Global Epidemiology and Prevention of Hepatitis B

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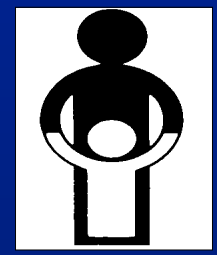
WHO Geneva

Strengthening immunisation systems and introduction of hepatitis B vaccine in Central and Eastern Europe and the Newly Independent States, 3rd meeting, Kyiv, Ukraine

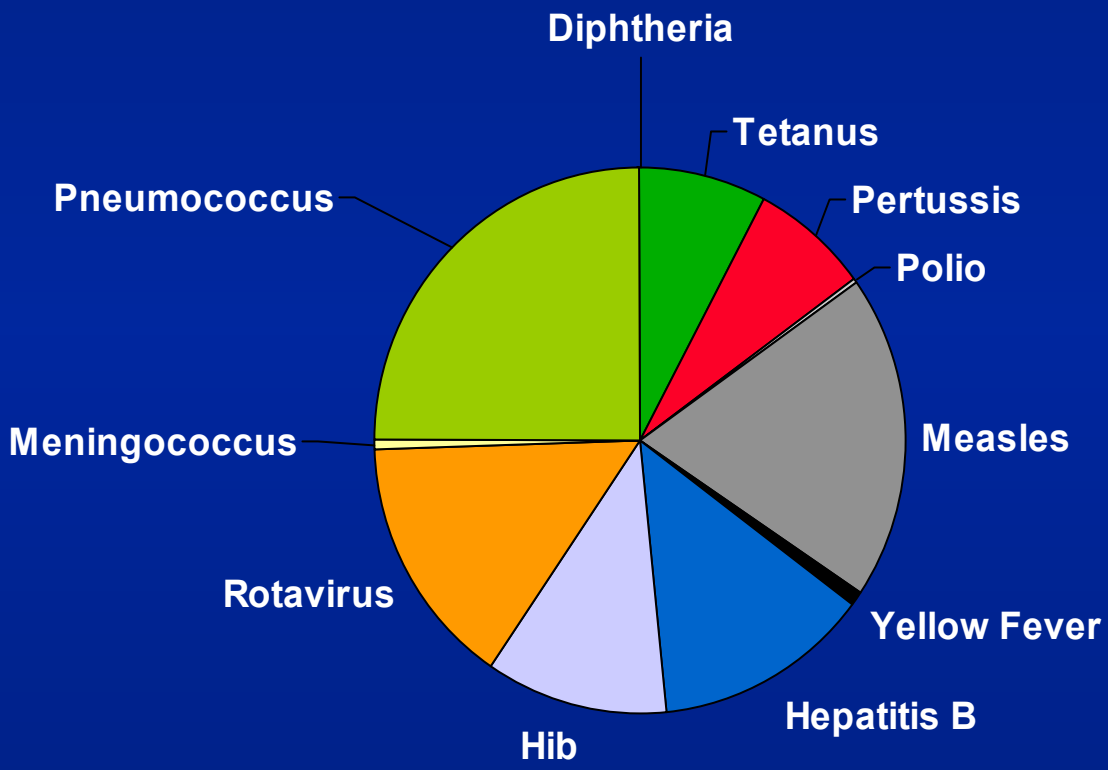
May 26, 2004



Global Disease Burden

- Estimated 2 billion people infected with HBV
- More than 350 million have chronic HBV infection
- Approximately 88% of the world's population live in areas where the prevalence of chronic HBV infection is high (>8% HBsAg +) or moderate (2-7% HBsAg +)
- Estimated 600 000 HBV-related deaths in 2002
- Approximately 93% of deaths were the result of chronic infection

Deaths from Vaccine-Preventable Diseases

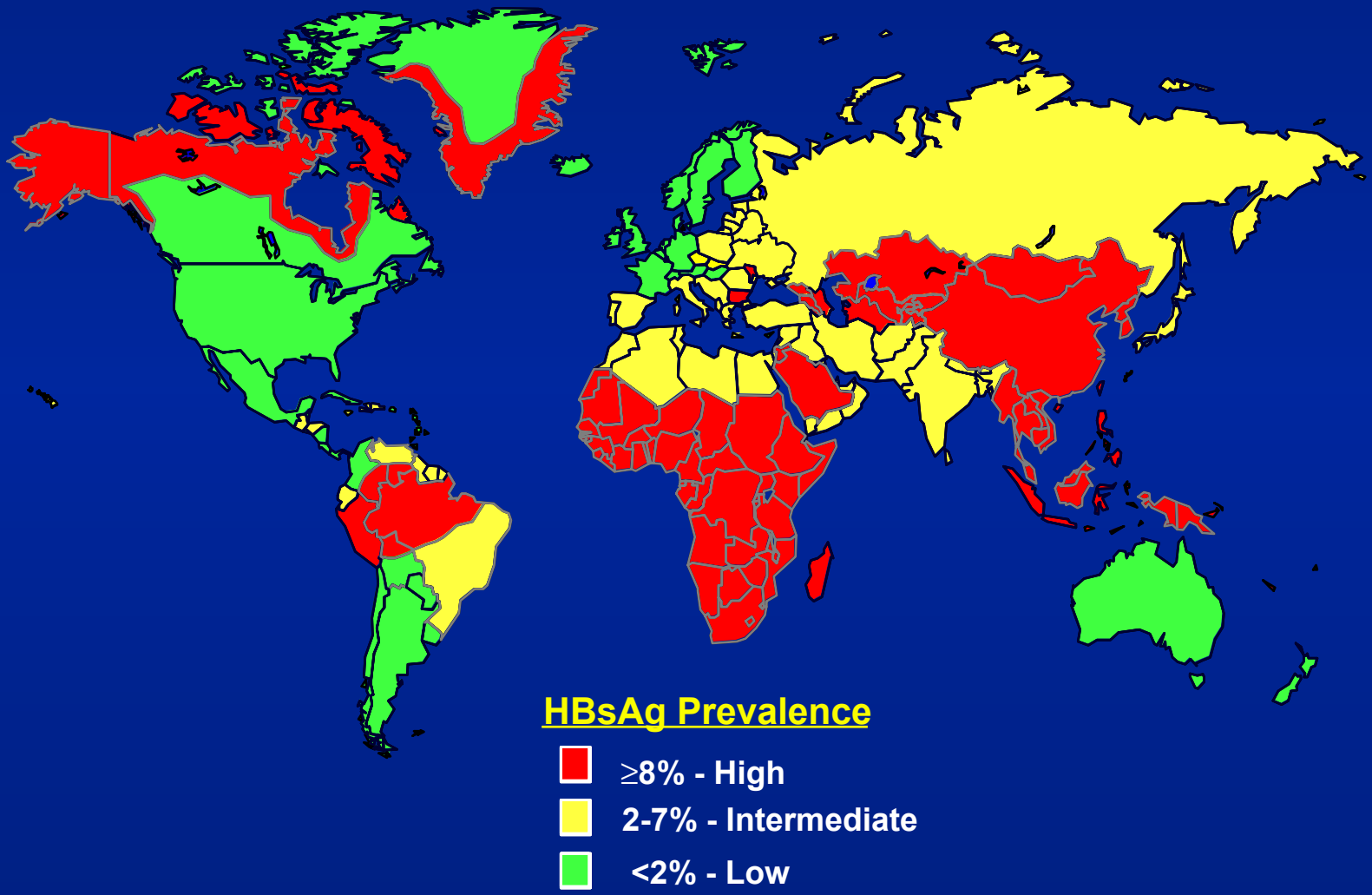


4 Million Deaths to Be Prevented (2000 estimates)

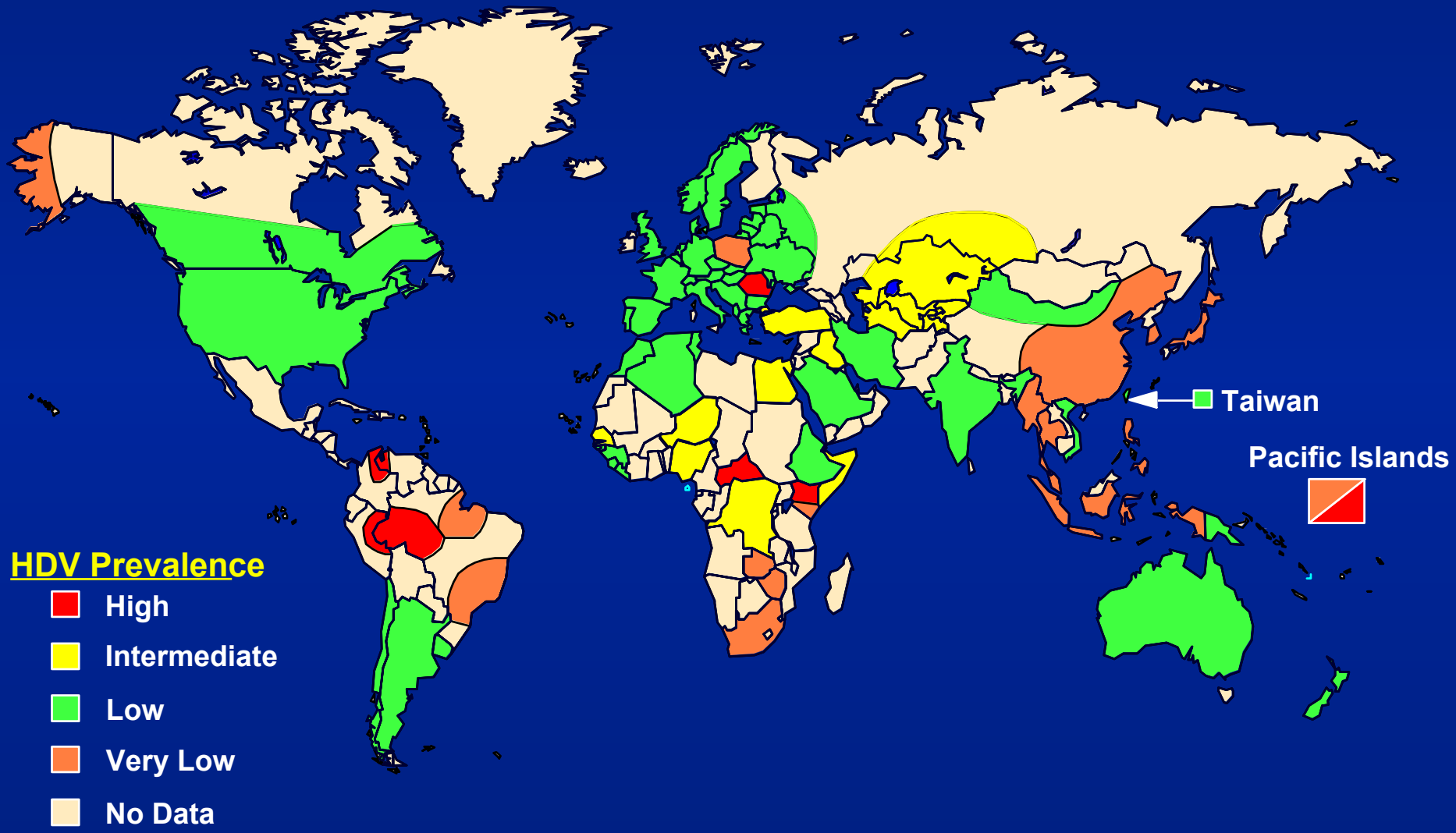
Global Pattern of HBV Infection

Endemicity	% World's Population	Lifetime Risk of Infection	Primary Age at Infection
High	45%	>60%	Perinatal Early childhood
Intermediate	43%	20-60%	All ages
Low	12%	<20%	Adults

Geographic Distribution of Chronic HBV Infection



Geographic Distribution of HDV Infection



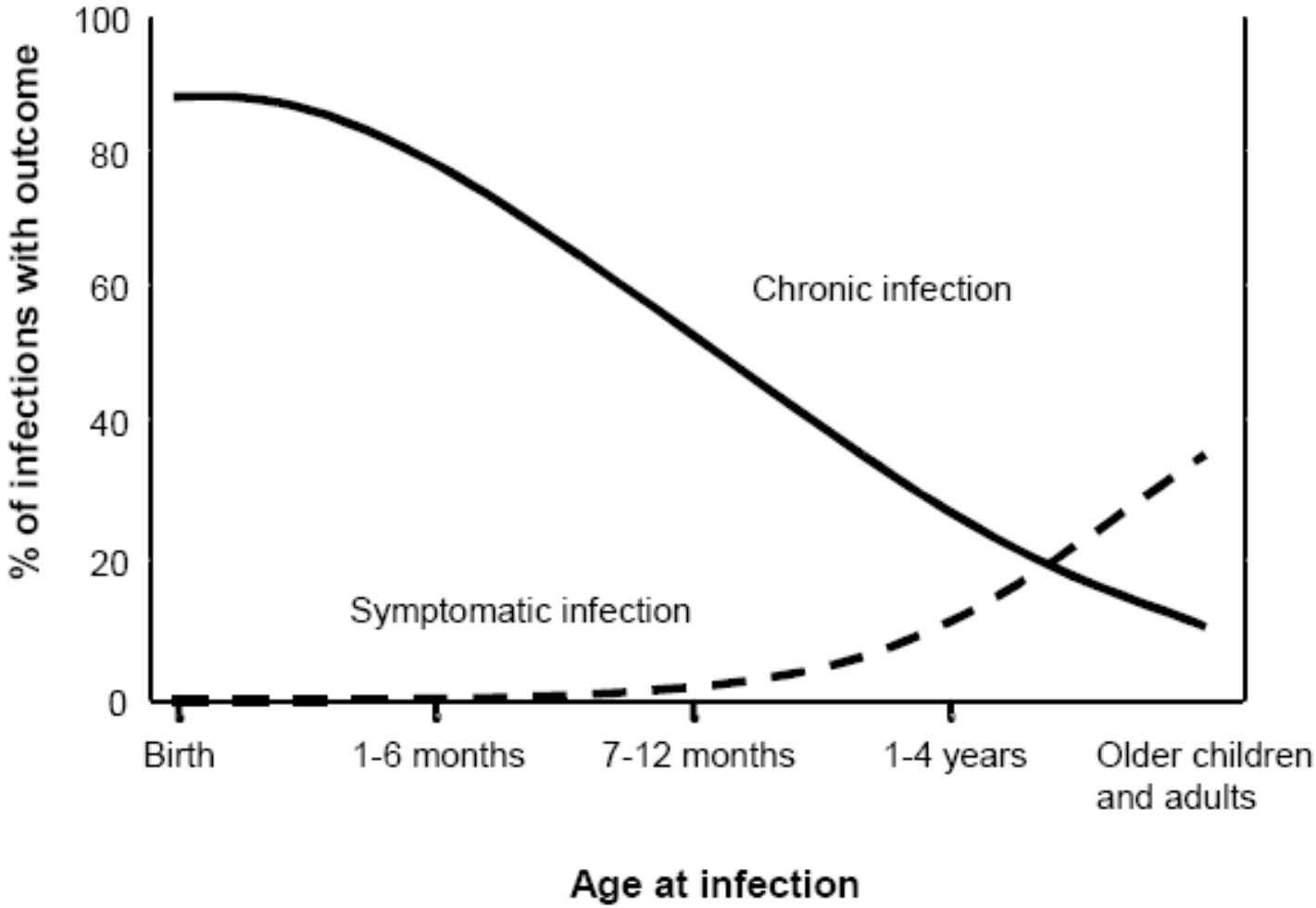
Primary Modes of HBV Transmission by Age Group

Age Group	Primary Mode of Transmission
Birth	• Perinatal
Early childhood	• Unsafe injections • Inapparent parenteral (horizontal)
Late childhood, adolescence, adulthood	• Unsafe injections • Sexual • Injection drug use

Epidemiology of Chronic Infection

- Most HBV infections occur in perinatal period/early childhood
- Infections at this early age lead to high proportion chronic infections
- Large proportion of chronic infections unrecognized and lead to long-term complications (cirrhosis and HCC)
- ~21% of HBV-related deaths result from infection in perinatal period
- ~48% from infection in early childhood (age <5 years)

Figure 1. Outcome of hepatitis B virus infection by age at infection



WHO Objectives

- In 1992, WHO set goal: all countries integrate hepatitis B vaccination into EPI by 1997
- Primary objective to prevent chronic HBV infection, disease and death
- Secondary objective to prevent acute hepatitis B

WHO Strategy

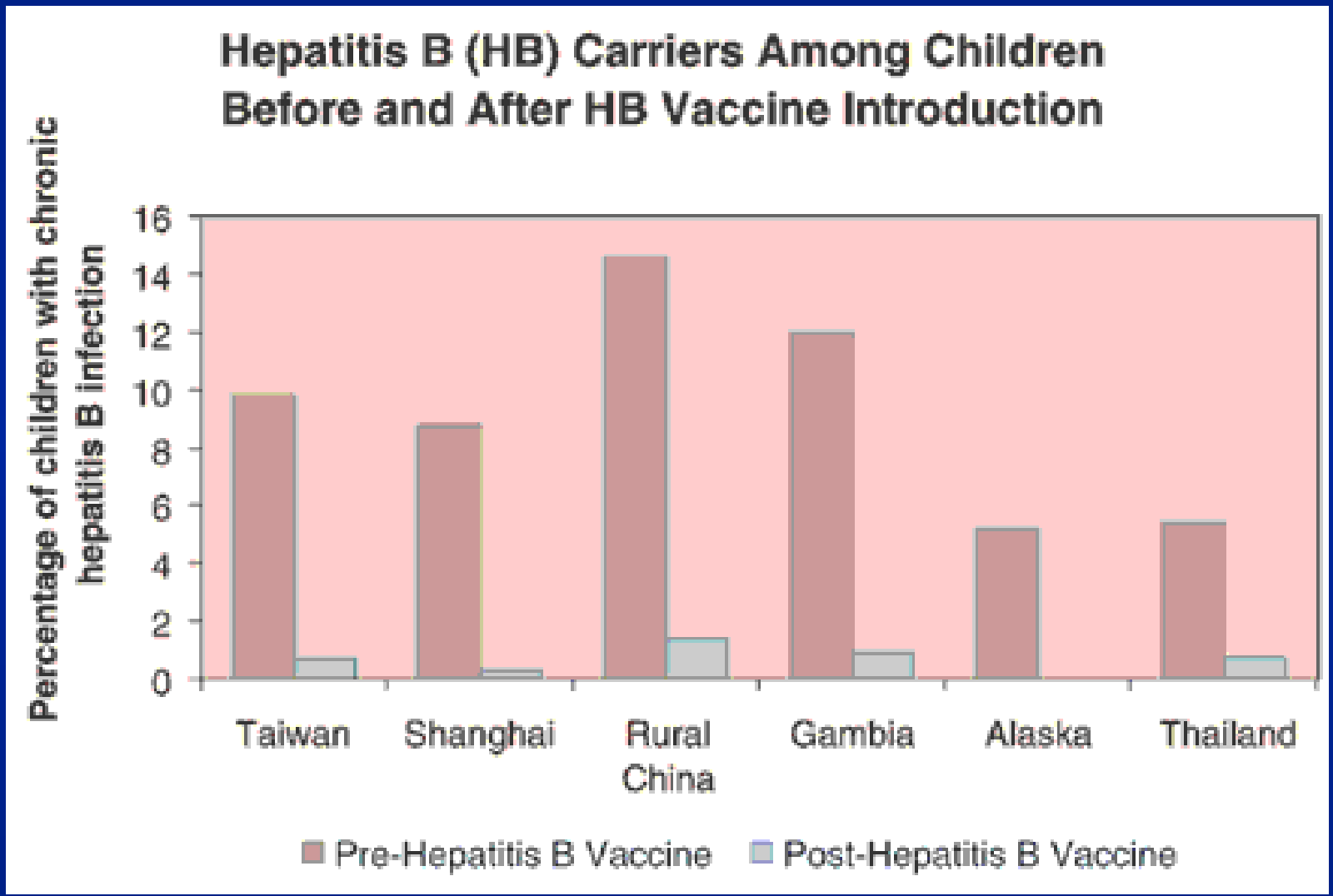
- Vaccination of infants and children is highest priority for hepatitis B programs
- 3 doses of hepatitis B vaccine 90%–95% effective in preventing HBV infection and chronic sequelae
- To prevent perinatal HBV transmission, 1st dose vaccine should be given within 24 hours after birth—the birth dose

Priorities

- Priorities for hepatitis B immunization in order of importance are:
  - routine infant vaccination;
  - prevention of perinatal HBV transmission (the birth dose);
  - catch-up vaccination for older age groups.

Impact of Vaccination

- Effective implementation of hepatitis B immunization has been shown to dramatically decrease the prevalence of chronic HBV infection and the incidence of HCC
- Gambia prevalence chronic infection among children declined from 10% to 0.6%
- Alaskan villages prevalence of HBV infection from 16% to ~0%
- Similar impact on chronic infection demonstrated in China, Indonesia, Senegal, and Thailand


Hepatitis B (HB) Carriers Among Children
Before and After HB Vaccine Introduction
Percentage of children with chronic hepatitis B infection
16
14
12
10
8
6
4
2
0
Taiwan
Shanghai
Rural China
Gambia
Alaska
Thailand
Pre-Hepatitis B Vaccine
Post-Hepatitis B Vaccine

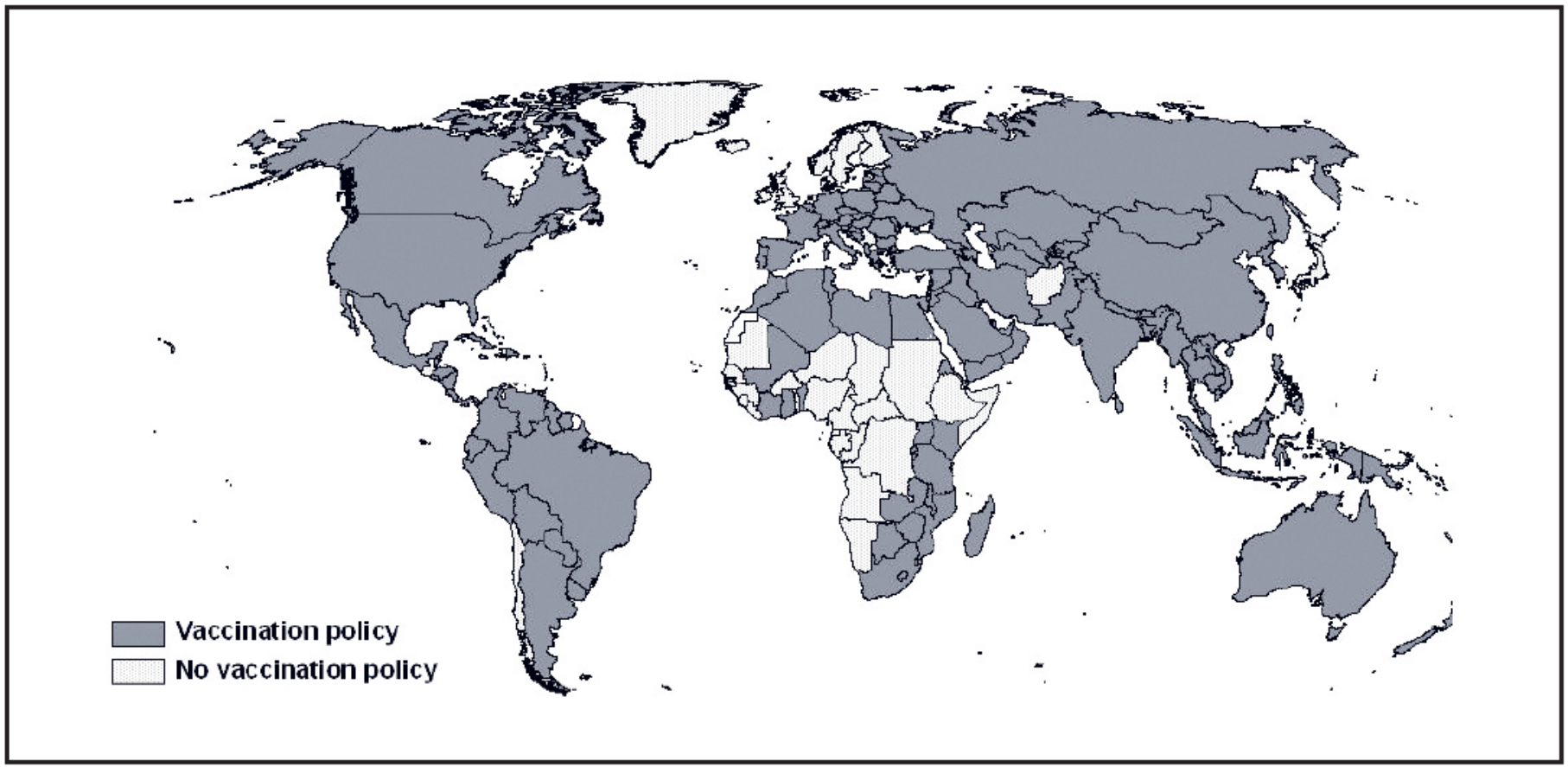
Barriers and Progress

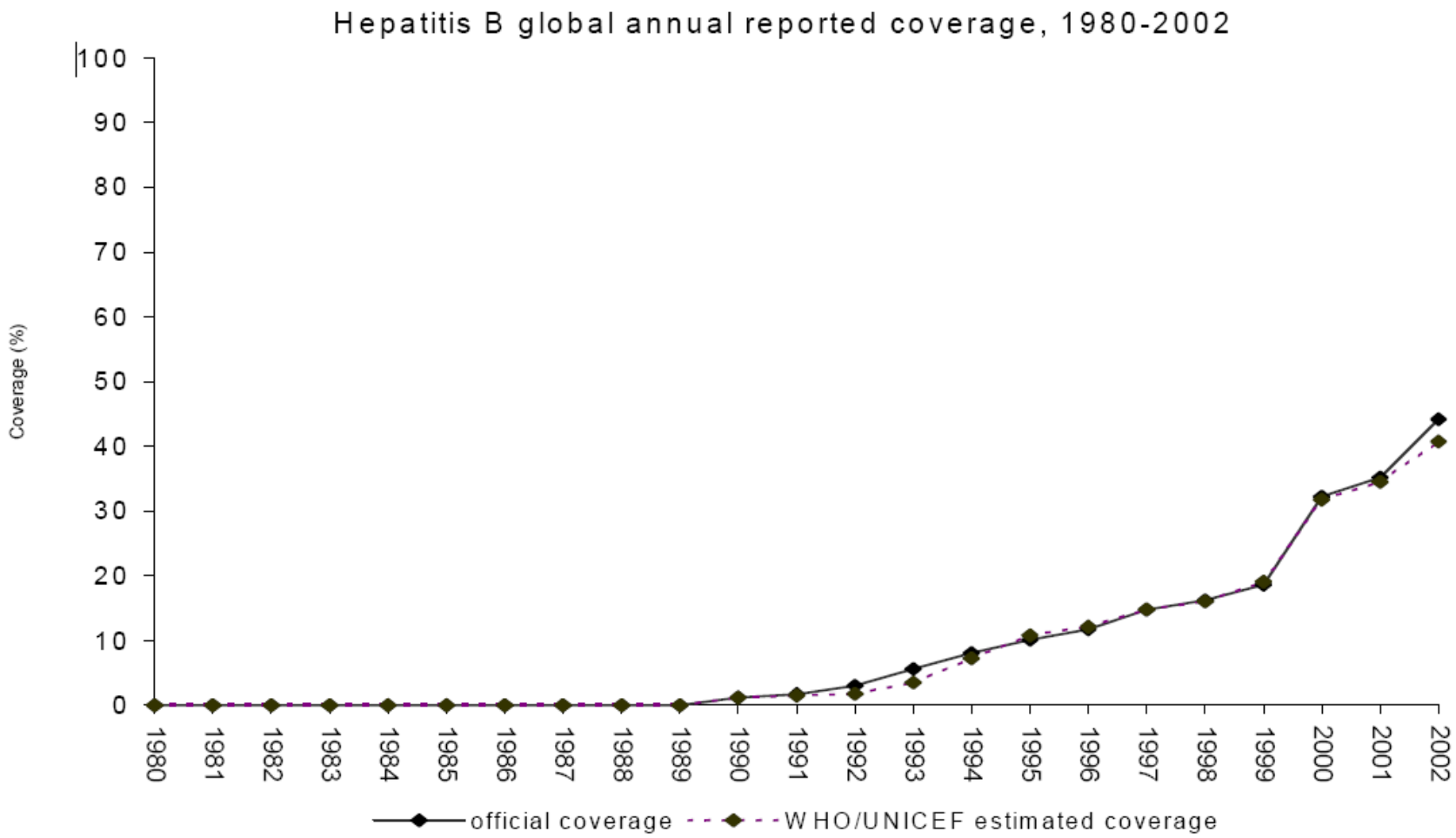
- Historically, 3 major barriers to introduction HepB:
  - high cost of vaccines,
  - poor immunization infrastructure, and
  - lack of recognition of disease burden, esp in children
- Progress being made:
  - Price of monovalent HepB from ~USD 3.00/dose 1990 to USD 0.27/dose 2004
  - Recent GAVI/VF support critical in accelerating the introduction

Global Progress

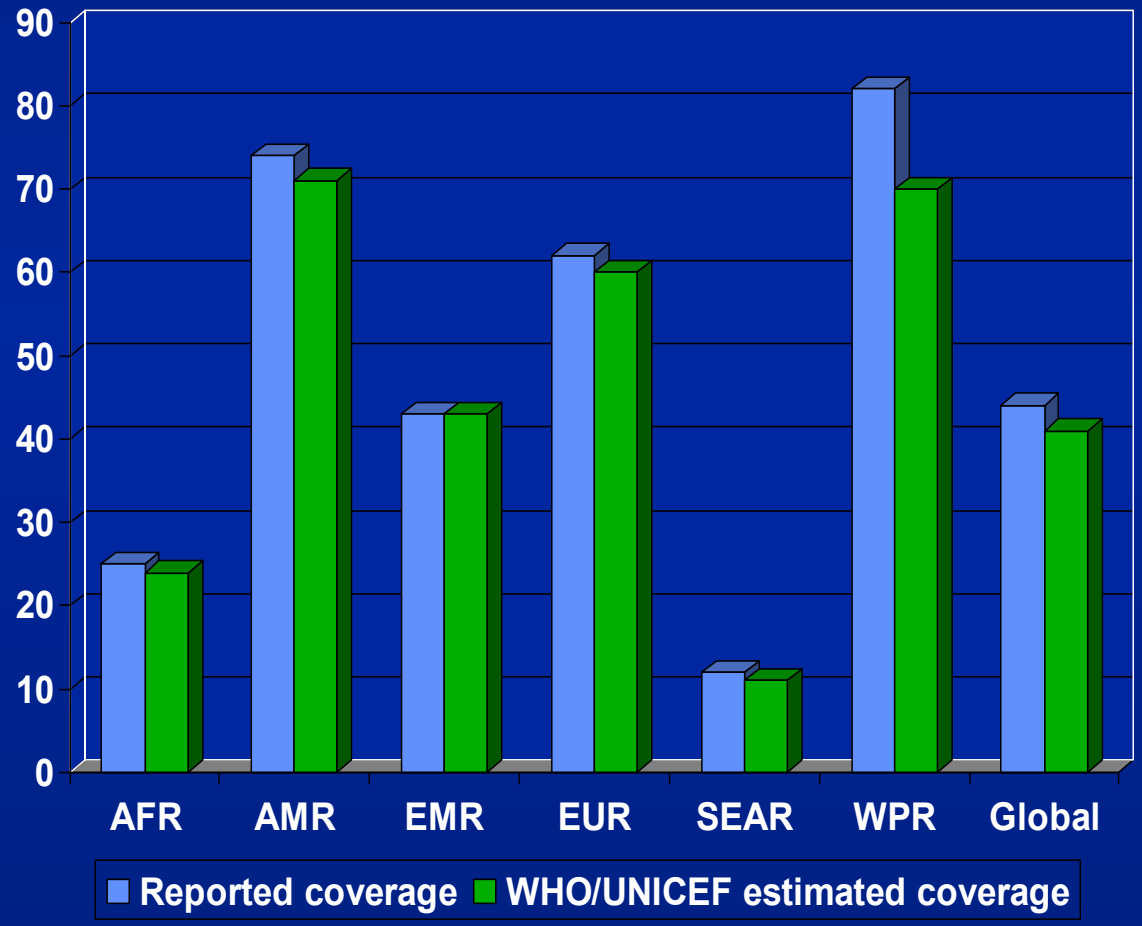
- WHO goal for integratration of HepB into EPI by 1997 not achieved, however,
  - By 2002, 141 of 192 (73%) WHO Member States had introduced
  - 41% of the world's children less than 1 year of age had been fully vaccinated
  - Coverage by WHO region: WPR 70%; AMR 71%; EUR 60%; EMR 43%; SEAR 11%; and AFR 24%
  - Of 137 Member States that introduced and data available, 76 (55%) have birth dose
- Global goals are now introduction HepB in all countries by 2007 and coverage HepB3 90% by 2010

FIGURE. World Health Organization member states with universal infant or childhood hepatitis B vaccination programs, 2003




Hepatitis B global annual reported coverage, 1980-2002
Coverage (%)
100
90
80
70
60
50
40
30
20
10
0
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
official coverage
WHO/UNICEF estimated coverage

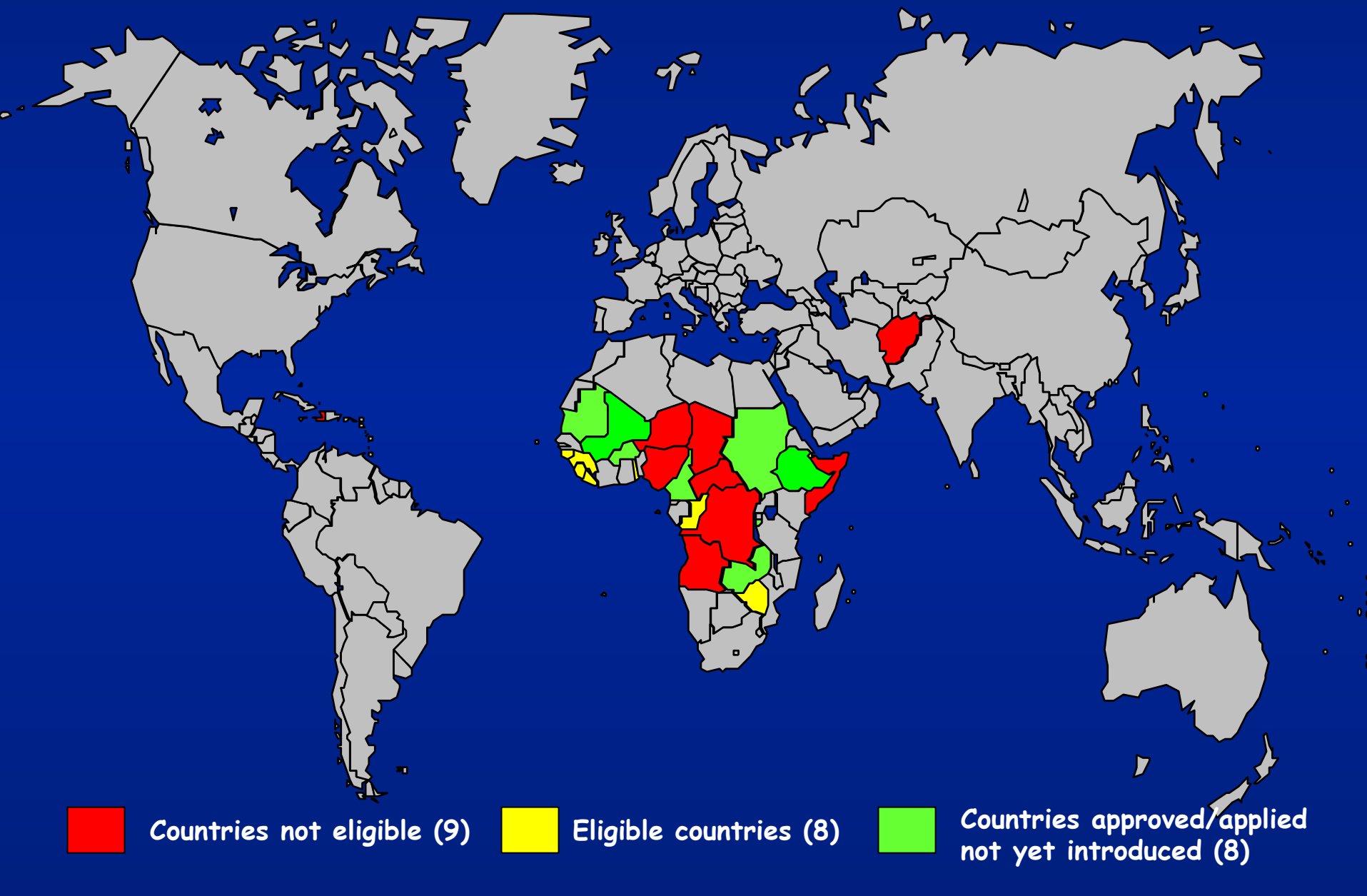
WHO Regional Vaccination coverage (%)
HepB3 < 1 year of age: 2002



Challenges

- Countries eligible for GAVI/VF support to develop plans and apply
- Countries with DTP3 coverage < 50% develop plans to strengthen immunization systems
- Countries ensure coverage HepB3 = DTP3 and increase coverage with both to > 90%

Status of GAVI/Vaccine Fund Support for Hepatitis B Vaccine--May 2004



Other Challenges

- Delivery of Birth Dose
  - In countries with high proportion infants born in facilities/home with TBAs
  - In countries with large number home births not attended by trained person
- Prevention of vaccine freezing (shipment and storage)
- Decreasing wastage
- Catch-up immunization (older children and high-risk adults)
- Impact assessment
- Financial sustainability

Questions?