>HBsAg</td>
<td>Hepatitis B surface antigen</td>
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<td>Hepatitis B virus</td>
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<td>Hepatitis C virus</td>
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<td>HIV</td>
<td>Human Immunodeficiency virus</td>
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<tr>
<td>IDU</td>
<td>Injecting Drug Use</td>
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<td>INFU</td>
<td>Infection Unit</td>
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<td>MSM</td>
<td>Men who have sex with men</td>
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<td>OH</td>
<td>Occupational Health</td>
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<td>PCR</td>
<td>Polymerase chain reaction</td>
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<td>PWID</td>
<td>Person Who Injects Drugs</td>
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<td>RNA</td>
<td>Ribonucleic acid</td>
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<td>Appendix 2: Clinical indicator diseases for adult HIV infection</td>
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<td><strong>AIDS-defining conditions</strong></td>
<td><strong>Other conditions where HIV testing should be offered</strong></td>
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<tr>
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<tr>
<td>• Tuberculosis</td>
<td>• Bacterial pneumonia</td>
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<td>• Aspergillosis</td>
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<td><strong>Neurology</strong></td>
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<tr>
<td>• Cerebral toxoplasmosis</td>
<td>• Aseptic meningitis/encephalitis</td>
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<td>• Primary cerebral lymphoma</td>
<td>• Cerebral abscess</td>
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<td>• Cryptococcus meningitis</td>
<td>• Space occupying lesion of unknown cause</td>
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<td>• Progressive multifocal leucoencephalopathy</td>
<td>• Guillain-Barre syndrome</td>
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<td>• Peripheral neuropathy</td>
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<td>• Dementia</td>
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<td>• Leucoencephalopathy</td>
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<tr>
<td></td>
<td>• Castleman’s disease</td>
</tr>
<tr>
<td><strong>Gynaecology</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cervical cancer</td>
</tr>
<tr>
<td></td>
<td>• Vaginal intraepithelial neoplasia</td>
</tr>
<tr>
<td></td>
<td>• Cervical intraepithelial neoplasia Grade 2 or above</td>
</tr>
<tr>
<td><strong>Haematology</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Any unexplained blood dyscrasias including:</td>
</tr>
<tr>
<td></td>
<td>• Thrombocytopenia</td>
</tr>
<tr>
<td></td>
<td>• Neutropenia</td>
</tr>
<tr>
<td></td>
<td>• Lymphopenia</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>Cytomegalovirus retinitis</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>ENT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: BHIVA, BASHH, Bis (2008) UK National Guidelines for HIV testing
Appendix 3: Summary of individuals who should be offered testing and type of test to request

| Table 1: Summary of individuals who should be offered testing and type of test required |
|-----------------------------------|-----------------|-----------------|-----------------|
| **Lifestyle/behaviours**          | HCV antibody    | HBV             | HIV             |
| Any individuals with a history of current or past injecting drug use | ✓               | core antibody*  | ✓               |
| Individuals who change sexual partners frequently, including men who have sex with men (MSM) and their female contacts; and male or female commercial sex workers | ✓ if risk factor (e.g. traumatic anal sex) | core antibody | ✓               |
| Individuals with sexual contact abroad or with individuals from high prevalence countries | -               | core antibody*  | ✓               |
| **Community/workplace contacts** |                 |                 |                 |
| Individuals with tattoos or other body piercing procedures, where infection control may have been inadequate | ✓               | surface antigen | ✓               |
| Close contacts (e.g. family, household, injecting partners) of HBV infected individuals; support for this is available from the Health Protection Team 01224- 558520 | -               | surface antigen & core antibody | -               |
| Individuals not immunised against HBV as infants, whose parent(s) were born in areas of high HBV prevalence | -               | surface antigen | -               |
| Individuals born or coming from a high or intermediate HCV/HBV/HIV endemic area | ✓               | core antibody*  | ✓               |
| Individuals with a current or past sexual partner who is HCV/HBV/HIV positive | ✓               | core antibody*  | ✓               |
| Children (more than 12-15 months old) born to HCV/HBV/HIV positive mother (virus-specific testing advised) | ✓               | surface antigen | ✓               |
### Health issues

<table>
<thead>
<tr>
<th>Health issue</th>
<th>Test Offered</th>
<th>Test Requested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals diagnosed with HCV/HBV/HIV (all 3 to be offered at baseline, when any of 3 is positive)</td>
<td>✓</td>
<td>core antibody</td>
</tr>
<tr>
<td>Individuals diagnosed with a sexually transmitted infection</td>
<td>-</td>
<td>consider core antibody**</td>
</tr>
<tr>
<td>Individuals with an unexplained persistently elevated aminotransferase or jaundice</td>
<td>✓</td>
<td>surface antigen</td>
</tr>
<tr>
<td>Individuals with selected diagnoses linked to immunosuppressed health states</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Individuals requiring immunosuppressive therapy (including biologics)</td>
<td>-</td>
<td>core antibody</td>
</tr>
<tr>
<td>Pregnant women, through antenatal screening or not</td>
<td>✓ if risk factor</td>
<td>surface antigen</td>
</tr>
</tbody>
</table>

### Healthcare issues

<table>
<thead>
<tr>
<th>Healthcare issue</th>
<th>Test Offered</th>
<th>Test Requested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals receiving dialysis</td>
<td>✓</td>
<td>surface antigen</td>
</tr>
<tr>
<td>UK recipients of blood products (pre-1986), blood (pre-1991), organ/tissue transplant (pre-1992)</td>
<td>✓</td>
<td>surface antigen</td>
</tr>
<tr>
<td>Individuals who have received medical or dental treatment where infection control is, or is suspected to be, inadequate, particularly in countries where BBV prevalence is moderate or high</td>
<td>✓</td>
<td>surface antigen</td>
</tr>
<tr>
<td>Blood and/or tissue donors</td>
<td>✓</td>
<td>surface antigen</td>
</tr>
</tbody>
</table>

* Individual should be immunised if susceptible otherwise request surface antigen only
** Unless previously fully immunised and demonstrating a satisfactory HBsAb response
### Appendix 4: Interpretation of HBV serologic test results and further actions

<table>
<thead>
<tr>
<th>HEP B SEROLOGIC TEST</th>
<th>RESULT</th>
<th>INTERPRETATION</th>
<th>FURTHER ACTIONS</th>
</tr>
</thead>
</table>
| HBsAg anti-HBc anti-HBs | negative negative | Non immune. Patient is susceptible to HBV infection | - Offer HBV immunisation if at ongoing risk of exposure  
- BBV prevention advice  
- Offer advice on risk reduction  
- Offer HIV and HCV testing if ongoing risk |
| HBsAg anti-HBc anti-HBs | negative positive positive | Indicates past exposure to HBV. Immune due to natural infection. | - No further action regarding HBV unless individual becomes immunocompromised or develop unexplained elevated aminotransferases  
- Offer testing for HCV and HIV |
| HBsAg anti-HBc anti-HBs | negative negative positive | Indicates previous HBV immunisation. Immune due to HBV immunisation | - No further action.  
- Offer HCV and HIV testing if at risk |
| HBsAg anti-HBc IgM anti-HBc anti-HBs | positive positive negative | Acutely infected (or rarely acute exacerbation of chronic HBV infection) | - Harm reduction advice  
- Contact tracing and immunisation of household and sexual contacts  
- Offer HCV and HIV testing  
- Discuss with Infection Unit |
| HBsAg anti-HBc IgM anti-HBc anti-HBs | positive positive negative | Chronic HBV infection | - Refer to Liver Service for further care  
- Offer HCV and HIV testing |
| HBsAg anti-HBc anti-HBs | negative positive negative | Four possibilities:  
1. Resolved infection (most common)  
2. False-positive anti-HBc, thus susceptible  
3. “Low level” chronic infection  
4. Resolving acute infection | - Discuss with Virus Laboratory  
- Repeat test |
## Appendix 5: Interpretation of results of tests for HCV infection and further actions

<table>
<thead>
<tr>
<th>TEST OUTCOME</th>
<th>INTERPRETATION</th>
<th>FURTHER ACTIONS</th>
</tr>
</thead>
</table>
| HCV antibody non reactive/negative        | No HCV antibody detected            | • No further action required  
• BBV prevention advice  
• If recent exposure is suspected, repeat HCV antibody test after 6 months*.  
• Offer advice on risk reduction  
• Offer HBV and HIV testing if ongoing risk |
| HCV antibody reactive/positive             | Presumptive HCV infection           | • A repeatedly reactive result is consistent with: 
  ✓ Current HCV infection  
  ✓ Past HCV infection that has resolved 
  ✓ Biologic false positivity for HCV antibody.  
• Test for HCV RNA (by PCR) to identify current infection. |
| HCV antibody reactive/positive PLUS       | Current HCV infection               | • Provide person tested with appropriate counselling  
• Offer testing for HBV and HIV if not done  
• Refer to Liver Services for further care and treatment. |
| HCV antibody reactive/positive PLUS       | No current HCV infection            | • Repeat HCV RNA after 6 months, if negative no further action required in most cases.  
• In certain situations, particularly where there is ongoing risk, follow up with HCV RNA testing and appropriate counselling.  
• Offer testing for HBV and HIV if not done |

*Where a HCW is exposed to a known HCV RNA positive source test for HCV RNA.
### Appendix 6: Interpretation of HIV test results

<table>
<thead>
<tr>
<th>TEST OUTCOME</th>
<th>INTERPRETATION</th>
<th>FURTHER ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>Susceptible to HIV infection</td>
<td>• Repeat test if in ‘window period’ or ongoing risk behaviour</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Offer advice on risk reduction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Offer HBV and HCV testing if ongoing risk</td>
</tr>
<tr>
<td>Positive</td>
<td>Ongoing HIV infection</td>
<td>• Offer infection prevention and harm reduction advice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Offer HBV and HCV testing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Refer to Infection Unit or GUM for treatment and monitoring, sexual health</td>
</tr>
<tr>
<td></td>
<td></td>
<td>screening and contact tracing</td>
</tr>
</tbody>
</table>
### Appendix 7: Summary of BBV tests, when to request and interpretation of results

<table>
<thead>
<tr>
<th>Type of BBV Test</th>
<th>When to request</th>
<th>Interpretation of result and further test</th>
</tr>
</thead>
</table>
| **Hepatitis C antibody** | Baseline test to assess ongoing or past HCV infection. | • Positive indicates exposure to HCV at some time.  
• HCV RNA (by PCR) testing differentiates these:  
  ✓ RNA positive indicates ongoing infection  
  ✓ RNA negative indicates past/resolved infection  
• If past infection, individual is susceptible to re-infection as antibody is not protective. |
| **HCV RNA** | Specialist test (using polymerase chain reaction, PCR) to amplify HCV ribonucleic acid (RNA) when HCV antibody is positive. Used to:  
✓ confirm chronic infection  
✓ monitor HCV treatment  
✓ Occasionally to test for infection in immuno-compromised patients (as unable to make antibody). | Positive Indicates ongoing HCV infection. |
| **Hepatitis B core antibody (HBcAb, anti-HB core) antibody to HBV core antigen** | Baseline HBV screening test for ongoing and past infection, generally used for well patients who, if at continued risk of exposure and susceptible (core antibody negative), should be offered HBV immunisation. If HBcAb positive, lab does further relevant testing automatically to establish current infection status. | • Positive indicates exposure to HBV at some time in past.  
• HBsAg testing differentiates these:  
  ✓ HBsAg positive indicates ongoing infection  
  ✓ HBsAg negative indicates past/resolved infection. |
<p>| <strong>Hepatitis B surface antigen (HBsAg)</strong> | Baseline diagnostic HBV test, generally used for unwell patients, e.g. those with jaundice or unexplained elevated aminotransferases and for selected HBV screening (e.g. occupational, antenatal). Also used if HBcAb is positive to ascertain ongoing HBV infection, see above. | A positive HBsAg indicates ongoing infection and transmissibility. |</p>
<table>
<thead>
<tr>
<th>Test Description</th>
<th>Purpose</th>
<th>Result Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>hepatitis B IgM core antibody (HBcIgM, IgM anti HBc)</td>
<td>Specialist test for HBV added by laboratory staff only when HBsAg or core antibody is positive to assess acuteness of HBV infection.</td>
<td>If strongly positive, usually indicative of HBV exposure within the previous three months i.e. acute HBV infection. (Rarely can indicate acute exacerbation of chronic infection).</td>
</tr>
<tr>
<td>hepatitis B e antigen (HBeAg)</td>
<td>Specialist test for HBV added by laboratory staff only when HBsAg is positive. Also used for chronic HBV patients attending specialist care</td>
<td>A positive result indicates high HBV transmissibility.</td>
</tr>
<tr>
<td>hepatitis B e antibody (HBeAb) antibody to HBV e antigen</td>
<td>Specialist test for HBV added by laboratory staff usually when HBsAg is positive.</td>
<td>A positive result usually indicates lower risk of HBV transmissibility (unless mutant virus present).</td>
</tr>
<tr>
<td>hepatitis B DNA (HBV DNA)</td>
<td>Used to assess clinical staging and to monitor response to treatment for chronic HBV patients attending specialist care.</td>
<td>A positive result correlates with active HBV replication.</td>
</tr>
<tr>
<td>hepatitis B surface antibody (HBsAb) antibody to HBV surface antigen</td>
<td>Non-routine test. Used to assess response to immunisation. Only needed in selected groups (e.g. healthcare workers, immuno-compromised patients, renal dialysis patients). See <a href="https://www.gov.uk/government/publications/hepatitis-b-the-green-book-chapter-18">https://www.gov.uk/government/publications/hepatitis-b-the-green-book-chapter-18</a></td>
<td>A positive result usually indicates HBV immunity as a result of past infection or active immunisation.</td>
</tr>
<tr>
<td>HIV types 1 and 2 Combined HIV antigen and antibody to HIV 1 and HIV 2</td>
<td>Baseline screening and diagnostic test for HIV. When positive, the laboratory arranges appropriate specialist confirmatory tests.</td>
<td>A positive result indicates ongoing infection with HIV.</td>
</tr>
</tbody>
</table>
### Appendix 9: HIV support services in Grampian - 3rd Sector Agencies

<table>
<thead>
<tr>
<th>Service</th>
<th>Address</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drugs Action</strong></td>
<td>7 Hadden Street, Aberdeen, AB11 6NN</td>
<td>01224 577120</td>
</tr>
<tr>
<td><strong>GMH</strong></td>
<td>246 George Street, Aberdeen, AB25 1HN</td>
<td>01224 930355</td>
</tr>
<tr>
<td><strong>Turning Point Scotland Northern Horizons</strong></td>
<td>Chalmers Hospital, Banff, AB45 1JA</td>
<td>01779 470490 (Peterhead office)</td>
</tr>
<tr>
<td><strong>Turning Point Scotland Northern Horizons</strong></td>
<td>9 St Peter Street, Peterhead, AB42 1QB</td>
<td>01779 470490</td>
</tr>
<tr>
<td><strong>Turning Point Scotland Studio 8</strong></td>
<td>73 High Street, Elgin, IV30 1EE</td>
<td>01343 543792</td>
</tr>
<tr>
<td><strong>Terence Higgins Trust</strong></td>
<td>c/o GMH, 246 George Street, Aberdeen, AB25 1HN</td>
<td>0845 241 2151</td>
</tr>
<tr>
<td><strong>Waverley Care</strong></td>
<td>c/o GMH, 246 George Street, Aberdeen, AB25 1HN</td>
<td>0845 241 2151</td>
</tr>
</tbody>
</table>
# Appendix 10: Specialist Services and Laboratory Information

<table>
<thead>
<tr>
<th>Specialist Service</th>
<th>Contact Address</th>
<th>Day time contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infectious Diseases</td>
<td>Infection Unit, Ward 111, Aberdeen Royal Infirmary, Foresterhill, Aberdeen, AB25 2ZN</td>
<td>0845 456 6000</td>
</tr>
<tr>
<td>Liver Service</td>
<td>Peter Brunt Clinic, Aberdeen Royal Infirmary, Foresterhill, Aberdeen, AB25 2ZN</td>
<td>01224 559988</td>
</tr>
<tr>
<td>GUM</td>
<td>Woolmanhill Hospital, Skene Street, Aberdeen, AB25 1LD</td>
<td>0845 337 9900</td>
</tr>
<tr>
<td>Paediatric HIV services</td>
<td>Royal Aberdeen Children's Hospital, Westburn Road, Foresterhill, Aberdeen, AB25 2ZG</td>
<td>0845 456 6000</td>
</tr>
<tr>
<td>Virology Laboratory</td>
<td>Virology Laboratory, Department of Medical Microbiology, Aberdeen Royal Infirmary, Foresterhill, Aberdeen, AB25 2ZN</td>
<td>01224 552452</td>
</tr>
<tr>
<td>Health Protection</td>
<td>Summerfield House, 2 Eday Road, AB15 6RE</td>
<td>01224 558520</td>
</tr>
<tr>
<td>Out of Hour service*</td>
<td>Via ARI Switchboard</td>
<td>0845 456 6000</td>
</tr>
</tbody>
</table>

*All services can be contacted via ARI switchboard out of hours*
Appendix 11: Other useful Information

For further information about ongoing work in Grampian related to HIV, HBV or HCV, please contact the Sexual Health and BBV Managed Care Network (MCN) at: 5585221
### Appendix 12: Prevalence (%) of HIV in adults aged 15-49 years by country, 2011 (High risk countries in bold)

<table>
<thead>
<tr>
<th>Country</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Algeria</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Angola</td>
<td>2.1</td>
</tr>
<tr>
<td>Argentina</td>
<td>0.4</td>
</tr>
<tr>
<td>Armenia</td>
<td>0.2</td>
</tr>
<tr>
<td>Australia</td>
<td>0.2</td>
</tr>
<tr>
<td>Austria</td>
<td>0.4</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>0.1</td>
</tr>
<tr>
<td>Bahamas</td>
<td>2.8</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Barbados</td>
<td>0.9</td>
</tr>
<tr>
<td>Belarus</td>
<td>0.4</td>
</tr>
<tr>
<td>Belgium</td>
<td>0.3</td>
</tr>
<tr>
<td>Belize</td>
<td>2.3</td>
</tr>
<tr>
<td>Benin</td>
<td>1.2</td>
</tr>
<tr>
<td>Bhutan</td>
<td>0.3</td>
</tr>
<tr>
<td>Bolivia</td>
<td>0.3</td>
</tr>
<tr>
<td>Botswana</td>
<td>23.4</td>
</tr>
<tr>
<td>Brazil</td>
<td>0.3</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0.1</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>1.1</td>
</tr>
<tr>
<td>Burundi</td>
<td>1.3</td>
</tr>
<tr>
<td>Cote d'Ivoire</td>
<td>3.0</td>
</tr>
<tr>
<td>Finland</td>
<td>0.1</td>
</tr>
<tr>
<td>France</td>
<td>0.4</td>
</tr>
<tr>
<td>Gabon</td>
<td>5.0</td>
</tr>
<tr>
<td>Gambia</td>
<td>1.5</td>
</tr>
<tr>
<td>Georgia</td>
<td>0.2</td>
</tr>
<tr>
<td>Germany</td>
<td>0.2</td>
</tr>
<tr>
<td>Ghana</td>
<td>1.5</td>
</tr>
<tr>
<td>Greece</td>
<td>0.2</td>
</tr>
<tr>
<td>Guatemala</td>
<td>0.8 (3.5)*</td>
</tr>
<tr>
<td>Guinea</td>
<td>1.4</td>
</tr>
<tr>
<td>Guinea-Bissau</td>
<td>2.5</td>
</tr>
<tr>
<td>Guyana</td>
<td>1.1</td>
</tr>
<tr>
<td>Haiti</td>
<td>1.8</td>
</tr>
<tr>
<td>Honduras</td>
<td>...(0.5-0.9)</td>
</tr>
<tr>
<td>Hungary</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Iceland</td>
<td>0.3</td>
</tr>
<tr>
<td>India</td>
<td>...</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.3</td>
</tr>
<tr>
<td>Iran (Islamic Republic of)</td>
<td>0.2</td>
</tr>
<tr>
<td>Ireland</td>
<td>0.3</td>
</tr>
<tr>
<td>Israel</td>
<td>0.2</td>
</tr>
<tr>
<td>Italy</td>
<td>0.4</td>
</tr>
<tr>
<td>Jamaica</td>
<td>1.8</td>
</tr>
<tr>
<td>Niger</td>
<td>0.8</td>
</tr>
<tr>
<td>Nigeria</td>
<td>3.7</td>
</tr>
<tr>
<td>Norway</td>
<td>0.2</td>
</tr>
<tr>
<td>Oman</td>
<td>...</td>
</tr>
<tr>
<td>Pakistan</td>
<td>0.1</td>
</tr>
<tr>
<td>Panama</td>
<td>0.8 (1.3)*</td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>0.7</td>
</tr>
<tr>
<td>Paraguay</td>
<td>0.3</td>
</tr>
<tr>
<td>Peru</td>
<td>0.4 (1.1)*</td>
</tr>
<tr>
<td>Philippines</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Poland</td>
<td>0.1</td>
</tr>
<tr>
<td>Portugal</td>
<td>0.7</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Republic of Moldova</td>
<td>0.5</td>
</tr>
<tr>
<td>Romania</td>
<td>0.1</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>... (0.8-1.4)</td>
</tr>
<tr>
<td>Rwanda</td>
<td>2.9</td>
</tr>
<tr>
<td>Sao Tome and Principe</td>
<td>1.0</td>
</tr>
<tr>
<td>Senegal</td>
<td>0.7</td>
</tr>
<tr>
<td>Serbia</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>1.6</td>
</tr>
<tr>
<td>Singapore</td>
<td>0.1</td>
</tr>
<tr>
<td>Slovakia</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Country</td>
<td>Prevalence</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Cambodia</td>
<td>0.6</td>
</tr>
<tr>
<td>Cameroon</td>
<td>4.6</td>
</tr>
<tr>
<td>Canada</td>
<td>0.3</td>
</tr>
<tr>
<td>Cape Verde</td>
<td>1.0</td>
</tr>
<tr>
<td>Central African Republic</td>
<td>4.6</td>
</tr>
<tr>
<td>Chad</td>
<td>3.1</td>
</tr>
<tr>
<td>Chile</td>
<td>0.5</td>
</tr>
<tr>
<td>China</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Colombia</td>
<td>0.5</td>
</tr>
<tr>
<td>Comoros</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Congo</td>
<td>3.3</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>0.3</td>
</tr>
<tr>
<td>Croatia</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Cuba</td>
<td>0.2</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>DPR of Korea</td>
<td>…</td>
</tr>
<tr>
<td>D R of the Congo</td>
<td>…</td>
</tr>
<tr>
<td>Denmark</td>
<td>0.2</td>
</tr>
<tr>
<td>Djibouti</td>
<td>1.4</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>0.7</td>
</tr>
<tr>
<td>Ecuador</td>
<td>0.4</td>
</tr>
<tr>
<td>Egypt</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>El Salvador</td>
<td>0.6 (1.6*)</td>
</tr>
<tr>
<td>Equatorial Guinea</td>
<td>4.7</td>
</tr>
<tr>
<td>Eritrea</td>
<td>0.6 (1.5*)</td>
</tr>
<tr>
<td>Estonia</td>
<td>1.3</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>1.4</td>
</tr>
<tr>
<td>Fiji</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: WHO Global Health Observatory (GHO) 2013
*Upper estimate
## Appendix 13: Prevalence of Hepatitis B and C by region

### Table 13 a: Prevalence of Hepatitis B (HBsAg), adults 19-49 years, 2005

<table>
<thead>
<tr>
<th>Region</th>
<th>Prevalence*</th>
<th>Risk Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Asia and Pacific</td>
<td>2-7%</td>
<td>Low to High intermediate</td>
</tr>
<tr>
<td>South Asia</td>
<td>2-4%</td>
<td>Low intermediate</td>
</tr>
<tr>
<td>Central and Eastern Europe and Central Asia</td>
<td>2-7%</td>
<td>Low to High intermediate</td>
</tr>
<tr>
<td>North Africa and Middle East</td>
<td>2-4%</td>
<td>Low intermediate</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>&gt;5%</td>
<td>High intermediate to High</td>
</tr>
<tr>
<td>Latin America and Caribbean</td>
<td>&lt;2%-4%</td>
<td>Low to Low intermediate</td>
</tr>
<tr>
<td>Asia pacific, High income</td>
<td>5-7%</td>
<td>High intermediate</td>
</tr>
<tr>
<td>Australasia, high income</td>
<td>2-4%</td>
<td>Low intermediate</td>
</tr>
<tr>
<td>North America, high income</td>
<td>&lt;2%</td>
<td>Low</td>
</tr>
<tr>
<td>Western Europe, high income</td>
<td>&lt;2%</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Source:** Ott et al 2013 Global epidemiology of hepatitis B virus infection: New estimates of age –specific HBsAg Seroprevalence and endemicity

### Table 13 b: Prevalence of Hepatitis C

<table>
<thead>
<tr>
<th>GBD* Region</th>
<th>prevalence ** %</th>
<th>Risk level***</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Income Asia Pacific</td>
<td>1.4</td>
<td>Low</td>
</tr>
<tr>
<td>Central Asia</td>
<td>3.8</td>
<td>High</td>
</tr>
<tr>
<td>East Asia</td>
<td>3.7</td>
<td>High</td>
</tr>
<tr>
<td>South Asia</td>
<td>3.4</td>
<td>Moderate</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>2</td>
<td>Moderate</td>
</tr>
<tr>
<td>Australasia</td>
<td>2.7</td>
<td>Moderate</td>
</tr>
<tr>
<td>Caribbean</td>
<td>2.1</td>
<td>Moderate</td>
</tr>
<tr>
<td>Central Europe</td>
<td>2.4</td>
<td>Moderate</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>2.9</td>
<td>Moderate</td>
</tr>
<tr>
<td>Western Europe</td>
<td>2.4</td>
<td>Moderate</td>
</tr>
<tr>
<td>Andean Latin America</td>
<td>2</td>
<td>Moderate</td>
</tr>
<tr>
<td>Central/Southern Latin America</td>
<td>1.6</td>
<td>Moderate</td>
</tr>
<tr>
<td>Tropical Latin America</td>
<td>1.2</td>
<td>Low</td>
</tr>
<tr>
<td>North Africa/Middle East</td>
<td>3.6</td>
<td>High</td>
</tr>
<tr>
<td>North America</td>
<td>1.3</td>
<td>Low</td>
</tr>
<tr>
<td>Oceania</td>
<td>2.6</td>
<td>Moderate</td>
</tr>
<tr>
<td>Central Africa</td>
<td>2.3</td>
<td>Moderate</td>
</tr>
<tr>
<td>East Africa</td>
<td>2</td>
<td>Moderate</td>
</tr>
<tr>
<td>South Africa</td>
<td>2.1</td>
<td>Moderate</td>
</tr>
<tr>
<td>West Africa</td>
<td>2.8</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

**Source:** Hanafiah et al, 2013 Global Epidemiology of Hepatitis C Virus Infection: New Estimates of Age-Specific Antibody to HCV Seroprevalence

*Global Burden of Disease regions- see appendix 14 [page 30] for countries in the region
**prevalence of people with anti-HCV 2005
***Low risk (<1%), Moderate risk (1.5%-3.5%), High risk (>3.5%)
## Appendix 14: GBD regions and Countries

<table>
<thead>
<tr>
<th>Sub region</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>East Asia and Pacific region</strong></td>
<td></td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Maldives,</td>
</tr>
<tr>
<td></td>
<td>Myanmar, Philippines, Sri Lanka, Thailand, Timor-Leste, Viet Nam</td>
</tr>
<tr>
<td>East Asia</td>
<td>China, Hong Kong SAR (China), Macau SAR (China), Democratic People's</td>
</tr>
<tr>
<td></td>
<td>Republic of Korea, Taiwan</td>
</tr>
<tr>
<td>Oceania</td>
<td>Cook Islands, Fiji, French Polynesia, Kiribati, Marshall Islands, Micronesia</td>
</tr>
<tr>
<td></td>
<td>(Federated States of), Nauru, Palau, Papua New Guinea, Samoa, Solomon</td>
</tr>
<tr>
<td></td>
<td>Islands, Tonga, Vanuatu</td>
</tr>
<tr>
<td><strong>South Asia region</strong></td>
<td></td>
</tr>
<tr>
<td>South Asia</td>
<td>Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan</td>
</tr>
<tr>
<td><strong>Central and Eastern Europe and Central Asia region</strong></td>
<td></td>
</tr>
<tr>
<td>Central Asia</td>
<td>Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan,</td>
</tr>
<tr>
<td></td>
<td>Turkmenistan, Uzbekistan</td>
</tr>
<tr>
<td>Central Europe</td>
<td>Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary,</td>
</tr>
<tr>
<td></td>
<td>Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia, Macedonia (Former</td>
</tr>
<tr>
<td></td>
<td>Yugoslav Republic of)</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>Belarus, Estonia, Latvia, Lithuania, Moldova, Russian Federation, Ukraine</td>
</tr>
<tr>
<td><strong>North Africa and Middle East region</strong></td>
<td></td>
</tr>
<tr>
<td>North Africa and Middle East</td>
<td>Algeria, Bahrain, Egypt, Iran (Islamic Republic of), Iraq, Jordan, Kuwait,</td>
</tr>
<tr>
<td></td>
<td>Lebanon, Libyan Arab Jamahiriya, Morocco, Occupied Palestinian Territory,</td>
</tr>
<tr>
<td></td>
<td>Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, Turkey, United Arab</td>
</tr>
<tr>
<td></td>
<td>Emirates, Yemen</td>
</tr>
<tr>
<td><strong>Sub-Saharan Africa region</strong></td>
<td></td>
</tr>
<tr>
<td>Central Africa</td>
<td>Angola, Central African Republic, Congo, Democratic Republic of the Congo,</td>
</tr>
<tr>
<td></td>
<td>Equatorial Guinea, Gabon</td>
</tr>
<tr>
<td>East Africa</td>
<td>Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi,</td>
</tr>
<tr>
<td></td>
<td>Mauritius, Mozambique, Rwanda, Seychelles, Somalia, Sudan, Uganda, United Republic of Tanzania, Zambia</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Botswana, Lesotho, Namibia, South Africa, Swaziland, Zimbabwe</td>
</tr>
<tr>
<td>West Africa</td>
<td>Benin, Burkina Faso, Cameroon, Cape Verde, Chad, Côte d'Ivoire, Gambia,</td>
</tr>
<tr>
<td></td>
<td>Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria,</td>
</tr>
<tr>
<td></td>
<td>Senegal, Sierra Leone, São Tomé and Príncipe, Togo</td>
</tr>
<tr>
<td><strong>Latin America and Caribbean region</strong></td>
<td></td>
</tr>
<tr>
<td>Andean Latin America</td>
<td>Bolivia, Ecuador, Peru</td>
</tr>
<tr>
<td>Central Latin America</td>
<td>Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua,</td>
</tr>
<tr>
<td></td>
<td>Panama, Venezuela (Bolivarian Republic of)</td>
</tr>
<tr>
<td>Southern Latin America</td>
<td>Argentina, Chile, Uruguay</td>
</tr>
<tr>
<td>Tropical Latin America</td>
<td>Brazil, Paraguay</td>
</tr>
<tr>
<td>Caribbean</td>
<td>Antigua and Barbuda, Bahamas, Barbados, Belize, Bermuda, British Virgin</td>
</tr>
<tr>
<td></td>
<td>Islands, Cuba, Dominica, Dominican Republic, Grenada, Guyana, Haiti,</td>
</tr>
<tr>
<td></td>
<td>Jamaica, Netherlands Antilles, Puerto Rico, Saint Kitts and Nevis, Saint</td>
</tr>
<tr>
<td></td>
<td>Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago</td>
</tr>
<tr>
<td><strong>High-income regions</strong></td>
<td></td>
</tr>
<tr>
<td>Asia-Pacific, high-income</td>
<td>Brunei Darussalam, Japan, Republic of Korea, Singapore</td>
</tr>
<tr>
<td>Australasia</td>
<td>Australia, New Zealand</td>
</tr>
<tr>
<td>Western Europe</td>
<td>Andorra, Austria, Belgium, Cyprus, Denmark, Finland, France, Germany,</td>
</tr>
<tr>
<td></td>
<td>Greece, Greenland, Iceland, Ireland, Israel, Italy, Luxembourg, Malta,</td>
</tr>
<tr>
<td></td>
<td>Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom</td>
</tr>
<tr>
<td>North America,</td>
<td>Canada, United States of America</td>
</tr>
</tbody>
</table>