Epidemiology of Hepatitis A in Israel
Demographics

Israel's population: 6.3 million in 2000

- Jewish population - 78%
- Non-Jewish population - 22%, of whom
  - 82% Moslems
  - 9% Christians
  - 8.8% others
Reported Acute Viral Hepatitis Through Passive Surveillance
Incidence - Israel, 1960-1998
Incidence of Viral Hepatitis A per 100,000 in Israel During 1963-1996 by Population

- **Non-Jewish population**
- **Jewish population**
Age-Specific Incidence of Reported HAV in Israel during 1993-8

Overall incidence Per 100,000
Jews non-Jews
46.8 65.1
Highlights of HAV Epidemiology in Israel

Background information:

- 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)
Etiology of Fulminant Hepatitis in Jerusalem (until 2000)
Hepatitis A Surveillance Systems in Israel

Passive surveillance:  
*National*  
Through notifications to the Ministry of Health  
(HAV committee: coordinator - Ron Dagan)

Active Surveillance:  
*Only in Jerusalem*  
(coordinator - Daniel Shouval)
Annual Incidence of Acute HAV per District

Overall incidence: 42.4/100,000
(N=5,066,200)

Passive surveillance

*1999 data, active surveillance
Hepatitis A Virus (HAV)

- Picornaviridae
- Non-enveloped single strand RNA
- 27-32 nm diameter, 7.5 kb length
- One ORF of ~ 6.7 kb
- 4 structural proteins (capsid)
- 7 non structural proteins
Detection of Hepatitis A Sequences by PCR Methods

- HAV RNA extracted from 10-100 µl serum
- Nested RT-PCR
- Purification of PCR products
- Nucleic acid sequencing by automated sequencer
- Sequence analysis - Wisconsin Genetic Computer Group
- Epidemiological databases established using Access
Molecular Epidemiology of HAV in Jerusalem

- Total population studied by HAV-RNA N=848
- Number of subjects positive for HAV-RNA by PCR N=709 (84%)
- Number of subjects analyzed by Geographic Information System (GIS) in the city of Jerusalem N=599*

*110 (16%) subjects were from the district and not the city of Jerusalem
Male/Female Ratio*

<table>
<thead>
<tr>
<th></th>
<th>Total cohort (N=1858)</th>
<th>PCR Tested (N=848)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MALE</td>
<td>FEMALE</td>
</tr>
<tr>
<td>MALE</td>
<td>959</td>
<td>899</td>
</tr>
<tr>
<td>FEMALE</td>
<td>899</td>
<td>959</td>
</tr>
<tr>
<td></td>
<td>51.6%</td>
<td>48.4%</td>
</tr>
</tbody>
</table>

*1999-2003
Total Study Population Tested for HAV RNA by PCR (N=848)

JEWISH/NON-JEWISH RATIO

<table>
<thead>
<tr>
<th></th>
<th>JEWISH</th>
<th>NON-JEWISH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>63.6%</td>
<td>36.4%</td>
</tr>
</tbody>
</table>

MALE/FEMALE RATIO

<table>
<thead>
<tr>
<th></th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>52%</td>
<td>48%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>441</th>
<th>407</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>52%</td>
<td>48%</td>
</tr>
</tbody>
</table>
**Genotype:** A group with >85% nucleotide sequence identity (6 genotypes)

**Sub-genotype:** Defined as nucleotide identity within the sub-group is no less then 92.5%
Distribution of HAV Genotypes and Sub-genotypes
HAV Genotype Distribution in Sub-populations - Jerusalem

Jewish population (N=466)
- 1a (81%)
- 1b (19%)

Non-Jewish population (N=243)
- 1a (4%)
- 1b (96%)
Incidence of acute HAV in Israel, 1998 – 2012, rate/100,000, by population group

The graph shows the incidence of acute HAV in Israel from 1998 to 2012, with rates per 100,000 population. The data is segregated by population group: Non-Jews and Jews. Over the years, there is a noticeable decrease in the incidence rate for both groups, with a sharper decline for Non-Jews compared to Jews.

Key observations:
- The highest incidence rates are observed in 1998 for both groups.
- By 2012, the incidence rates have significantly decreased across both groups, with Non-Jews showing a more pronounced drop.

This graph highlights the effectiveness of public health interventions in reducing HAV incidence in Israel.