Country and Regional Examples of Hepatitis A Prevention - Israel

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Pre-Vaccination Data

• Until 1999, Israel was considered a country with intermediate HAV endemicity

• Average annual incidence rate during the period from 1993-1998 was 50.4/100,000
Differences between Jewish and Non-Jewish Populations in Israel

- In theory, difference in socio-economic, sanitation and crowding conditions, even within the same country, could result in differences in HAV disease dynamics, leading to disparity between populations.

- Israel's population: 6.29 million 2000:  
  - Jewish population - 78%
  - Non-Jewish population - 22%
    - 82% Moslems
    - 9% Christians
    - 8.8% others

- In general, the non-Jewish population lives under lower socioeconomic conditions than the Jewish population:
  - more crowded living conditions
  - a greater proportion of children < 15 years
  - a more rapid population growth
Incidence of Viral Hepatitis in Israel 1963-1996 by Population

Incidence per 100,000

Year

Non-Jewish population
Jewish population

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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

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Dagan et al. *JAMA* 294:202-10, 2005
HAV Incidence in Israel from 1985

- Total "infectious hepatitis"
- Hepatitis A

Annual incidence per 100,000 population

Jews: 46.8
Non-Jews: 65.1

Year

Dagan et al. JAMA 294:202-10, 2005
+ additional data from Israel MoH
HAV Incidence in Israel from 1985

Annual incidence per 100,000 population

Year

Total population

Jews

Non-Jews

Total "infectious hepatitis"

Hepatitis A

95.4%

96.8%

92.8%

50.4

46.8

65.1

2.3

1.5

1.1

1.0

1.3

Dagan et al. JAMA 294:202-10, 2005
+ additional data from Israel MoH

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Reporting of HAV Cases in Israel: 1993 Through 2006 by Age-Group and Ethnic Population

Dagan et al. *JAMA* 294:202-10, 2005
Reporting of HAV Cases in Israel: 1993 Through 2006 by Age-Group and Ethnic Population

- Incidence/100,000 inhabitants

- Year 1993 to 2006

- <1 year

- ≥ 45 years

Dagan et al. JAMA 294:202-10, 2005
Summary of Age-Specific Reduction in Reported HAV Disease 1993-8 vs 2002-4

Dagan et al. JAMA 294:202-10, 2005
Summary of Age-Specific Reduction in Reported HAV Disease 1993-8 vs 2002-4

- **5 - 9 yrs**: 97%
- **1 - 4 yrs**: 98%
- **10 - 14 yrs**: 96%
- **15 - 44 yrs**: 90%
- **< 1 yr**: 90%
- **45 - 64 yrs**: 91%
- **≥ 65 yrs**: 70%

**Incidence/100,000 inhabitants**

**TOTAL** - 95.4%

Dagan et al. JAMA 294:202-10, 2005
Seropositivity Rate in Non-immunized Bedouin Toddlers Aged 16-20 m from the Town of Rahat 1991-2007

% seropositive for hepatitis A virus

11-100 mIU/ml  101-999 mIU/ml  >= 1,000 mIU/ml

Born before introduction of the universal immunization program

Year of specimen collection

1991-4  n = 37
16.2
2.7

1995-8  n = 50
18
1.6

2000  n = 122
18
1.6
Seropositivity Rate in Non-immunized Bedouin Toddlers Aged 16-20 m from the Town of Rahat 1991-2007

Year of specimen collection

% seropositive for hepatitis A virus

Born before introduction of the universal immunization program

Born after introduction of the universal immunization program

n = 37 n = 50 n = 122 n = 126 n = 125 n = 201
Summary of Total Reduction in Reported HAV Disease 1993-8 vs 2002-6

TOTAL
2006 vs mean 1993-8
- 97.8%
HAV Cases Occurring in 2002-6

- Of the 681 cases reported nationwide, the vaccination status could be ascertained in 544 (95%)

- Of these
  - 529 (97.6%) received no vaccine
  - 14 (2.4%) received 1 dose
    - 6 young adults (4 soldiers) who received 1 dose in the past
    - 3 children aged < 10 received only 1 dose
    - 5 became sick only a few days after vaccination
      - 3 soldiers who received 1 dose a few days before symptoms and were part of a small food-borne outbreak (total of 7 cases, 4 of who were not vaccinated)
      - 1 child
      - 1 adult
  - 0 received 2 doses
HAV vaccine and outbreaks in school and day-care centers
HAV outbreaks in DCC and School Settings - Israel
Southern Region 1993-2005

Number of clinical cases

Number of outbreaks

Number of Children receiving post-exposure immunoglobulin prophylaxis

Year

HAV outbreaks in DCC and School Settings - Israel Southern Region 1993-2005

HAV outbreaks in DCC and School Settings - Israel Southern Region 1993-2005

HAV outbreaks in DCC and School Settings - Israel Southern Region 1993-2005

Number of clinical cases

Number of outbreaks

Number of Children receiving post-exposure immunoglobulin prophylaxis

An opportunity for the elimination of population disparity in disease incidence
Reduction Of Hepatitis A Disease

Mean incidence per 100,000

Age 1-4 y

Overall

Jews
Non-Jews

Mean 1993-1998
Mean 2002-2004

Jews
Non-Jews

Mean incidence per 100,000

Dagan et al, 45th ICAAC, Washington, Abst #G-409, Dec 2005
Incidence of HAV Reported Cases* among Jews and Bedouins in Southern Israel

* Until 1993 all cases of "infectious hepatitis" were grouped. Reporting by virus type (hepatitis A, B or C) started in 1993
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Conclusions

- Israel was the first country to introduce hepatitis A vaccination to the Universal vaccination plan
- The Israeli universal toddler-only immunization program resulted in a dramatic reduction of HAV circulation and disease in all ages, demonstrating not only the high efficacy of the vaccine, but also a marked herd protection
- HAV vaccines can reduce disparities between populations
- Universal HAV vaccination may result in elimination of DCC and school-setting outbreaks, without the need of mandating pre-school vaccination
- The experience gained in Israel raises 2 important issues:
  - The need to plan for catch-up programs is questioned, if the toddlers-only approach is adopted
  - Cost-benefit studies must take in account that vaccination programs aimed at only a small fraction of the population (in the present case < 3%) can reduce profoundly disease in the entire population