

The national hepatitis A vaccination programme in Israel and the impact of universal immunization on the molecular epidemiology of HAV infection.

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# Hepatitis A Vaccine – Pre-exposure Prophylaxis

## Indications for Risk Groups

- Travelers to endemic countries
- Intravenous drug users
- Men who have sex with men
- Patients with chronic liver disease
- Candidates for liver transplantation
- Occupational risk (laboratory personnel involved in diagnosis of viral infections)

# Hepatitis A Vaccines

## Control and Prevention Strategies

- Immunization of defined risk groups
- Regional mass vaccination of pediatric subpopulations at risk
- Universal vaccination of toddlers
- Single-dose immunization
- Post-exposure prophylaxis and intervention in outbreaks

# Highlights of HAV Epidemiology in Israel

## Background

- Heterogeneous population ( contact between high and low socioeconomic risk groups)
- Highest attack rate in children 5-9 years old
- Maternal anti-HAV IgG is usually cleared in babies by the age of 18 months
- Hepatitis A is rarely observed < age of 18m
- Toddlers seem to be the main vehicle for HAV transmission (pilot study results)

# Israel: Childhood Hepatitis A Vaccination Program

- July 1999
- Vaccination of all 18 month old children
- Vaccine provided free of charge, as part of regular immunization program
- Estimated first dose coverage in vaccinated cohorts – 90%; second dose – 85%

# Universal Vaccination Against Hepatitis A


## Pros:

- Area of intermediate endemicity in transition
- Contact between populations with high and low risk
- True incidence >5x of reported cases/year through passive surveillance
- Increased incidence of fulminant hepatitis A
- Favorable cost/benefit analysis
- High acceptance by population

## Cons:

- Other priorities in allocation of healthcare funding

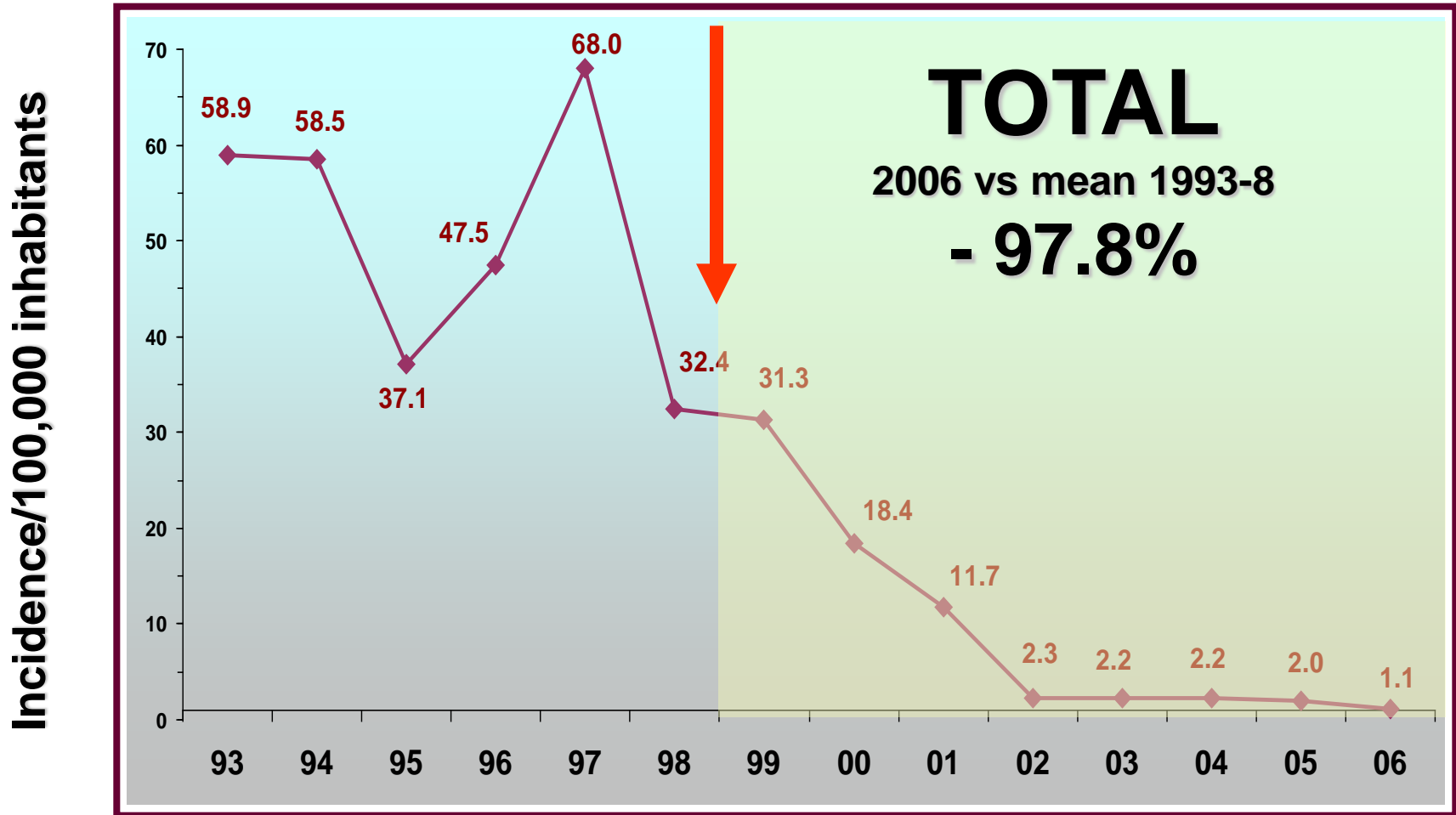
# Number of Acute Hepatitis A Cases in the Jerusalem District\*

<b>1999</b>	<b>671</b>	
<b>2000</b>	<b>654</b>	
<b>2001</b>	<b>420</b>	
<b>2002</b>	<b>46</b>	
<b>2003</b>	<b>67</b>	
<b>2004</b>	<b>50</b>	
<b>Total</b>	<b>1908</b>	

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\*Through active surveillance in a population of ~900,000

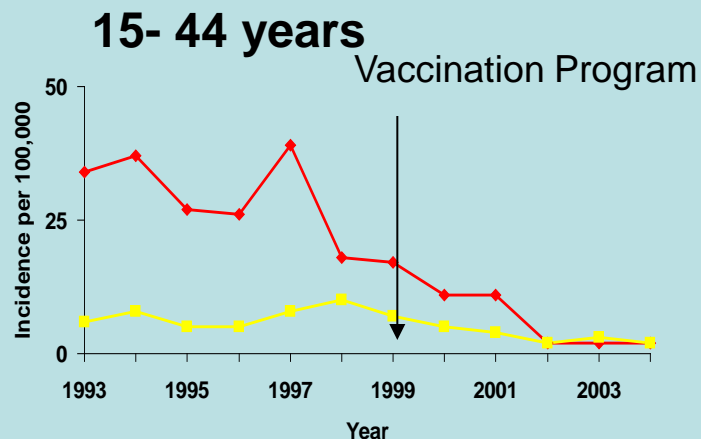
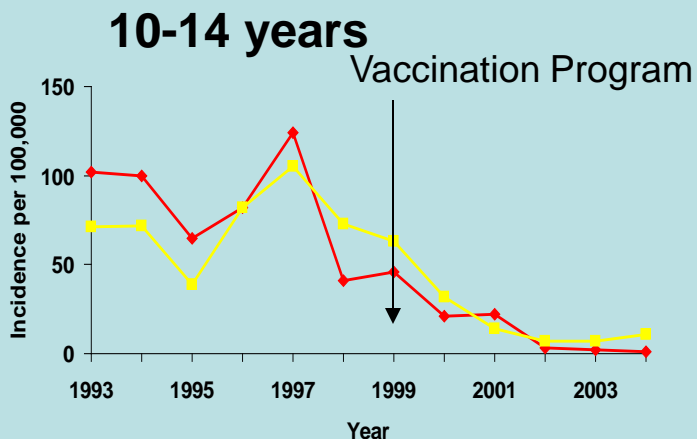
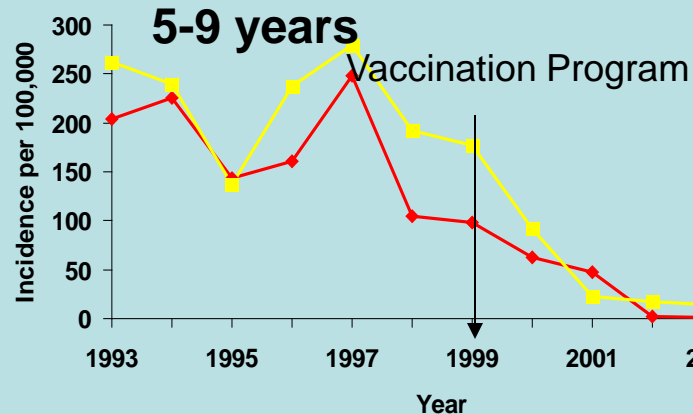
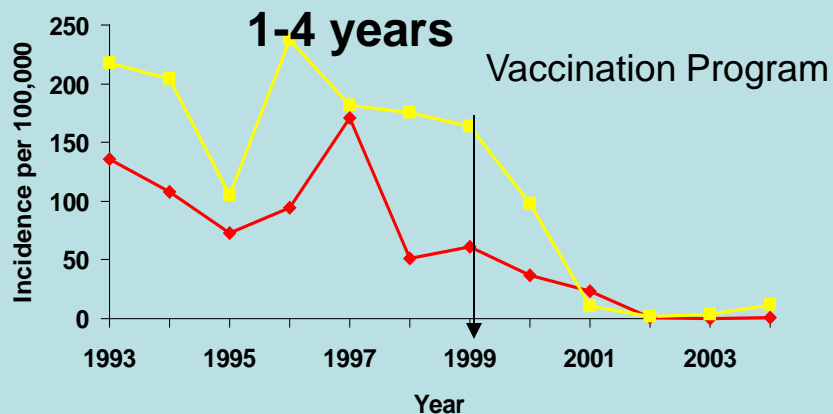
# Total Reduction in Reported HAV Disease 1993-8 vs 2002-6



**Vaccine coverage: ~ 90% receive 1 dose; > 80% receive 2 doses**



# Hepatitis A Incidence, by Age and Population Group, Israel, 1993-2004



■ Jews
 ■ Non-Jews

# Molecular Epidemiology of HAV in Jerusalem (1999-2004)

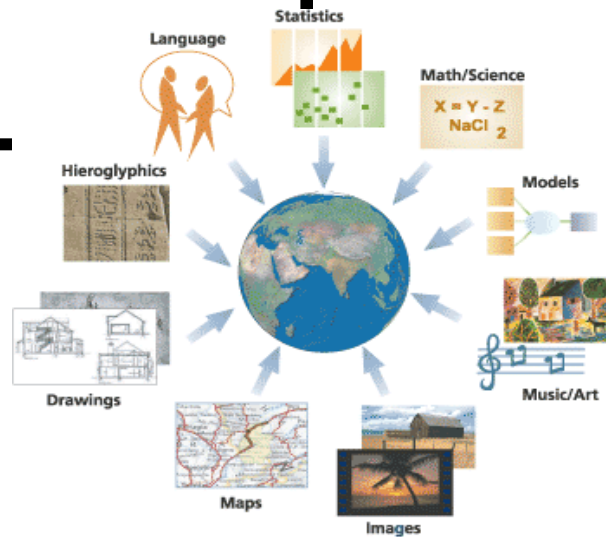
- Total population studied by HAV-RNA  
N=848
  - Number of subjects positive for HAV-RNA  
by PCR N=709 (84%)
  - 599 samples obtained from patients in  
the city of Jerusalem were subjected to  
further analysis
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# Geographic Information System (GIS)

A system of *hardware* and *software* linking *mapped objects* to *collected information* (i.e. epidemiologic data)

GIS

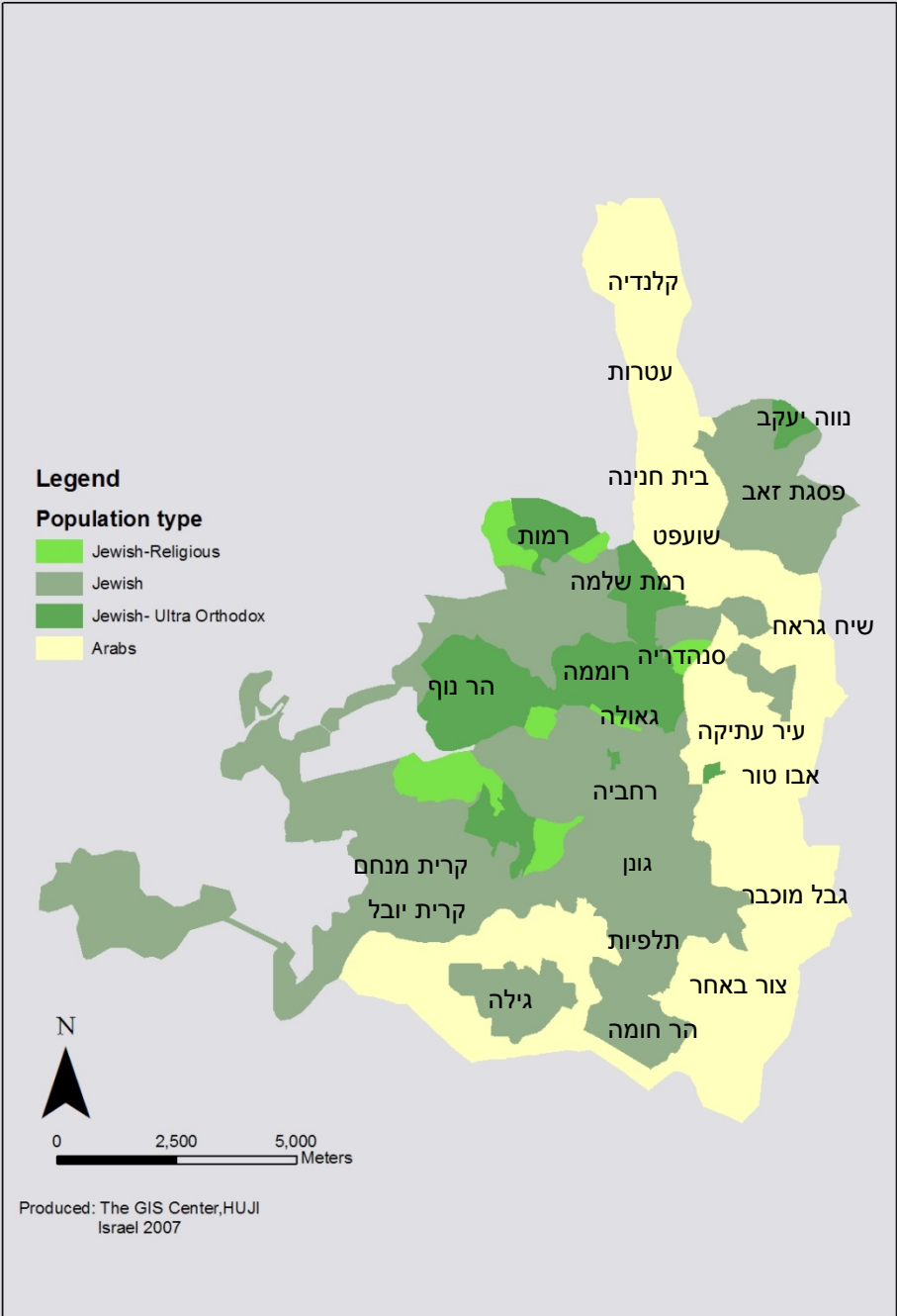
Mapping/  
Spatial  
Analysis



Demographic and  
hepatitis A  
Sequence  
analysis

# Distribution of Ethnic Populations

- Jewish-orthodox
- Jewish-religious
- Jewish-secular
- Non-Jewish-Arab

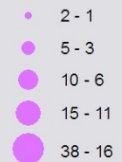


# HAV isolates in Jerusalem

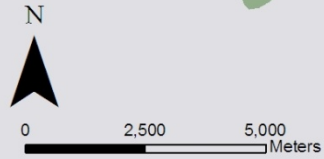
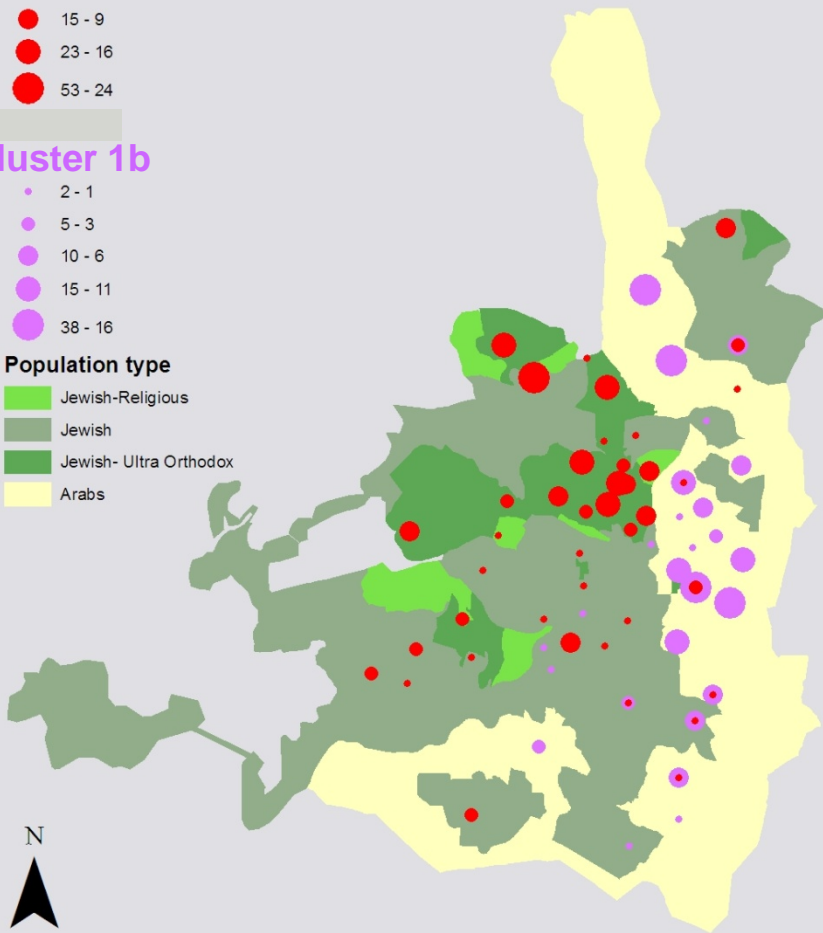
## Cluster 1a



## Cluster 1b



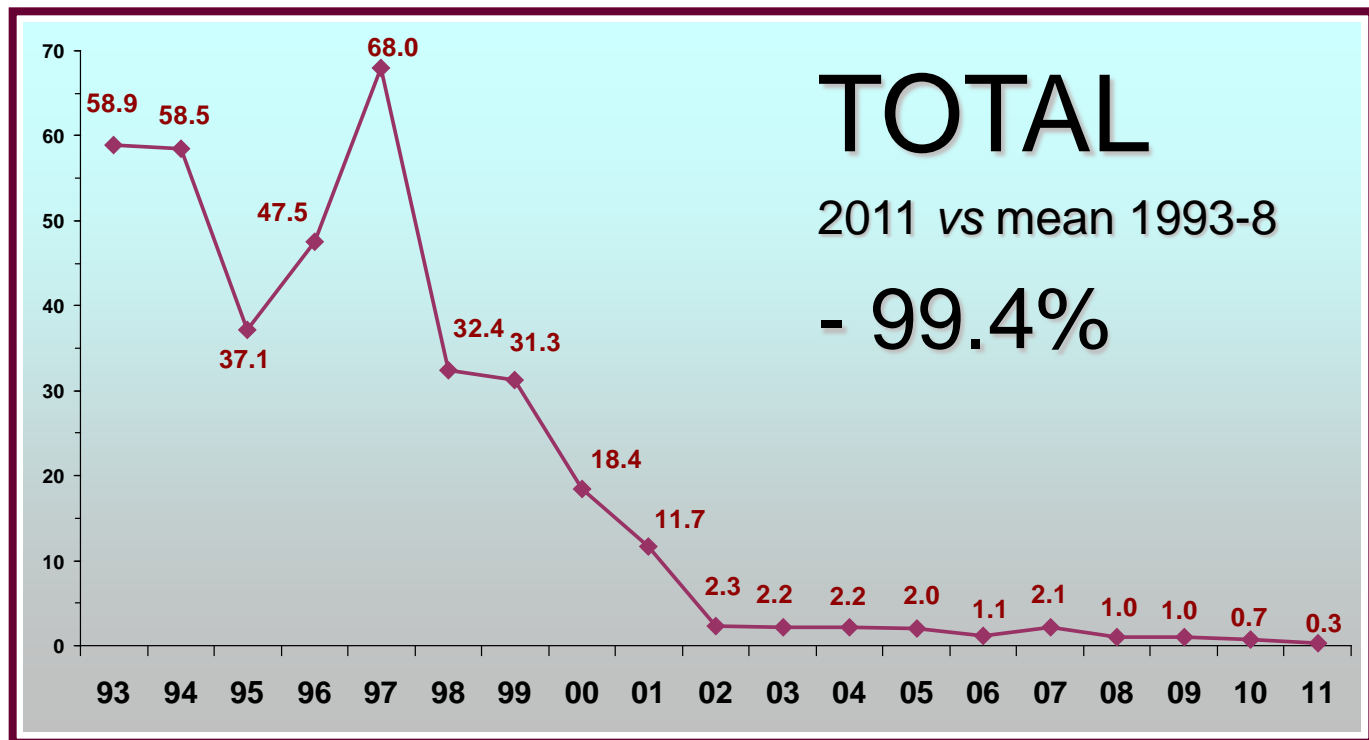
### Population type



Produced: The GIS Center, HUJI  
Israel 2007

# Follow-up: HAV Nationwide Vaccination in Israel

- Starting July 1999 all toddlers in Israel receive 2 doses of HAV vaccine at age 18 and 24m •
- The vaccine is provided free of charge, as a part of the regular immunization program •
- ~ 90% receive 1 dose; > 80% receive 2 doses •
- No Catch-up program beyond toddlers was introduced •



# Acknowledgements

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