

# National program for surveillance and control of viral hepatitis

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# Legal requirements for reporting of infectious diseases

According to the Public Health Ordinance of 1940, physicians and diagnostic laboratories are required by law to notify the district health office of all cases of certain infectious diseases. The list of about 70 notifiable diseases is updated periodically.

# MOH surveillance

- Each notification indicates age, gender, nationality, address, date of onset, laboratory diagnostic test results, and prior vaccination history if known.
- Epidemiological investigations are conducted when needed by district health office staff.
- Notifications are processed nationally by the Division of Epidemiology and provide the basis for all incidence data and epidemiological analysis of illness among civilians
- The Division of Epidemiology summarizes the data and issues in both weekly and annual reports, as well as in reports to WHO and other international organizations.

# Quality of the data

- In passive surveillance, the extent of under-diagnosis and under-reporting is unknown. The information is useful for examining trends in morbidity. The validity of the reported data may be influenced by two factors:
  - The completeness of the reporting may differ among diseases and over the years. Case reporting during outbreaks is thought to be more complete than at other times
  - The classification of cases may change with time due to changes in diagnostic methods and/or definition of “cases”

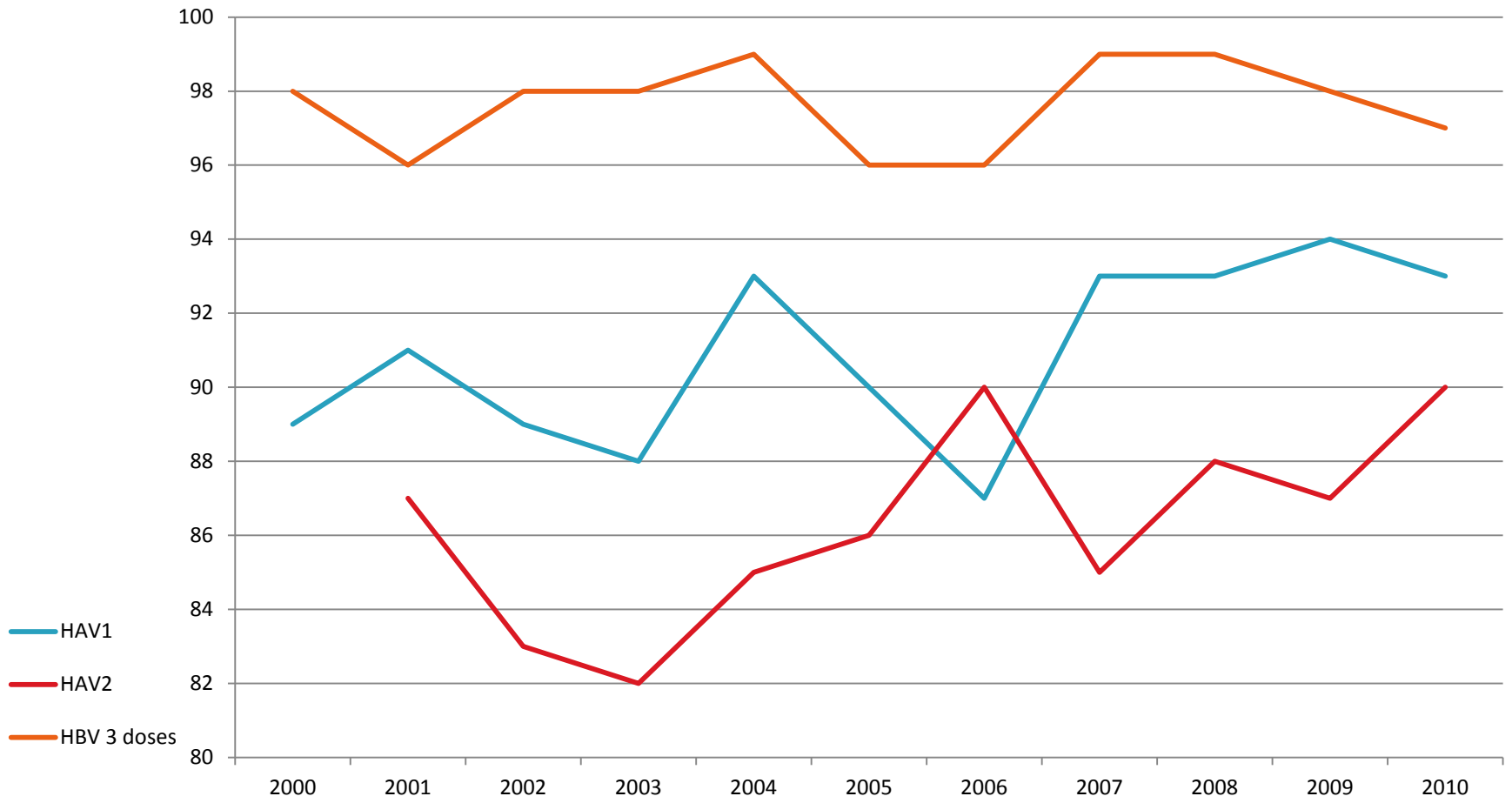
## Surveillance of viral hepatitis

- Reporting of acute viral hepatitis cases has been mandated since 1951
- Since 1993 reports are validated through serologic testing and hepatitis type: A, B, C, and other.
- Serologic and molecular diagnosis of HEV is performed in only one lab in Israel

## Vaccination Coverage

- Vaccination coverage estimates for the vaccines given in the first years of life are based on children registered in the Mother and Child health clinics. 93% of children are registered in these clinics
- Vaccination coverage for the vaccines given at school are submitted to the Ministry of Health by the student health services

# HAV & HBV National Vaccine Coverage, 2000-2010

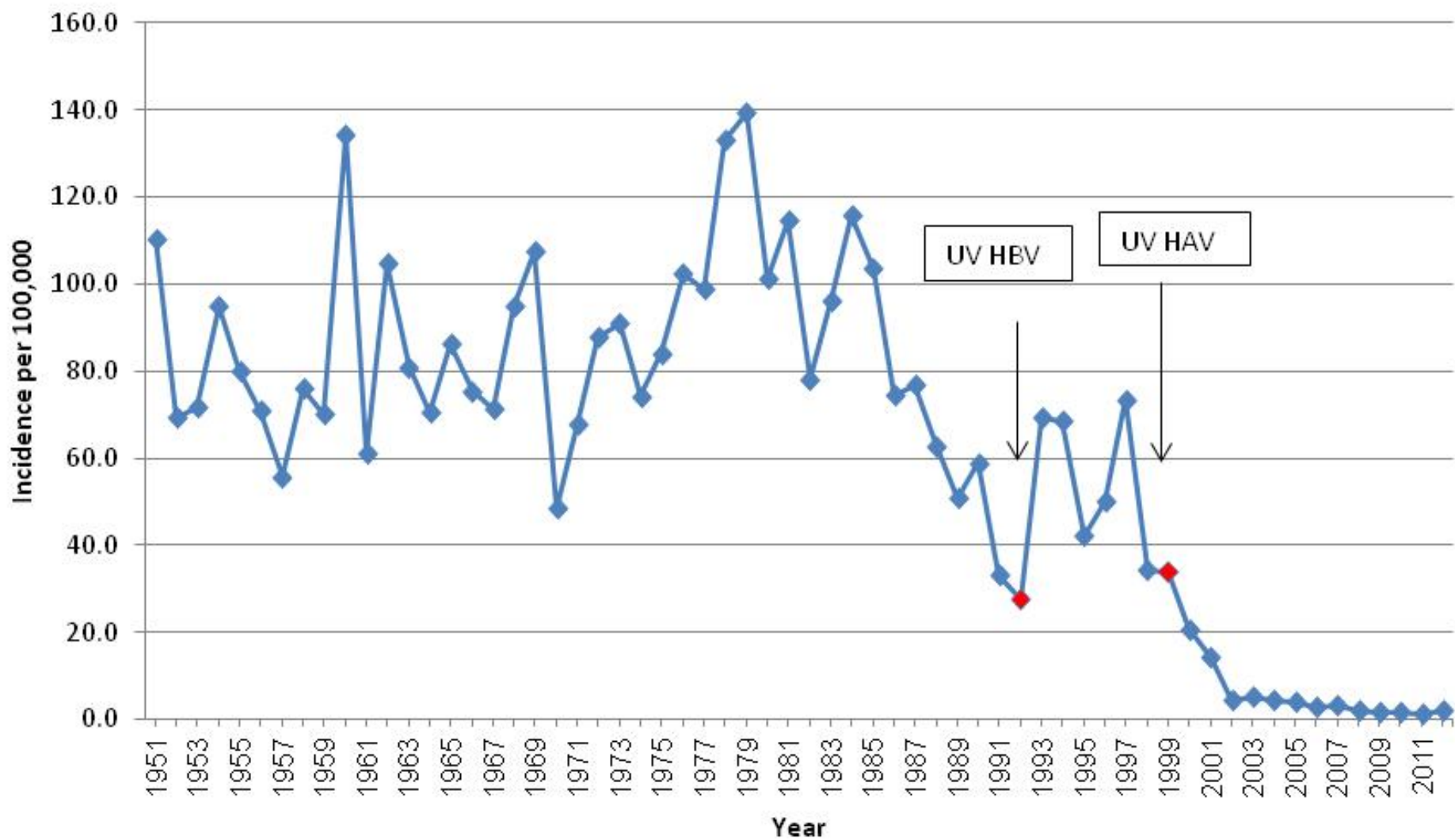


# National Immunization Registry

- A National Immunization Registry for childhood immunization is being developed and is close to be completed.
- It is intended to provide information regarding each individual, as well as reports on vaccine coverage, side effects, refusal to be vaccinated, etc.



## Annual incidence of viral hepatitis, Israel 1951-2012



# Hepatitis A

Will be covered in the epidemiology  
and vaccination sessions

HBV

# Epidemiology HBV

- What cases of HBV are reported?
  - Acute HBV cases

*(Chronic HBV is not reportable to MOH)*

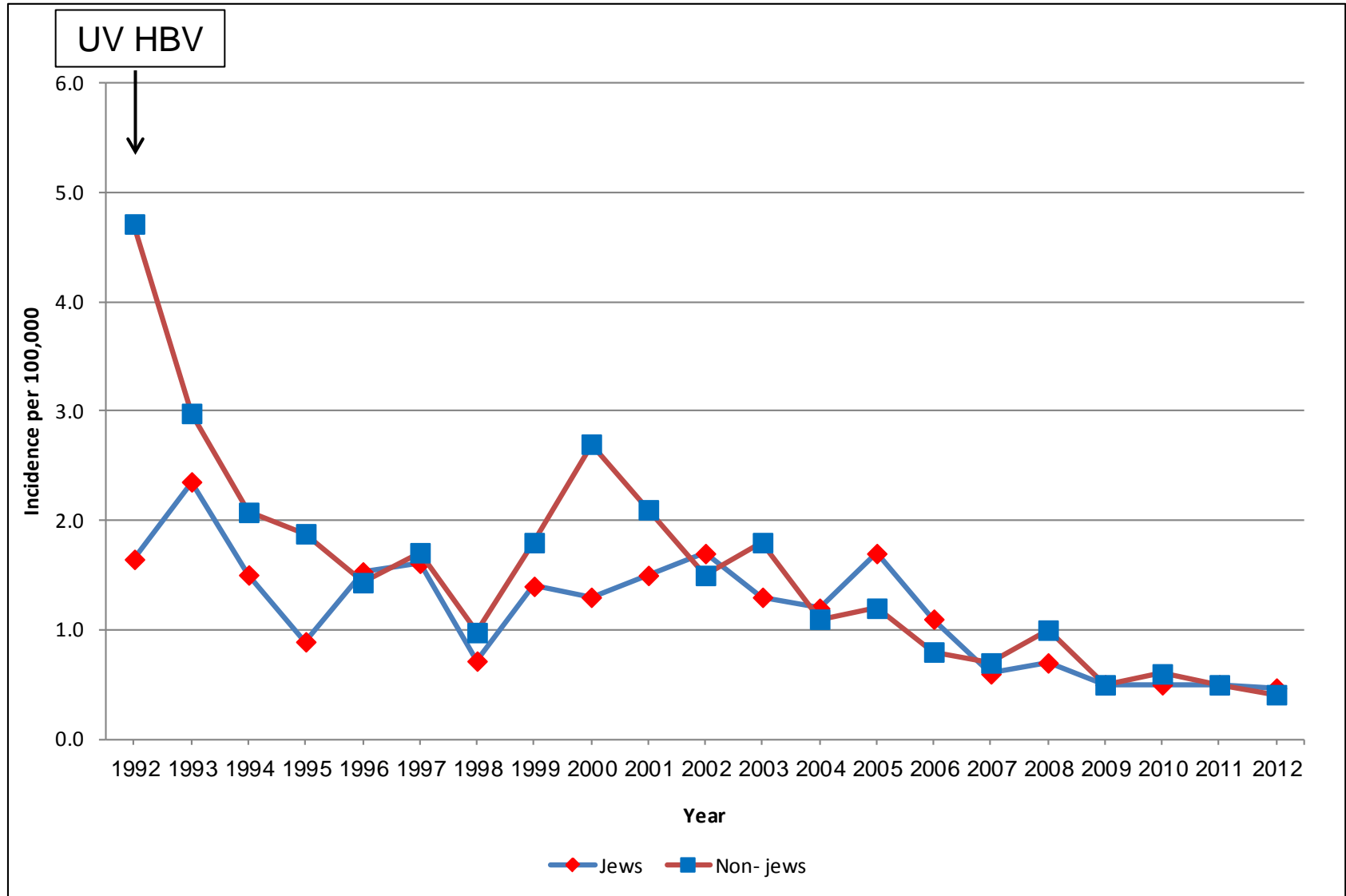
## What is the case definition used for acute HBV?

- Positive HBs Ag in the presence of laboratory evidence for hepatitis
- Positive IgM anti-HBc
- HBV-DNA by PCR: In special cases (i.e. suspected occult HBV, evidence for hepatitis in immune suppressed individuals or suspected emergence of escape mutants)

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*\* MOH prevalence data on HBV markers in the general population are scarce and most data are received from screening of blood donors and special populations at risk. However, data on prevalence of HBV markers in the general population are now being collected through the laboratories of the individual insurers*

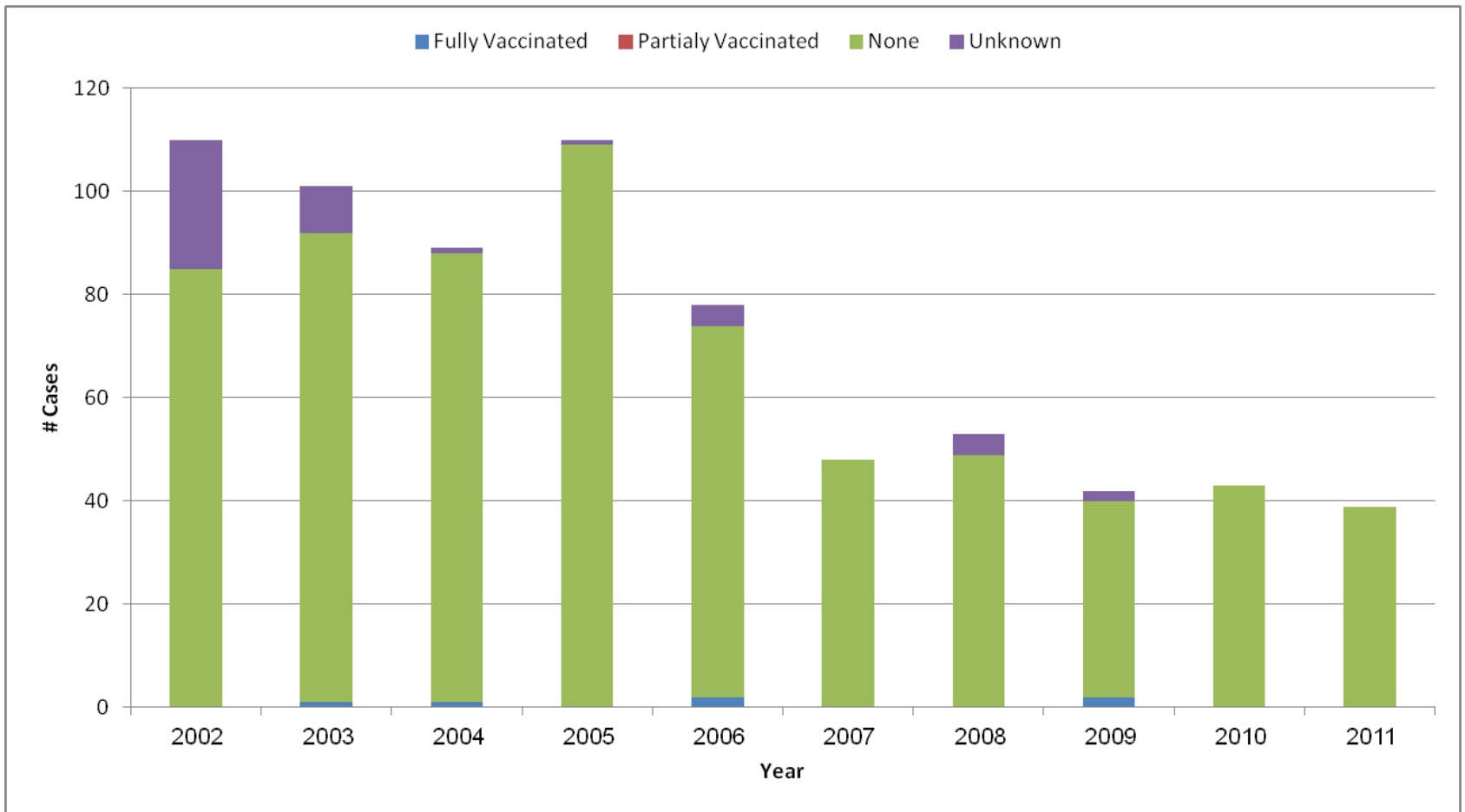
# Incidence of acute HBV in Israel, 1992 – 2012, rate/100.000, by population groups



# Age Specific Incidence of acute HBV, rate/100,000, 1992 – 2012

Year	0	1-4	5-9	10-14	15-44	45-64	65+	Annual
<b>1992</b>	2.8	1.4	2.5	1.4	2.2	1.7	2.7	2.2
<b>1993</b>	0.9	0.5	2.3	0.8	2.5	2.7	1.6	2.5
<b>1994</b>	0.9	0.5	0.7	1.8	1.5	2.3	1.6	1.6
<b>1995</b>	0.0	0.2	0.7	0.8	1.1	1.1	1.5	1.1
<b>1996</b>	0.0	0.2	0.2	1.5	1.9	1.8	1.1	1.5
<b>1997</b>	0.0	0.2	0.7	0.9	1.9	1.7	3.1	1.6
<b>1998</b>	0.0	0.2	0.4	0.4	1.0	0.9	0.8	0.8
<b>1999</b>	1.5	0.2	0.7	1.1	1.9	1.5	1.5	1.5
<b>2000</b>	0.0	0.6	1.0	2.5	2.0	1.2	1.3	1.6
<b>2001</b>	1.5	0.2	0.0	1.2	2.2	2.1	2.1	1.7
<b>2002</b>	0.0	0.2	0.3	1.4	2.3	2.1	1.2	1.7
<b>2003</b>	0.0	0.0	0.0	0.3	2.5	1.6	1.2	1.5
<b>2004</b>	1.4	0.0	0.6	0.7	1.6	1.2	1.6	1.2
<b>2005</b>	1.4	0.0	0.0	0.2	2.2	2.6	0.9	1.6
<b>2006</b>	0.7	0.0	0.0	0.3	1.8	0.7	0.9	1.0
<b>2007</b>	0.0	0.2	0.0	0.5	1.0	0.6	0.3	0.6
<b>2008</b>	0.0	0.0	0.0	0.2	1.1	0.9	0.7	0.7
<b>2009</b>	0.0	0.0	0.0	0.0	1.0	0.7	0.0	0.6
<b>2010</b>	0.0	0.0	0.0	0.0	1.1	0.3	0.4	0.6
<b>2011</b>	0.6	0.2	0.0	0.0	0.6	0.9	0.1	0.5
<b>2012</b>	0.0	0.0	0.0	0.0	0.7	0.5	0.5	0.5

# HBV cases by vaccination status



# Detection of HBV

- **HBsAg testing of all blood products introduced in the early 1970s and later improved using state of the art assays available at the particular time period**
- **Testing was gradually expanded to healthcare workers, patients on dialysis, immune suppressed patients and various risk groups (i.e. IVDA)**
- **HBV-DNA testing introduced in special laboratories in the mid 1990s has been available since ~ 2005 at all HMO laboratories**
- **NAT testing for HBV, HCV and HIV introduced into blood banks in 2008** (*Detection of 1 case per 900,000 samples during window period*)



# Historical data on prevalence of HBV markers in population studies

- A study of 9162 elementary school children in 1976 tested by counter electrophoresis for HBsAg revealed an overall HBsAg carrier rate of **1.8%** (2.2% M, 1.4%F). The highest rates were detected in children of Lybian origin (3.9%), Yemen (2.6%) in contrast to children born in Israel (0.2%).
- In 1987, HBsAg+ was identified in **5%** of 1480 military recruits
- In 1991 HBsAg+ was detected in **0.88%** of pregnant women in Jerusalem (with a 4.3% rate in women of Moslem origin)

# HBV prevention policies

## Primary prevention:

- Screening of blood/blood products
- Immunization
  - Universal immunization since 1992
    - Infant/newborn schedule:birth ,1m and 6m coverage HBV dose 3: 98%
    - children and adolescents up to age 17y catch up recommended, no coverage data

## HBV screening policies

- Household contacts of HBsAg carriers
- Pregnant women at high risk
- Health care workers performing EPP\*
- Patients undergoing hemodialysis
- Patients visiting Drug and STD clinics
- Recipients of multiple blood product transfusions
- Organ transplant donors and recipients
- Donor and host before stem cell and marrow transplantation
- Candidates for in-vitro fertilization

## High risk groups for whom HBV immunization is recommended

- Newborns to HBsAg + women
- Health care professionals and those with occupational exposure to blood\*
- International travelers to hepatitis B endemic countries
- Patients undergoing hemodialysis
- Patients undergoing multiple blood or blood products transfusions
- Intra venous drug users
- Men having sex with men
- HIV positive patients
- New visitors in STD clinics
- Household contacts and sexual partners of HBsAg-positive people
- Inmates
- Patients with chronic hepatitis

## Health care professionals

- ❑ *Students in the health care professions and health care professionals must present evidence for complete immunization against HBV.*
- ❑ *Physician and nurses engaged in exposure prone procedures must present evidence for post immunization protection.*
- ❑ *Those HBsAg positive HCW engaged in EPP ( Exposure Prone Procedures ) must show proof for suppression of HBV-DNA viral load <2,000 IU/ml*

# Post exposure prophylaxis:

- Health care worker exposed to HBV infected body-fluids
- Victims of sexual assaults
- Victims of terror attacks (exposure to tissue and bone fragments at suicide bombings )

HCV

# HCV-Surveillance

- Only acute HCV cases are reported; however, accuracy of reporting doubtful in view of the high rate of asymptomatic and subclinical infection
- There is no HCV patient registry for chronic HCV patients; yet substantial information is available on seroprevalence and demographics through the individual HMOs\*.
- **What is the case definition used?**
  - Positive anti-HCV confirmed by HCV RNA testing by PCR in a patient with previously normal liver functions who developed evidence for liver injury (ALT elevation)

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*\*The largest non-governmental data base is available at the Kupat Cholim HMO with 3.9 million insured patients at 2010. Cornberg M et al. Liver Int 2011;suppl 2 :30*

# Acute hepatitis C in Israel: a predominantly iatrogenic disease?

(A Retrospective multi-center survey)

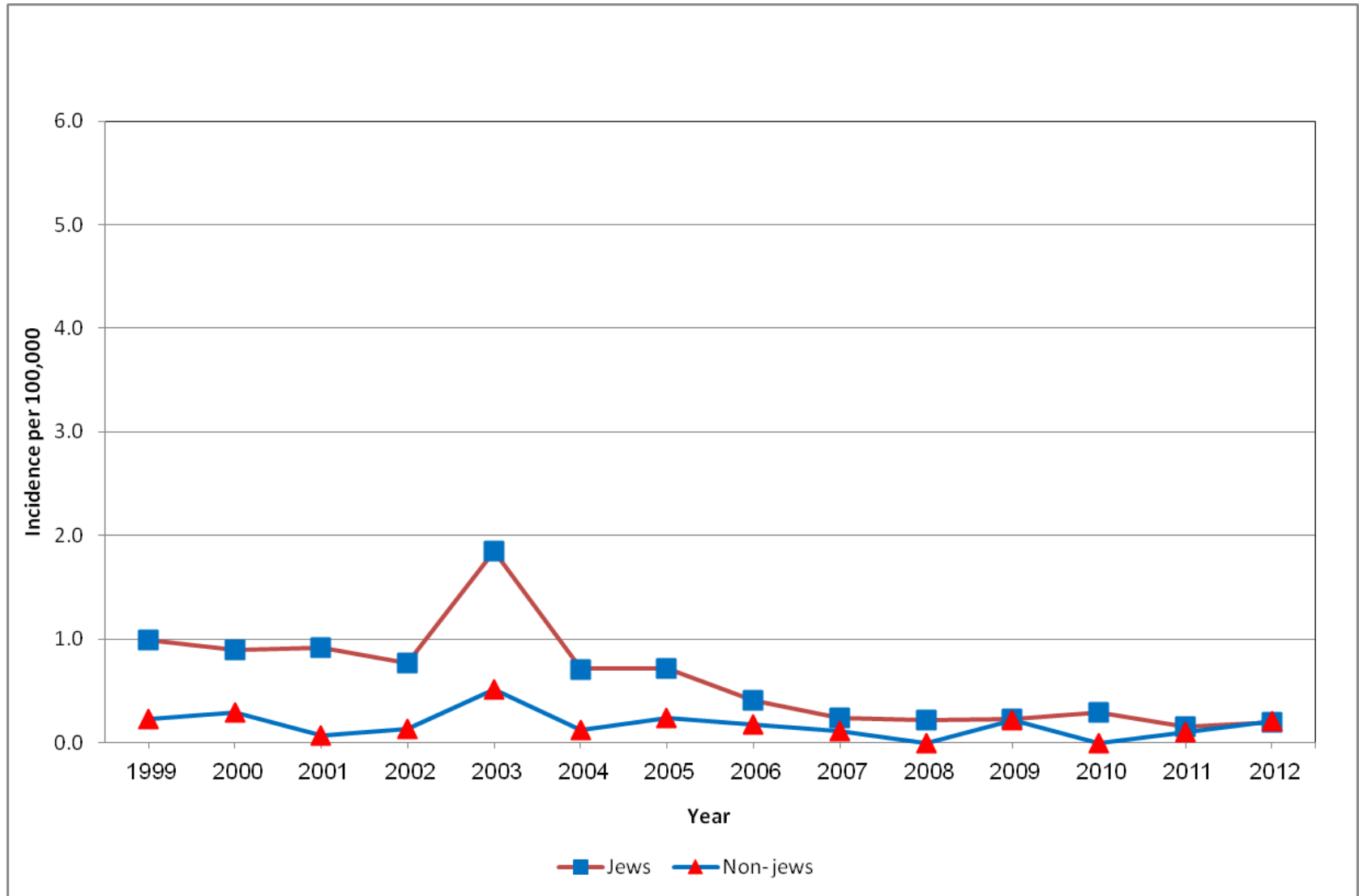
- In the era of universal screening of blood products iatrogenic transmission is still an important mode of transmission.
- Twenty-nine patients were found to have acute hepatitis C, representing 0.75% of all new referrals for hepatitis ( Most of them chronic HCV ).
- The most frequent mode of transmission was iatrogenic involving several, often minimal, procedures and clinical settings (65%)
- Injecting drug use was the second most common route of infection.
- Spontaneous seroconversion has occurred in approximately one third of the patients.



# Transmission of HCV by an anti-HCV+ IVDA anesthesiologist

- An anesthetist, who was an HCV carrier (2A/C genotype) and IV-drug abuser, exposed numerous patients to HCV between June 2001 – April 2003 in a tertiary hospital in Israel.
- A total of 35 HCV-positive patients with the same genotype (uncommon in Israel) were found among 1,200 exposed (attack rate = 2.8%).
- A case-control study strengthened this association (OR = 23).
- The fast intervention led to treatment of 33 patients ( 2 were not treatment candidates due to old age and co-morbidity ) of whom 32 recovered with SVR.
- The anesthetist was convicted in court and sentenced to 10 years in prison.

# Incidence of acute HCV in Israel 1999 – 2012, rate/100.000, by population groups



# HCV screening policies

- Patients with acute or chronic liver disease
- Patients undergoing hemodialysis
- Candidates for chemo/immuno therapy
- Candidates for in-vitro fertilization
- Donor and host prior to stem cells or marrow transplantation
- Organ transplant donors and recipients
- Injecting Drug Users
- STI clinic patients
- Household contacts
- Health care workers (recommended but not mandatory)

# HCV prevention policies

- Primary prevention:
  - Screening of blood/blood products
- Secondary prevention:
  - Post-Exposure follow up of health care workers following needle stick and similar injuries
  - Postexposure testing and treatment when indicated in patients exposed to HCV (accidental or transmission by HCWs)

# Estimated HBV and HCV Burden in Israel

- HBsAg carriers ~ 60-80,000 carriers
- HCV ~ 40-60,000 carriers

## Country's future needs

- Improvement in reporting rates and data-base analysis capabilities to monitor aspects of the morbidity related to hepatitis infections
- Quality control programs for assessment of immunization against HBV in the total population as well as in specific risk groups i.e. success in prevention of vertical transmission and long-term protection in vaccinees

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