REPUBLIC OF GHANA

NATIONAL POLICY ON VIRAL HEPATITIS

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Abbreviations

ADR	Adverse drug reaction
AEFI	Adverse Events Following Immunization
BCC	Behaviour Change Communication
CHPS	Community-Based Health Planning and Services
CHAG	Christian Health Association of Ghana
CSOs	Civil Society Organizations
DHIMS	District Health Information Management System
DNA	Deoxyribonucleic acid
EPI	Expanded Programme
HAV	Hepatitis A
HBV	Hepatitis B
HCV	Hepatitis C
HDV	Hepatitis D
HEV	Hepatitis E
HIV	Human Immunodeficiency Virus
HBsAg	Hepatitis B surface Antigen
HBeAg	Hepatitis B envelop Antigen
GHS	Ghana Health Service
IDSR	Integrated Disease Surveillance and Response
MoH	Ministry of Health
MMDAs	Municipal, Metropolitan and District Assemblies of Immunization
NGO	Non-governmental Organization
NVHCP	National Viral Hepatitis Control Programme
NPHRL	National Public Health and Reference Laboratory

NMIMR	Noguchi Memorial Institute of Medical Research
PHL	Public Health laboratory
PHD	Public Health Division
PM	Programme Manager
PMTCT	Prevention of Mother to Child Transmission
PPMED	Policy Planning Monitoring and Evaluation Division
RNA	Ribonucleic acid
SOP	Standard Operating Procedure
WHO	World Health Organization
WHA	World Health Assembly

Foreword

Viral Hepatitis is an inflammation of the liver caused by specific viruses that primarily attack the liver. The causes of viral hepatitis are the five unrelated hepatotropic viruses, namely Hepatitis A, Hepatitis B, Hepatitis C, Hepatitis D, and Hepatitis E. Viral hepatitis has become a major public health concern globally. It is a major cause of cirrhosis and liver cancer, the 2nd leading cause of cancer death in the world. Worldwide, nearly over 500 million persons are living with chronic hepatitis B virus or hepatitis C virus infections, and these infections cause over 1 million deaths annually. Ghana is one of the countries where the prevalence of chronic Hepatitis B infection is high (≥8%) and that of hepatitis C virus is also high (5-10%). There is a high burden of infection with resulting high prevalence of chronic liver disease, cirrhosis and liver cancer, the leading cause of cancer death in Ghana due mainly to hepatitis. Effective tools are available to prevent and manage infection with viral hepatitis, including hepatitis B vaccination, surveillance, education, screening, and treatment. However there are challenges to build the capacity to extend these interventions country-wide.

The aim of this policy document is to give directions as to the provision of quality driven, results oriented, client focused and affordable Viral Hepatitis prevention and control services in-order to improve the health status of all people living with, and at risk of viral hepatitis in Ghana. The policy areas include Surveillance and Response; Laboratory diagnosis; Prevention of Viral Hepatitis; Advocacy, Communication and Social Mobilization; Treatment, Care and Support; Research; Regulation; Implementation framework; Monitoring and Evaluation; Resources mobilization and financing. This document will be widely circulated to all stakeholders including key Ministries, Departments and Agencies, Non-governmental Organizations, Civil Society, Key Organized Groups and the Private Sector. Due to the multisectoral nature of the response to Viral Hepatitis in Ghana and the NVHCP mandate to coordinate, monitor and evaluate all Viral Hepatitis activities, the NVHCP will be strengthened and given enabling environment to implement this policy. This policy is however directed to each person and I call upon all Leaders in our society, Heads of institutions to contribute their part to achieve the goal of reducing morbidity and mortality due to Viral Hepatitis to the barest minimum in Ghana.

Hon. Dr Kweku Agyemang-Mensah

Minister of Health

Acknowledgement

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1.0. Introduction

Hepatitis is inflammation of the liver that can be caused by infectious or non-infectious agents/substances such as viruses, bacteria, toxins, drugs, and alcohol use. Viral hepatitis is inflammation of the liver caused by viruses. Viral Hepatitis is commonly caused by one of several viruses [2, 3, 4]. The causes of viral hepatitis include the five unrelated hepatotropic viruses, namely Hepatitis A, Hepatitis B, Hepatitis C, Hepatitis D, and Hepatitis E. In addition to the nominal hepatitis viruses, other viruses that can also cause liver inflammation include Herpes simplex,Cytomegalovirus, Epstein-Barr virus, and Yellow fever among others[2, 3, 4].

Hepatitis A and E viruses are transmitted by faecal-oral route, through person-to-person contact, ingestion of contaminated food or water.

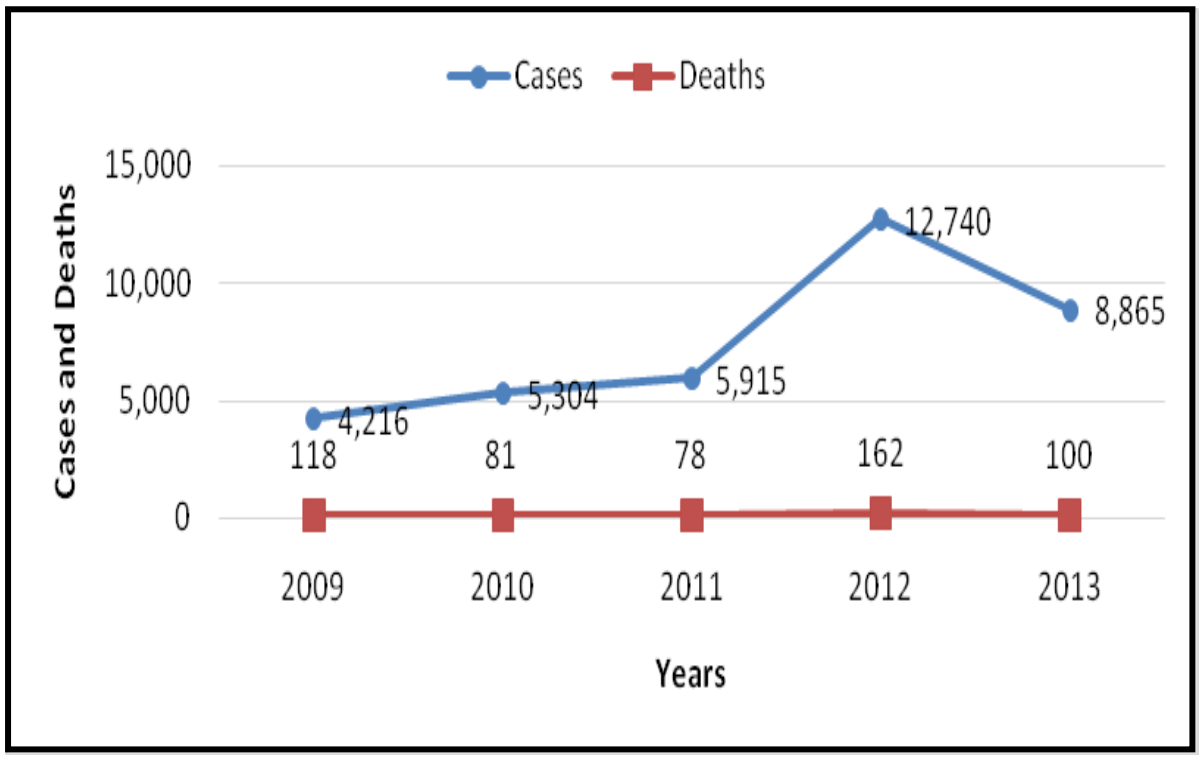
Hepatitis B, C and D viruses are transmitted through; Infectious blood, semen, vaginal fluid and other body fluids. The most important route of transmission is by sexual contact, either heterosexual or homosexual, with an infected person. For example, transmission occurs among men who have sex with men; from infected mothers to infants at time of birth and during transfusion with infected blood or blood products. Transmission may also occur from exposure to infected blood from instruments, such as those used to give injection or perform medical procedures, tattoos, shaving, manicures, circumcision, sharpening of pencils or knives, etc. (Annex 1).

Viral hepatitis has become a major public health concern globally. Worldwide, nearly over 500 million persons are living with chronic hepatitis B virus or hepatitis C virus infections, and these infections cause over 1 million deaths annually; most persons with chronic viral hepatitis are unaware of their infections. Hepatitis B and C are also major causes of cirrhosis and liver cancer, the 2nd leading cause of cancer death in the world.

1.1. Viral Hepatitis Disease Burden in Ghana

There is scanty national data on specific types of viral hepatitis in Ghana. However, surveillance data on clinical viral hepatitis from the Disease Surveillance Department (using the IDSR standard case definition for viral hepatitis) shows an increasing annual trend of reported clinical viral hepatitis cases from all the ten regions of Ghana[1]. In the year ending 2012, a total of 12,740 cases with 162 deaths which represents a 110% increase as compared to the year 2011 where 5,915 cases with 78 deaths were reported (Figure 1).

Figure 1: Annual Trend of Reported Clinical Cases of Acute Viral Hepatitis Cases and Deaths; Ghana, 2009-2013



Source: DHIMS 2 GHS, April 2014

In 2012 out of 842 blood specimen investigated at the National Public Health Reference-Laboratory 175 tested positive for Hepatitis B (20%) using HBsAg test, and 17 positive for hepatitis C (6%) of 282 tested using HCV Ab test.

Ghana belongs to the areas where the prevalence of chronic HBV infection is high (≥8%) [2] and that of hepatitis C virus is also high (5-10%) [3]. There is thus a high burden of infection with resulting high prevalence of chronic liver disease and liver cancer (hepatocellular carcinoma). Liver cancer is also the leading cause of cancer death affecting both Ghanaian men and women, according to the 2012 United Nations Globocan Report.

Various studies conducted in Ghana indicates that HBV is endemic in Ghana with sero-prevalence rates ranging from 6.7% to 10% in blood donors [4,5], 6.4% in pregnant women[6] and 15.6% in children[7] among the general population. Further studies shows the prevalence rate of HBsAg among parturients or pregnant women in Accra, Ghana, increased from 6·4% in 1994[6] to 10·5% in 2005[11].

Recent studies have revealed HCV sero-prevalence rates of 2.8% to 5.4% in Ghana [8, 9]. The seroprevalence of HCV is between 1·3 and 8·4% among blood donors in Ghana[9, 12, 13] 5·4% among children in a rural district in Ghana[7] and 2·5% among parturient in Accra, Ghana[16].

Studies among inmates of prisons in Ghana also indicates high prevalence of HBV and HCV For the 281 inmates tested, HIV seroprevalence was 19·2%, 17·4% had HBsAg, HCV seroprevalence was 19·2%. For the 82 officers tested, HIV seroprevalence was 8·5%, 3·7% had HBsAg, HCV seroprevalence was 23·2% The data indicate a higher prevalence of HIV and HCV in correctional facilities (both prison inmates and officers) than in the general population in Ghana, suggesting their probable transmission in prisons in Ghana through intravenous drug use, unsafe sexual behaviour and tattooing as pertains to prisons worldwide.

HBsAg was detected in 30 out of the 70 cases, giving a prevalence rate of 42.9% compared to the rate of 7.5% (21 out of 280) among the controls. HBV infection was significantly associated with cirrhosis (χ^2 = 75.622, P = 0.000, C.I. = 28.6 – 42.156.08; OR=8.07, 95% CI=4.62 – 15.20). The risk of developing cirrhosis increased 8-fold in patients with HBV infections than those without[15]. Hepatitis E (HEV) sero-prevelance was 28.66% (45/157) among pregnant women seen between the months of January and May, 2008 at the Obstetrics and Gynaecology Department, Korle-Bu Teaching Hospital, Accra, Ghana. 2009 Adjei et al; licensee BioMed Central Ltd.

There is a huge burden of patient with chronic Hepatitis B & C infections who are at risk of developing chronic liver disease and possibly primary liver cancer (hepatocellular carcinoma) if untreated. There is also the major problem of co-infection with HIV. Hence funding for treatment is a major objective while at the same time employing preventive vis-a-vis Hepatitis B vaccination programmes.

2.0. Policy Framework

2.1 Vision

Ghana free of viral hepatitis as a public health problem.

2.2 Mission

To provide direction and guidance for all stakeholders to play their respective roles in the establishment of an effective surveillance, prevention and control measures for the disease, provide treatment and support for the afflicted, and conduct relevant research to support the treatment and control of the disease.

2.3. Goal

To ensure that Viral Hepatitis (Hepatitis A, B, C, D & E) is no more of public health importance in Ghana i.e. to reduce morbidity and mortality to the barest minimum.

2.4. Objectives

1. To prevent the transmission of viral hepatitis within high risk groups and the general population
2. To establish an effective surveillance system for viral hepatitis and its co-morbidities.
3. To develop guidelines and protocols for the diagnoses and management of viral hepatitis disease and co-morbidities
4. To promote and coordinate nationwide research into viral hepatitis and its co-morbidities to support the prevention, control and management of the disease
5. To promote access to safe, effective and affordable diagnostics testing and treatment for viral hepatitis
6. To foster partnerships with key stakeholders, including civil society and the business community, for the prevention, control and management of the disease

2.5 Strategy

1. Advocacy and resource mobilization
2. Develop guidelines and protocols for the diagnoses and management of viral hepatitis disease and co-morbidities
3. Strengthen viral hepatitis surveillance including laboratory surveillance
4. Conduct research to improve knowledge and evidence in Viral Hepatitis
5. Vaccination
6. Screening, care and treatment
7. Collaboration and partnership with development partners, private sector and civil societies
8. Effective monitoring and evaluation

2.6. Guiding Principles

The implementation of this policy, will be guided by the guiding principles of the Ghana health service (Health sector policy) including integration into the general health services

2.7 Rationale

Viral hepatitis is a major public health concern in Ghana.There are challenges which includes; Lack of policy and guidelines for the delivery of services for the prevention and control of viral hepatitis, uncoordinated activities, unreliable data, uncontrolled Hepatitis-B screening and vaccination of populace by unauthorized persons, limited knowledge among health staff and population and lack of a research agenda to guide hepatitis response in the country over time. These coupled with an ever increasing demand for improved access to treatment and vaccination opportunities by the adult populace provides a logical basis for the development of this policy document to guide the prevention and control of viral hepatitis.

At the 63rd World Health Assembly, Member States accepted the report of the Secretariat to the World Health Assembly and adopted resolution WHA 126.R16 including a celebration of a "World Hepatitis Day" on the 28th July each year. The resolution among other things mandates countries to establish a National Viral Hepatitis Control Programme (NVHCP) for a comprehensive approach to the prevention and control of viral hepatitis.

3.0 Policy Areas:

The policy areas include the following:

1. Surveillance and response
2. Laboratory diagnosis
3. Prevention of viral hepatitis
4. Advocacy, communication and Social Mobilization
5. Treatment Care and Support
6. Research
7. Regulation
8. Implementation framework
9. Monitoring and Evaluation
10. Resources mobilization and Financing

4.0 Policy Area 1: Surveillance and Response

The policy direction- establish viral hepatitis surveillance system capable of detecting, confirming and management of all hepatitis cases in Ghana and respond to any hepatitis outbreaks

- Detection: early detection, timely and complete reporting
- Confirmation: laboratory confirmation of all types of Viral Hepatitis
- Case management: adequate management of cases at all levels of the health system
- Response: timely and appropriate response to outbreaks of viral hepatitis
- Conduct periodic national sero-prevalence studies
- Coordinate Viral Hepatitis information management
- Develop standard operating procedures for viral hepatitis surveillance

5.0 Policy Area 2: Laboratory Diagnosis

The policy direction- establish a comprehensive and accessible Laboratory services capable of detection and characterization of all types of Viral Hepatitis

- Make laboratory testing available at all regional, district and Public Health laboratories in the countrywith the use of standardized/accredited testing reagents/kits
- Perform laboratory testing for all patients reporting at health facilities with suspected viral hepatitis
- The National Public Health Reference Laboratory (NPHRL) shall coordinate all laboratory results on viral hepatitis from all Clinical laboratories, Zonal PHL and Blood Transfusion units in the country
- Develop Standard Operating Procedures (SOP) for laboratory services
- Establish collaboration with national and international medical research facilities

6.0 Policy Area 3: Prevention of Viral Hepatitis

The policy direction- establish a system to protect the at risk population in Ghana

6.1 Hepatitis vaccination:

- Provide universal access to hepatitis B vaccination for all children 0-11 months (including all at birth receiving the birth dose vaccine) within the National Immunization Programme
- Improve access to Viral Hepatitis B vaccination and other hepatitis vaccines available for all persons one year and above (in particular persons at risk)
- Improve access to all other hepatitis vaccines available
- Provide free vaccination and post-exposure prophylaxis for health workers (any person professionally trained to work in health care setting)
- The National Immunization Programme shall coordinate all vaccination exercises

6.2 Screening

- Support organization of periodic mass screening exercise
- Routinely screen all health care professionals for Hepatitis B and C
- Screening shall be done only by accredited public and private institutions
- Provide all pregnant women access to Hepatitis B and C screening as part of routine peri-natal care

    - Infants born to HBsAg positive women to be given hepatitis B vaccine and hepatitis B immunoglobulin (PMTCT HepB)
- Develop standard operating procedures for screening hepatitis B and C, including first degree relatives and partners of known positives and other high risk personnel
- Establish a centralized procurement system to ensure standard hepatitis screening/testing kits are procured for use nationwide.
- Screening of all donated blood for both hepatitis B and C, using standardized and accredited testing reagents/kits and performed in a quality-assured manner

6.3 Prevention in health care settings

- Provide access to transfusion of safe blood and blood products for all persons requiring haemotherapy
- Institute effective blood safety and infection prevention and control measures including the provision of safe injections to protect health workers clients and the environment
- Provide access to guidelines for prevention and management of needle stick injury among health workers
- Manage health care waste in compliance with existing laws and health regulations to protect health workers clients and the environment
- Provide free post-exposure prophylaxis health workers (any person professionally trained to work in health care setting)
- Develop a comprehensive system to monitor and respond to adverse drug reaction (ADR/AEFI)

7.0 Policy Area 4: Advocacy, communication and Social Mobilization

The policy direction- to have a well-informed public capable of making informed decision on viral hepatitis

- Improve access to timely, accurate and appropriate information on Viral Hepatitisamong the general population, policy makers, health care workers and key populations
- Promote social and legal environment that enable an equitable response to viral hepatitis (stop stigmatization, discrimination and criminalization)

- Advocate for support for Viral Hepatitis control including promoting the use of condoms, provision of safe and adequate water, improved sanitation, good personal hygiene practices, food safety and blood safety initiatives.
- Observe national and international days on Viral Hepatitis e.g. World Hepatitis Day

8.0 Policy Area 5: Treatment Care and Support

The policy direction- Provide access to safe effective and affordable diagnostics and treatments to facilitate comprehensive care for all

- Develop standard operating procedures (procedure, guidelines, tools) for management of viral hepatitis and counseling, support and care for infected individuals
- Assure timely access to chronic HBV and HCV diagnosis, care, treatment, follow-up and other supportive services and their integration into primary health care settings
- Foster collaboration with specialist centres in secondary /tertiary hospitals
- Establish programmes to support care and treatment for special groups (intravenous drug use, pregnant women, etc.)
- Develop guidelines on ADR/AEFI pharmacovigilance

9.0 Policy Area 6: Research

The policy direction- To provide information for evidence-based national programme to effectively respond to the viral hepatitis disease burden. This shall be done in collaboration with the Research Division of Ghana Health Service and other relevant stakeholders.

- Conduct periodic studies on viral hepatitis disease burden (morbidity, mortality and disability)
- Conduct baseline studies, periodic reviewsand impact assessment.
- Evaluate the effectiveness/efficacy of new interventions/technologies for viral hepatitis
- There shall be periodic dissemination of Viral Hepatitis research priorities in collaboration with Research Division and other stakeholders.

10.0 Policy Area 7: Regulation

The policy direction- compliance with national and international laws and recommendations.

- Create an adequate statutory and regulatory environment for prevention and control of viral hepatitis
- Be guided by internationally recognized hepatitis agencies and experts (e.g. CDC, WHO)

11.0 Policy Area 8: Implementation Framework

The policy direction-The implementation of National Health Policy on Viral Hepatitis in Ghana shall be done through a national health strategic plan.The National Viral Hepatitis Control Programme (NVHCP) established in the Public Health Division of Ghana Health Service/Ministry of Health shall be responsible for the coordination, monitoring and evaluation of this policy.

Structures, institutions, strategic partners, individuals, households and other actors shall be identified as well as their roles and their inter-relations through effective communication and engagement with stakeholders. (Annex 2)

12.0 Policy Area 9: Monitoring and Evaluation

Policy direction: establish an effective Monitoring and Evaluation systemto access performance of programme implementation and provide guidance for improvement

- Develop comprehensive monitoring indicators
- Conduct regular monitoring, supervision and evaluation exercises

13.0 Policy area 10: Resources mobilization and financing of Viral Hepatitis prevention and control

Policy direction: Put in measures to ensure adequate mobilization of the resources needed for implementation of the national viral hepatitis prevention and control plan

- Mobilize national and international resources appropriate and commensurate with the burden for a more effective national response (financial, human resource, vaccines, commodities, medicines, etc)
- Comply with all financial rules and regulations

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15.0 Annexes

15.1 Annex 1: Epidemiology and Clinical Characteristics of Viral Hepatitis

1.1. Viral Hepatitis A

Hepatitis A (formerly known as infectious hepatitis) is an acute infectious disease of the liver caused by the hepatitis A virus (HAV), a ribonucleic acid (RNA) virus. Tens of millions of individuals worldwide are estimated to become infected with HAV each year. Approximately 40% of all acute viral hepatitis is caused by HAV.

Infections usually spread by the faecal-oral route. It is transmitted person-to-person by ingestion of contaminated food or water or through direct contact with an infectious person. The incubation period is between two and six weeks, an average of 28 days. In developing countries, and in regions with poor hygiene standards, the incidence of infection with this virus is high and the illness is usually contracted in early childhood.

HAV infection produces a self-limiting disease that does not result in chronic infection or chronic liver disease. However, 10–15% of patients might experience a relapse of symptoms during the 6 months after acute illness. Acute liver failure from Hepatitis A is rare (overall case-fatality rate: 0.5%). The risk for symptomatic infection is directly related to age, with more than 80% of adults having symptoms compatible with acute viral hepatitis and the majority of children having either asymptomatic or unrecognized infection.

Antibody produced in response to HAV infection persists for life and confers protection against reinfection. The disease can be prevented by vaccination, and hepatitis A vaccines have been proven effective in controlling outbreaks worldwide.

1.2. Viral Hepatitis B

Hepatitis B is caused by the hepatitis B virus (HBV). Hepatitis B virus is a deoxyribonucleic acid (DNA) virus. HBVs replicate through an RNA intermediate form by reverse transcription which in practice relates them to retroviruses. The hepatitis B virus is 50 to 100 times more infectious than HIV and about 10 times more than hepatitis C.

HBV has caused epidemics in parts of Asia and Africa. About a third of the world population has been infected at one point in their lives, including 350 million who are chronic carriers.

Transmission of hepatitis B virus results from exposure to infectious blood or body fluids. Mode of transmission include sexual contact, especially multiple sexual partners, blood transfusions with infected blood and transfusion with other infected human blood products; re-use of contaminated needles and syringes, and vertical transmission from mother to child

(MTCT) during childbirth. Without intervention, a mother who is positive for HBsAg confers a 20% risk of passing the infection to her offspring at the time of birth. This risk is as high as 90% if the mother is also positive for HBeAg. HBV can be transmitted horizontally between family members within households, and among children possibly by contact of non-intact skin or mucous membrane with secretions containing HBV. However, at least 30% of reported hepatitis B among adults cannot be associated with an identifiable risk factor.

Other risk factors for contracting HBV infection include working in a healthcare setting, blood transfusions, dialysis, acupuncture, tattooing, body piercing, scarification, using contaminated razors or toothbrushes. However, hepatitis B viruses cannot be spread by holding hands, sharing eating utensils or drinking glasses, kissing, hugging, coughing, sneezing, or breastfeeding.

1.2.1 Acute Infections

Acute infection with hepatitis B virus is characterised by sudden onset of general ill-health, loss of appetite, nausea, vomiting, body aches, mild fever, and dark urine, and then progresses to development of jaundice. The illness lasts for a few weeks and then gradually improves in most affected people. A few people may have more severe liver disease (fulminating hepatic failure), and may die as a result. The infection may be entirely asymptomatic and may go unrecognized.

1.2.2 Chronic infections

Chronic infection with hepatitis B virus may be asymptomatic or associated with a chronic inflammation of the liver. About 6-10% of patients with hepatitis B develop chronic HBV infection (infection lasting at least six months and often years to decades) and can infect others as long as they remain infected (insert refer). Two types of chronic hepatitis B active infection are recognised i.e. HBeAg positive and HBeAg negative, the latter may be inactive with low viral load or active with high viral load as a result of replicating viral mutants. Patients with chronic hepatitis B infection also are at risk of developing cirrhosis, liver failure and liver cancer.

1.2.3 Reactivation/Acute-on-Chronic

Hepatitis B virus DNA persists in the body after infection, and in some people the disease recurs. The infection goes through four (4) phases namely: immune tolerant, immune activation, immune clearance, and inactive. These phases are of variable and unpredictable duration. One phase may revert to another depending immune status of the person.eg inactive phase may become reactive; hence the need for regular surveillance. Although rare,

reactivation is seen most often following alcohol or drug use, or in people with impaired immunity. Approximately 50% of overt carriers experience acute reactivation. Although reactivation can occur spontaneously, people who undergo chemotherapy have a higher risk. The risk of reactivation varies depending on the serological profile; those with detectable HBsAg in their blood are at the greatest risk, but those with only antibodies to the core antigen are also at risk.

1.3. Hepatitis C

Hepatitis C is caused by the hepatitis C virus (HCV).

It is estimated that 130–200 million people, or ~3% of the world's population, are living with chronic hepatitis C. About 3–4 million people are infected per year, and more than 350,000 people die yearly from hepatitis C-related diseases. Rates have increased substantially in the 20th century due to a combination of Intravenous Drug Use (IDU) and intravenous medication or poorly sterilized medical equipment.

The hepatitis C virus (HCV) usually is spread by shared needles among IDUs, blood transfusion, haemodialysis, scarification and use of contaminated needles and other sharps. Transmission by sexual contact is rare.

Tattooing is associated with two to threefold increased risk of hepatitis C. This can be due to either improperly sterilized equipment or contamination of the dyes being used. The risk also appears to be greater for larger tattoos. Personal-care items such as razors, toothbrushes, and manicuring or pedicuring equipment can be contaminated with infected blood. Sharing such items can potentially lead to exposure to HCV. Vertical transmission of hepatitis C from an infected mother to her child occurs in less than 10% of pregnancies. HCV is not spread through casual contact, such as hugging, kissing, or sharing eating or cooking utensils; neither is it transmitted through food or water. The hepatitis C virus remains active (live) on surfaces for up to 63 days.

1.3.1 Acute infection

Hepatitis C infection causes acute symptoms in 15% of cases. Symptoms are generally mild and vague, including a decreased appetite, fatigue, nausea, muscle or joint pains, and weight loss and rarely does acute liver failure result. Most cases of acute infection are not associated with jaundice. The infection resolves spontaneously in 10-50% of cases.

1.3.2 Chronic infection

Chronic hepatitis C is defined as infection with the hepatitis C virus persisting for more than six months based on the presence of its RNA. About 90% of those exposed to the virus develop a chronic infection. Most experience minimal or no symptoms during the initial few decades of the infection, although chronic hepatitis C can be associated with fatigue. Hepatitis C after many years becomes the primary cause of cirrhosis and liver cancer. About 10–30% of people develop cirrhosis over 30 years. Cirrhosis is more common in those co-infected with hepatitis B or HIV, alcoholics, and those of male gender. Those who develop cirrhosis have a 20-fold greater risk of hepatocellular carcinoma, a rate of 1–3% per year, and if this is complicated by excess alcohol the risk becomes 100 fold greater. Hepatitis C is the cause of 27% of cirrhosis cases and 25% of hepatocellular carcinoma worldwide.

1.4. Viral Hepatitis D

Hepatitis D, is caused by Hepatitis D Virus (HDV), an RNA virus, classified as *Hepatitis delta virus*. HDV is considered to be a sub viral satellite because it can propagate only in the presence of hepatitis B virus (HBV). Transmission of HDV can occur either via simultaneous infection with HBV (coinfection) or superimposed on chronic hepatitis B or hepatitis B carrier state (superinfection).

Both superinfection and coinfection with HDV results in more severe complications compared to infection with HBV alone. These complications include a greater likelihood of experiencing liver failure in acute infections and a rapid progression to liver cirrhosis, with an increased chance of developing liver cancer in chronic infections. In combination with hepatitis B virus, hepatitis D has the highest mortality rate of all the hepatitis infections, at 20%. The routes of transmission of hepatitis D are similar to those for hepatitis B. Infection is largely restricted to persons at high risk of hepatitis B infection, particularly injecting drug users and persons receiving clotting factor concentrates.

The vaccine for hepatitis B protects against hepatitis D virus because of the latter's dependence on the presence of hepatitis B virus for it to replicate.

Worldwide more than 15 million people are co-infected. HDV is rare in most developed countries, and is mostly associated with intravenous drug use. In all, about 20 million people may be infected with HDV.

1.5. Hepatitis E

Hepatitis E is caused by hepatitis E virus (**HEV**). Infection with this virus was first documented in 1955 during an outbreak in New Delhi, India.

It is spread mainly through faecal contamination of water supplies or food; person-to-person transmission is uncommon.

The incubation period following exposure to the hepatitis E virus ranges from three to eight weeks, with a mean of 40 days. Outbreaks of epidemic hepatitis E most commonly occur after heavy rainfalls, because of disruption of water supplies (insert ref).

The incidence of hepatitis E is highest in juveniles and adults between the ages of 15 and 40. Though children often contract this infection as well, they less frequently become symptomatic. Mortality rates are generally low, for hepatitis E is a "self-limiting" disease. Hepatitis E occasionally develops into an acute, severe liver disease, and is fatal in about 2% of all cases. Clinically, it is comparable to hepatitis A, but in pregnant women the disease is more often severe and is associated with fulminating hepatic (liver) failure. Pregnant women, especially those in the third trimester, suffer an elevated mortality rate from the disease of around 20%

1.5.1 Chronic infections

In immunocompromised subjects, Hepatitis E may cause a chronic infection. Occasionally this may cause liver cirrhosis

The hepatitis E virus causes around 20 million infections a year. These result in around three million acute illnesses and 70,000 deaths annually.

Major outbreaks have been reported between 2004 and 2013 in Africa (Chad, Uganda and Sudan), India, and Bangladesh. Outbreak in Uganda progressed to become one of the largest hepatitis E outbreaks in the world with over 10,196 cases and 160 deaths.

1.5.2 Animals as a reservoir

Domestic animals have been reported as a reservoir for the hepatitis E virus, with some surveys showing infection rates exceeding 95% among domestic pigs. Replicative virus has been found in the small intestine, lymph nodes, colon and liver of experimentally infected pigs.

15.2 Annex 2: Implementation Framework for Viral Hepatitis Policy

Institution	Role	Inter-relationship
MoH		Policy makers
Minister of Health	• Policy formulation • Resource mobilization • Allocation of resources • Advocacy	Public
PPMED-MOH	• Planning and Budgeting for the vaccine • Monitoring and evaluation • Advocacy	Public
Procurement Unit (MOH)	• Procurement and distributions of vaccines, medicines, test kits, equipment and other logistics, vehicles	Public
Food and Drug Authority	• Regulation and enforcement (medicines, vaccines, reagents?)	Public-Regulators
NMIMR	• Collaboration and further confirmation tests • Research	Public
Teaching hospitals	• Surveillance, Case detection • Treatment and care of referred cases • Quality Assurance • Monitoring and supervision • Post exposure prophylaxis • Periodic screening and vaccination for health workers • Development of treatment guidelines	Public
National Blood Service	• Provision of safe blood and blood products • Recruitment of voluntary non remunerated donors from a low risk population of hepatitis B & C • Careful and stringent selection of prospective blood donors using established criteria	Agency- Service Providers

Institution	Role	Inter-relationship
	• Screening of all donated blood using sensitive standard kits in a quality-assured manner • Ensure appropriate clinical use of blood and components • Haemovigilance (surveillance) • Research for development	
GHS/Office of the Director General	• Leadership and coordination • Advocacy, Behavioural change communication and social Mobilization • Resource mobilization and allocation • Planning and budgeting • Quantification, Procurement, storage and distributions of vaccines, medicines, test kits, equipment and other logistics, vehicles • Human resource Planning, development and placement • Ensuring accountability and judicious use of resources • Development of guidelines and SOPs • Supervision, Performance review, Monitoring and Evaluation • NVHCP coordination • Collaboration and partnership e.g. civil society groups, NGO, etc. • Surveillance; screening (mass, health workers and pregnant women), sero-prevalence surveys • Vaccination • Treatment and care • Quality Assurance • Post exposure prophylaxis • Operational Research	Public

Institution	Role	Inter-relationship
GHS-Regions	• Advocacy and communication • Policy implementation • Resource mobilization and distribution • Integration of service • Monitoring and supervision	Public
GHS-Districts	• Operational planning and implementation • Advocacy and BCC • Surveillance • Mainstreaming Viral Hepatitis prevention and control into routine service • Monitoring and supervision	Public
GHS-Subdistricts	• Implementation (Surveillance, treatment, referral, support, care and vaccination) • Documentation and Reporting • Social mobilization and BCC • Integration of service • Monitoring and supervision	Public
CHPS zones	• Surveillance • Referral • Care and support • Vaccination • Documentation and Reporting • Social mobilization and BCC • Community monitoring and supervision • Follow ups	Public
MMDAs	• Resource mobilization • Advocacy	Public- Local government
Private Health Sector	• Resource Mobilization • Surveillance • Care and treatment	Private- Service Providers

Institution	Role	Inter-relationship
CHAG	• Surveillance, Case detection • Treatment and care • Quality Assurance • Monitoring and supervision • Post exposure prophylaxis • Periodic screening and vaccination for health workers	Faith-based- Service Providers
Media	• BCC • Advocacy and awareness creation	Private & Public- Watchdogs, advocates and voice of the masses
Developing Partners	• Advocacy • Procurement of vaccines, medicines and other supplies • Resource mobilization • Policy reviews • Technical assistance e.g. vaccination, treatment of hepatitis B and C patients	Donors
CSOs	• Accountability • Resource mobilization • Advocacy • Policy reviews • BCC • Capacity building	Civil Society including NGOs (Not for Profit)- watchdogs and voice of the masses
Chiefs and Opinion leaders	• BCC • Community monitoring and supervision • Resource mobilization	Consumers
Individuals, households and Community	• Utilization of services • Demand for quality care • Demand information • Demand privacy and confidentiality • Demand safety and security	Consumers