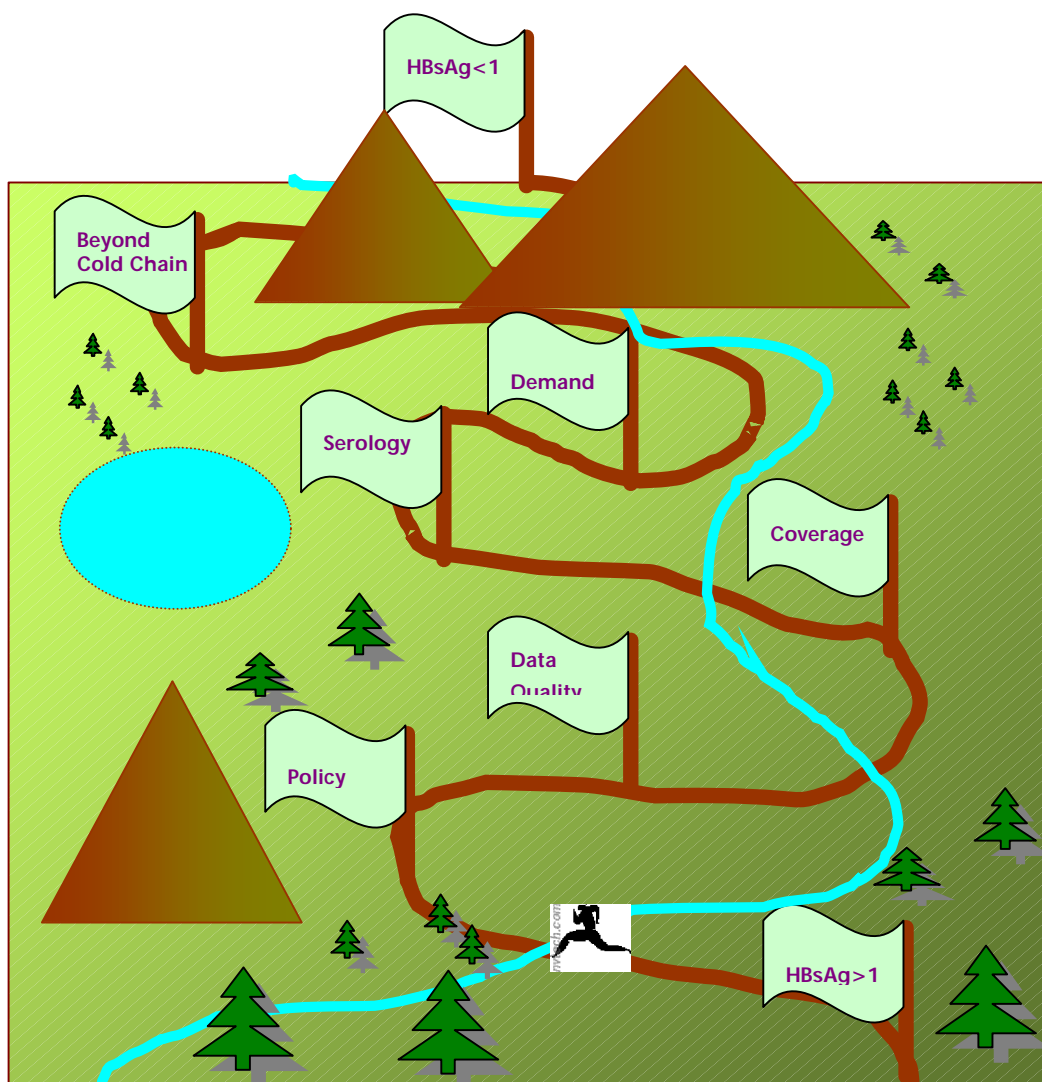


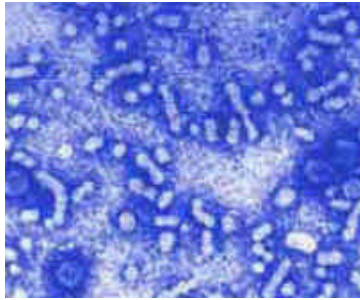
# Hepatitis B in the Western Pacific Region

Next steps to control by immunization



## Basic Facts

### The Disease



Hepatitis B is a viral infection producing inflammation of the liver. In the Western Pacific Region, it is often contracted during birth. It can also be contracted by absorption of infected blood through cuts and abrasions as well as through contaminated injection equipment and by sexual contact.

The risk of becoming chronically infected depends on the age at the time of initial infection: for newborns it can be more than 90 percent, for children around 50 percent. Less than 5 percent of adults infected with hepatitis B develop chronic hepatitis. In the Western Pacific Region, around 40% of all chronic infections with hepatitis B begin at birth.

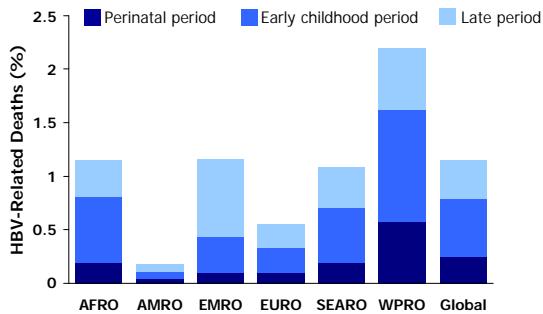
The liver disease associated with hepatitis B infection results largely from the immune response to the virus. In seeking to kill the virus, the immune system damages the liver cells in which the virus is multiplying. Chronically infected people, called 'carriers', are much more likely to develop cirrhosis and liver cancer because of this.

Acute hepatitis B disease is often asymptomatic in children. It takes between 1 to 6 months from the time of infection for the disease to become manifested. Approximately 1% of acute infections are fatal. There is a safe and effective vaccine against hepatitis B. Three doses, with the first dose optimally given within 24 hours of birth, can prevent the infection and subsequent disease.



## The Disease Burden

### Proportion of Total Deaths in the 2000 Birth Cohort from Hepatitis B, By Age at Infection<sup>1</sup>



<sup>1</sup>Future deaths in 2000 birth cohort, without vaccination



Hepatitis B is estimated to cause from 60% to 80% of primary liver cancer worldwide. The Western Pacific Region, home to 28% of the global population, suffers disproportionately from hepatitis B, containing around 45% of all infected individuals. Here, mother-to-child and child-to-child transmission accounts for the majority of infections and carriers. Although young children rarely develop the acute

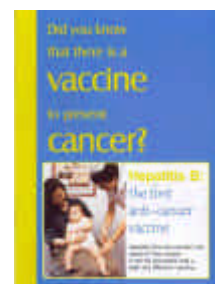
form of the disease, at least one in four of those infected before the age of seven will become long-term carriers. Of the approximately 278,000 deaths attributed to hepatitis B in the Region, the greatest proportion is from the consequences of chronic liver disease.

## Immune Response

The human immune response to infection with hepatitis B virus is complex and includes both cellular and antibody-mediated mechanisms. Because of the nature of this response, it is possible to detect different elements of the virus particle in the blood and other tissues using immunological methods. A number of these immune markers are useful for diagnosis, screening and for determining carrier state. One of these, the blood level of hepatitis B surface antigen (HbsAg), provides an effective measure of the impact of immunization.

## Vaccination

A safe and effective vaccine against hepatitis B became available over 20 years ago. At the time, it cost \$US 150 for three doses. Since that time, new manufacturing technologies, more manufacturers and much larger production batches have contributed to very significant reductions in the vaccine price. Currently, it costs around \$US 0.60 per dose.



The most important strategy for hepatitis B control is to deliver three doses of hepatitis B vaccine to all infants. This strategy is considerably more effective if the first dose is delivered within 24 hours of birth, as it prevents the development of chronic infection from exposure to the virus in the birth canal. In 1992, WHO recommended that hepatitis B vaccine be integrated into the national immunization programme of all countries.



## The WPRO Country Situation

### Vaccine Introduction

**There are still around 5,757,000 infants in the Region each year not receiving full hepatitis B immunization,**

In the Western Pacific Region, South Korea was one of the first countries to begin manufacturing the vaccine. Several nations/areas including Brunei Darussalam and Hong Kong introduced the vaccine at this time. Most Pacific countries began using the vaccine by 1992, by which time the price had dropped significantly. Tokelau introduced the vaccine nationally in 1997. Only five nations in the Region delayed introduction beyond this:

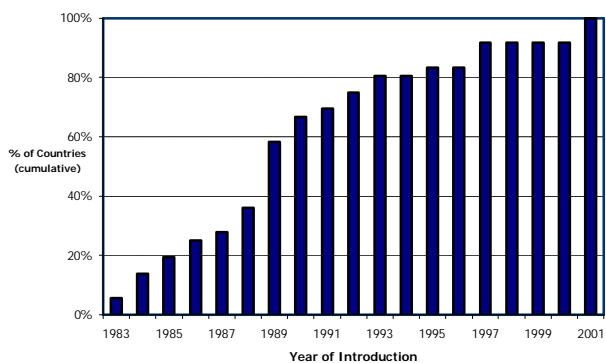
- Australia piloted the vaccine 1983 but it was not until 2000 that it became national policy to provide it to all children.
- Cambodia introduced a tetra-valent DTP-HepB vaccine in 2001 in two operational districts and plans to achieve national coverage by 2005
- China introduced the vaccine as a pilot in 1985 and extended the coverage nationally in 2003.
- Papua New Guinea introduced the vaccine in 1998 nationwide.

- Viet Nam introduced the vaccine in a pilot area in 1997 and nationally in 2003.

The vaccine is not part of the national schedule in Japan where all mothers are screened ante-natally and babies given immune globulin if born to carrier mothers. Several other countries also conduct antenatal screening and give immune globulin to babies in addition to the vaccine.

Of the 25 of 37 countries of the Region reporting coverage data, 15 reported rates greater than 85%. Only 4 of these 25 countries reported coverage of less than 70% (Philippines, Papua New Guinea, Vanuatu and Vietnam). Of the remaining 11 countries, one has chosen not to use the vaccine; four did not report progress and three had only recently begun giving the vaccine. Considering this is a newly introduced vaccine for many countries, the results are impressive. However, WHO has estimated that there are still around 5,757,000 infants in the Region each year not receiving full hepatitis B immunization, with nearly 70% of these occurring in China.

Country Introduction of Hepatitis B Vaccine



### The Current Regional Plan

**Milestone:**  
**The achievement of HBsAg prevalence of less than one percent in five-year-olds born after hepatitis B immunization started**

A plan to improve hepatitis B control through immunization was prepared in January 2003, with the milestone - **HBsAg < 1% in five-year-olds born after commencement of routine vaccination** - to measure the progress of countries toward the local achievement of this objective.

Suggested strategies to operationalise the objective were presented to countries to initiate action. Since the Plan was released, some progress has been made across the Region in implementing these strategies, which are

detailed below together with an indication of the proportion of countries achieving progress.



Establishment of an integrated (into routine immunization) national hepatitis B control plan



Establishment of a system to monitor birth dose delivery



Setting of target date for achieving (or have already achieved) at least 80% birth dose coverage by 2004



Inclusion (with specific country exceptions) of receipt of at least 3 doses of anti-hepatitis B vaccine into the definition of a fully immunized child



Achievement of at least 80% (ideally 95%) full EPI immunization of each birth cohort and in every district by 2005

 No Progress     Implemented     No Data / N/A

On 10 September 2003, the WHO Regional Committee for the Western Pacific adopted resolution WPR/RCM 54.R3 *Expanded Programme on Immunization*. The resolution indicated that hepatitis B control should be a high priority and should, in addition, become a major strategy in efforts to strengthen routine immunization. Specifically, it confirmed that the principal objective of hepatitis B control programmes should be the achievement of HBsAg prevalence of less than one percent in five-year-olds born after hepatitis B immunization started.

## Taking stock

According to information specifically collected from countries in March 2004, less than 20% have developed an integrated Plan of Action for hepatitis B control. Only around one third of the Region's countries have reported their inclusion of three doses of hepatitis B vaccine in the definition for a fully immunized child. Less than 20% of countries have reported the development of a birth-dose monitoring system. More than 50% have yet to report a target date for achieving 80% birth dose coverage.

This incomplete uptake of basic strategies for achieving hepatitis B control may indicate the presence of underlying constraints at country level to the implementation of the Plan of Action.

## Identifying Constraints

### Routine Coverage

**In some respects, the increased burden of additional injections and data recording requirements stresses rather than strengthens immunization service delivery**

The Regional Plan places emphasis on protecting infants through routine immunization. In developing a national hepatitis B control plan, the priority is to deliver a minimum of three doses of the vaccine, with the first dose given as soon as humanly possible after birth and within 24 hours of birth if the vaccine is to be effective in preventing chronic carriage. However, even without a timely birth dose, there is value in routinely immunizing infants, as this will limit child-to-child transmission, responsible for more than 50% of chronic carriage.

The Regional Committee Meeting noted that hepatitis B control would require the strengthening of routine immunization services, including improving the quality of routinely reported coverage data. However, there is no clear link between the addition of a vaccine to a national schedule and the strengthening of service delivery. In some respects, the increased burden of additional injections and data recording requirements due to hepatitis B vaccine administration stresses rather than strengthens service delivery.

Any strengthening of service delivery associated with routine hepatitis B immunization will be, of necessity, focused on existing measures. These include district level micro-planning, data quality self-assessments, mid- and senior level management training and the range of technical capacity development strategies (cold chain, logistics, forecasting etc) specific to immunization activities. While this strengthening is of fundamental importance in reaching every child, none of these activities are hepatitis B specific and collectively they do not comprise a focused national plan of action for hepatitis B control.

The only truly novel element of hepatitis B immunization that has unique potential to fundamentally strengthen service delivery is the implementation of a birth dose. Yet, the volume of resources and the scale of effort required to achieve this makes it almost unattainable in some country settings. This represents a fundamental constraint to Regional Plan implementation.

### Policy and Procedural Issues

**For some countries, achieving 80% coverage of a birth dose presents formidable programmatic challenges**

It is widely recognized that mother-to-child transmission of the virus leads to around 40% of chronic hepatitis disease burden in the Region and that the delivery of a dose of hepatitis B vaccine within 24 hours of birth is a critical factor in the prevention of chronic carriage. Yet, for countries where a high proportion of births occur unattended in the home, achieving 80% coverage of a birth dose and systematically monitoring its timeliness present formidable programmatic challenges. However, underlying some of the challenges are policy, procedural and programmatic issues that may be amenable to change. These include:

#### **Birth Registration**

Before a birth dose can be delivered, the birth event must be identified. A fundamental policy/procedural issue is therefore birth registration and notification. Country-level answers to questions including:



- How are births notified?
- By whom?
- When?
- What laws or regulations apply?

can assist with the development or refinement of policies and procedures on birth registration that strengthen the capacity of immunization services to deliver a timely birth dose. This will, however, require that national immunization programmes engage in cross-sectoral dialogue with social planning authorities to achieve needed policy development or change.

### **Birth Dose Delivery Responsibility**

Another policy issue is responsibility for delivering a birth dose in specific contexts. Again, country-level answers to questions including:

- Is it always the responsibility of the immunization service?
- Can it be the midwives in a hospital or birth facility?
- Can community midwives or traditional birth attendants do it for home births?
- How will the birth dose be recorded if not given by the immunization service?
- How can injection safety policy be implemented in these circumstances?

can help shape policy development for birth dose delivery responsibility. While there may be managerial challenges, adding to the human resource base for birth dose delivery will ultimately increase capacity and strengthen immunization service delivery. Again, this will require that national immunization programmes engage in intra-sectoral dialogue to clarify roles and responsibilities and refine policy and procedures.

### **Beyond-Cold-Chain use of vaccine**

The well-documented properties of the hepatitis B vaccine to retain potency outside the cold chain can be strategically

exploited in achieving target birth dose coverage levels in some country settings. Although relatively heat-stable, the hepatitis B vaccine appears to be freeze-sensitive. Prevention of freezing during transport and storage is critical for effective hepatitis B immunization.

Policy and procedural issues around vaccine storage conditions and beyond-cold-chain use of monovalent hepatitis B vaccines with VVMs can be addressed at country level to further increase the opportunity for birth dose delivery and result in strengthening the immunization system. This may require dialogue between national immunization programmes and relevant regulatory authorities to develop the necessary policy and operational guidelines.

A focused effort by countries with high proportions of home births on resolving these policy, procedural and programmatic issues is a high priority. These efforts may eventually reduce the constraints to a level that gradual introduction of the birth dose beyond hospitals and clinics becomes feasible.

### Human Resource Issues

**There will need to be investments in training hospital delivery room staff in hepatitis B birth dose administration**

Mobilising human resources from within and outside the traditional immunization programme to address the challenges of the birth dose also represents a fundamental constraint to implementing the Regional Plan. The on-going capacity development needs, especially of point-of-delivery staff, as well as logistics and cold chain staff, will require regular, programmed, in-service training. This represents a significant demand on scarce resources for national immunization programme and in-patient facility managers.

Specifically, there will almost certainly need to be investments in training hospital and clinic delivery room staff in hepatitis B birth dose administration and the associated injection safety and medical waste disposal procedures. In addition, once policy and procedural matters are resolved concerning the use of the vaccine beyond the cold chain, mobilising for training of

community midwives and traditional birth attendants will require focused effort and add to demand on scarce resources. The lack of resources for this training represents a constraint to the implementation of the Regional Plan.

### Monitoring Immunization Performance

**Hepatitis B control programs must rely for the present on secondary indicators, principally coverage data, as proxies for the actual milestone**

The milestone for country performance in controlling hepatitis B is a carefully defined serological datum - **HBsAg < 1% in five-year-olds born after commencement of routine vaccination**. However, there is very little population-based hepatitis B sero-epidemiological information available in the Region and there are very few countries currently able to routinely monitor population-based hepatitis B serological markers. For the present, hepatitis B control programs must rely on secondary indicators, principally coverage data, as proxies for the actual milestone. This is less than satisfactory,

given the long history of poor quality of reported coverage data throughout the Region and it constitutes a weakness in the implementation of the Regional Plan.

Although there is a general lack of quality sero-epidemiological data for hepatitis B within the Region, there are numerous elements within the health systems of many countries producing point or trend hepatitis B data. These include blood banks, antenatal clinics, STI clinics, harm reduction facilities, hospital laboratories and other testing agencies. However, there is no current expert consensus on the potential usefulness of these data as an element in tracking the impact of immunization. Such a consensus has the potential to contribute to more confidence among national immunization program managers of the usefulness of the Regional Plan.

## Advocacy, Social Mobilization and Demand Creation

**There is a sense in which the historically vertical approaches of EPI and the autonomous nature of many national immunization programmes are constraints to multi-sectoral actions.**

Hepatitis B is a virtually invisible childhood infection. It is vital to develop special advocacy efforts for promotion of its control by immunization. Such advocacy and communication efforts optimally need to be undertaken in the wider context of averting maternal and neonatal death and disability and will, of necessity, involve a broader stakeholder constituency. There is a sense in which the historically vertical approaches of EPI and the autonomous nature of many national immunization programmes are constraints to multi-sectoral actions.

However organized, special communication messages are needed to create demand among parents and carers for the timely birth dose. Among countries in the Region, very few have focused strategically on social mobilization and demand creation. In addition, the poor availability of effective health promotion materials in most priority countries is a constraint to the implementation of the Regional Plan.



There is recent evidence from Vietnam that vaccine manufacturer advertising can be useful in the creation of birth dose demand. This may present opportunities at the wider Regional level.

### In Summary

Country-level constraints to the effective implementation of the Regional Plan to improve hepatitis B control exist across the spectrum of immunization systems functions. These include:

- Added stress of hepatitis B vaccination on routine immunization delivery
- Need for functioning birth registers
- Need for policy guidelines and operating procedures for birth dose delivery
- Need for policy and procedures development for beyond-cold-chain use of monovalent hepatitis B vaccine

- Need for human resource development, especially outside the traditional immunization program
- Need for clarity in the use of serological measures and proxy indicators of immunization program performance
- Need for innovation in social mobilization and vaccine demand creation

In one sense, these constraints are also opportunities to address the need for fundamental changes in immunization practice, in line with changes to health systems in many of the Region's countries. While striving to achieve the routine delivery of three doses of vaccine to every child is the priority, a parallel key focus on the gradual introduction of a birth dose is critical. This is because, with hepatitis B control, simply doing more of the same will not produce the required results. New strategies, new partners and new players are needed to achieve the milestone.

## **Next Steps**

There are a number of practical steps that can be taken, at Region and country levels, to improve hepatitis B control by immunization. An important first step is to gain a general consensus among countries with similar problems on the overall approach to addressing the fundamental policy, procedural and operational constraints limiting the implementation of the Regional Plan. In this way, the constraints identified can be better addressed in a focused, structured and logical manner.

### **Step 1**

Conduct a workshop for countries with a high proportion of out-of-hospital births (Cambodia, Vietnam, Lao PDR, Mongolia, China, Philippines) to develop practical models for addressing key policy, procedural and operational constraints in areas including:

- Data quality
- Data usage
- Birth registration
- Birth dose responsibility
- Beyond-Cold-Chain use of vaccines

Include Child Health, Safe Motherhood and Reproductive Health Units from WPRO and representation from UNICEF as participants to broaden the experience base.

## Step 2

Develop pilot projects in participating countries for policy/procedures review and monitor the impact of new or revised policy on immunization practice, with foci notionally including:

- Data quality self-assessments in selected provinces/districts targeted for hepatitis B vaccine introduction and/or birth dose introduction
- Data quality improvement workshops following the assessments, with a focus on strengthening routine hepatitis B coverage reporting and birth dose monitoring in each selected province/district
- Birth-related information systems development
- Beyond-cold-chain trials for vaccines including HepB and TT

## Step 3

Undertake country-level training needs assessments for hepatitis B vaccine administration and associated injection safety and waste disposal procedures for hospital and clinic delivery room staff and support training with technical assistance as required.

## Step 4

Assess the usefulness of hepatitis B trend /convenience data in tracking hepatitis B immunization performance in two pilot countries (Philippines, China) and establish the basis and frequency for undertaking population-based serological immunization impact assessments.

## Step 5

Develop a model framework for using hepatitis B trend/convenience serological data across the Region and support countries wishing to undertake timely population-based serological immunization impact assessments.

### Step 6

In each participating country, undertake an assessment of the usefulness of existing social mobilization / demand creation strategies for hepatitis B birth dose.

### Step 7

Develop country-specific social mobilization / demand creation programs targeting birth dose.

### Step 8

Conduct a second workshop for countries with a high proportion of out-of-hospital births one year after the first to review progress and recommend next steps.