



# Epidemiology and Prevention of Hepatitis A in Korea

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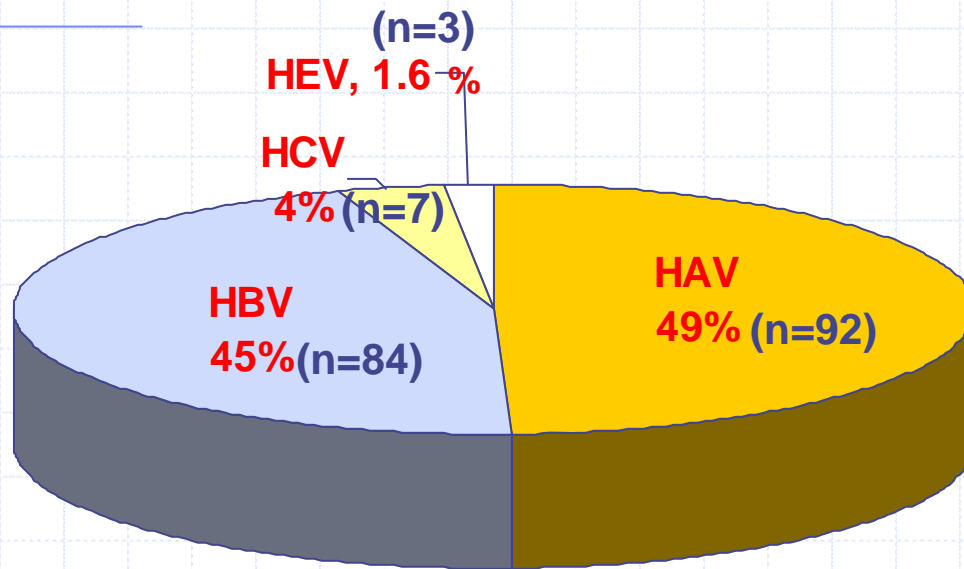
- **Etiology of Acute Viral Hepatitis**
- **Change of Hepatitis A Epidemiology**
  - Seroprevalence of anti-HAV
  - Age distribution of acute hepatitis A patients
- **Status of current hepatitis A vaccine**

# About South Korea



**Population: about 48 million, Capital: Seoul**  
**Gross domestic products(GDP): \$ 791 billion (12<sup>th</sup>)**  
**Gross national income(GNI): \$ 765 billion (11<sup>st</sup>)**  
**Personal GNI: \$ 18,372 (41-49<sup>th</sup>)**

# Etiology of Acute Viral Hepatitis



- HBsAg+ rate  
1970s: 7-8%  
2005: 3.5%  
school age: <1%
- Anti-HCV rate: <1%

- Asan Medical Center, University of Ulsan, Seoul
- Study periods: 2002-2004
- Fulminant hepatitis: 10 cases (all: hepatitis B)

Song MH. et al. Korean J Med 2005;68:256-60

# Change of Hepatitis A Epidemiology

- Due to the absence of reporting system in the past, it was impossible to determine the exact disease burden of hepatitis A.
- In the 70s, the prevalence of hepatitis A was so high that, hepatitis A accounted for approximately 2-5% of all hospitalized children in South Korea. This situation remained the same until the mid-80s.
- Thereafter, the cases had significantly decreased until an outbreak had occurred in a city in 1996. Since then, the number of hepatitis A cases gradually increased and in 2006, 1,923 cases were officially reported.

# Proportion of In-patient with Hepatitis A in 1970s

St. Mary's Hospital, The Catholic University of Korea

Year	No of HepA	Total No of In-Pt	%	Year	No of HepA	Total No of In-Pt	%
1968	31	931	3.3	1973	26	1,010	2.6
1969	15	1,084	1.4	1974	24	844	2.9
1970	16	937	1.7	1975	35	895	3.9
1971	18	922	2.0	1976	20	847	2.4
1972	29	963	3.0	1977	27	1,036	2.6
<b>Total</b>					<b>241</b>	<b>9,469</b>	<b>2.5</b>

\* HepA, hepatitis A; Pt, patient

Lee et al. J Kor Pediatr Soc 1979;22:47-55

**Other reports from 1970s: 1.3 - 6.4%**

Choi et al. J Kor Pediatr Soc 1972;15:753

Park et al. J Kor Pediatr Soc 1975;19:180

Shim et al. J Kor Pediatr Soc 1978;21:215

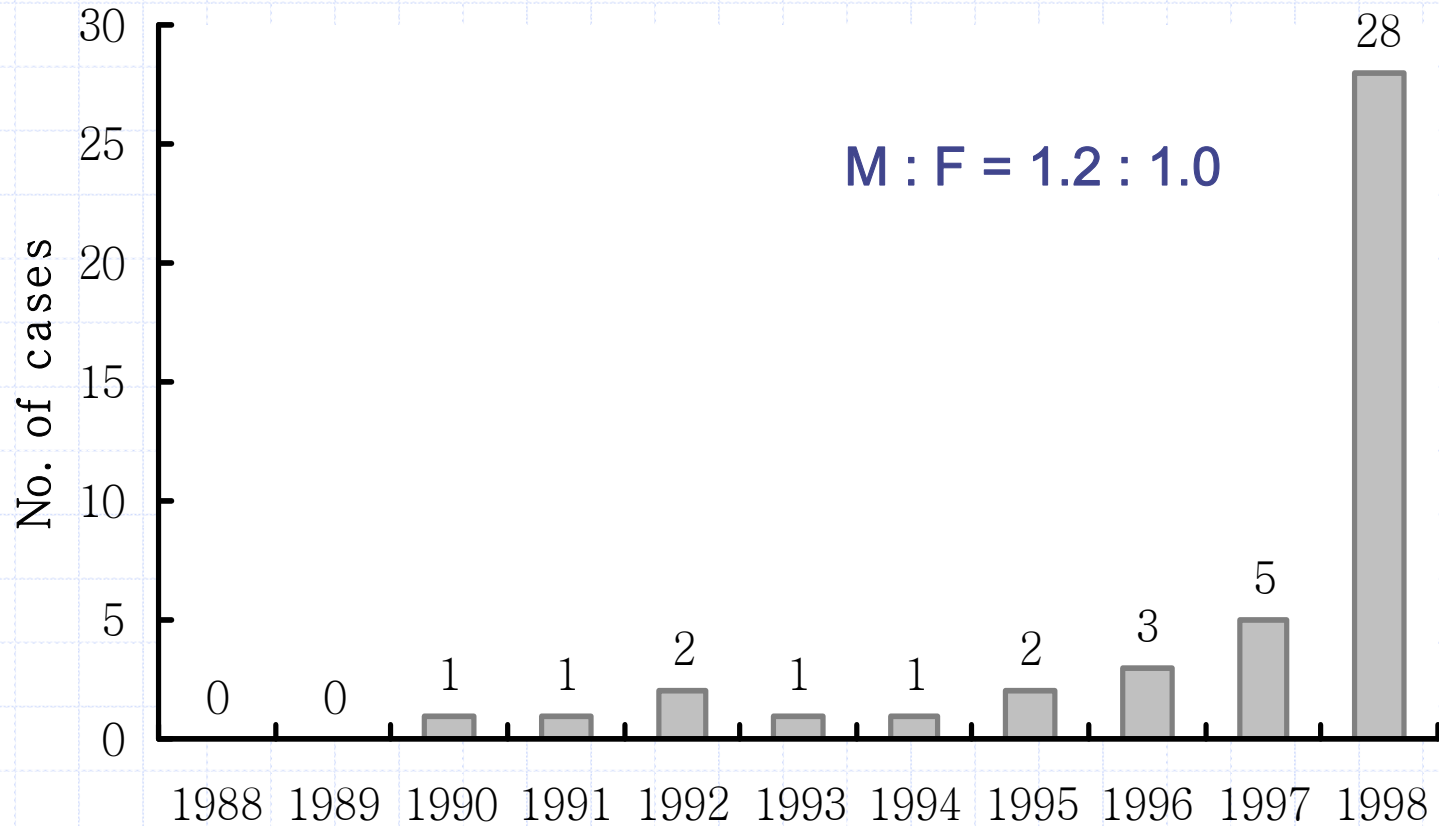
Lee et al. J Kor Pediatr Soc 1978;21:376

# First Outbreak of Hep A at Daejeon City in 1990s

- **Periods: July to Dec, 1996**
- **Institution: St. Mary's Hospital, The Catholic University of Korea**
- **Total number of patients: 60 cases (31 children, 30 adults)**
- **Age distributions: age 4 – 26 years**
  - **Children: 3 cases in 4-5 year of age, 13 cases in 6-10 year of age, 15 cases in 11-15 year of age**
  - **adults: 29 cases in 16-26 year of age**

# Prevalence of Hepatitis A on 1988-98

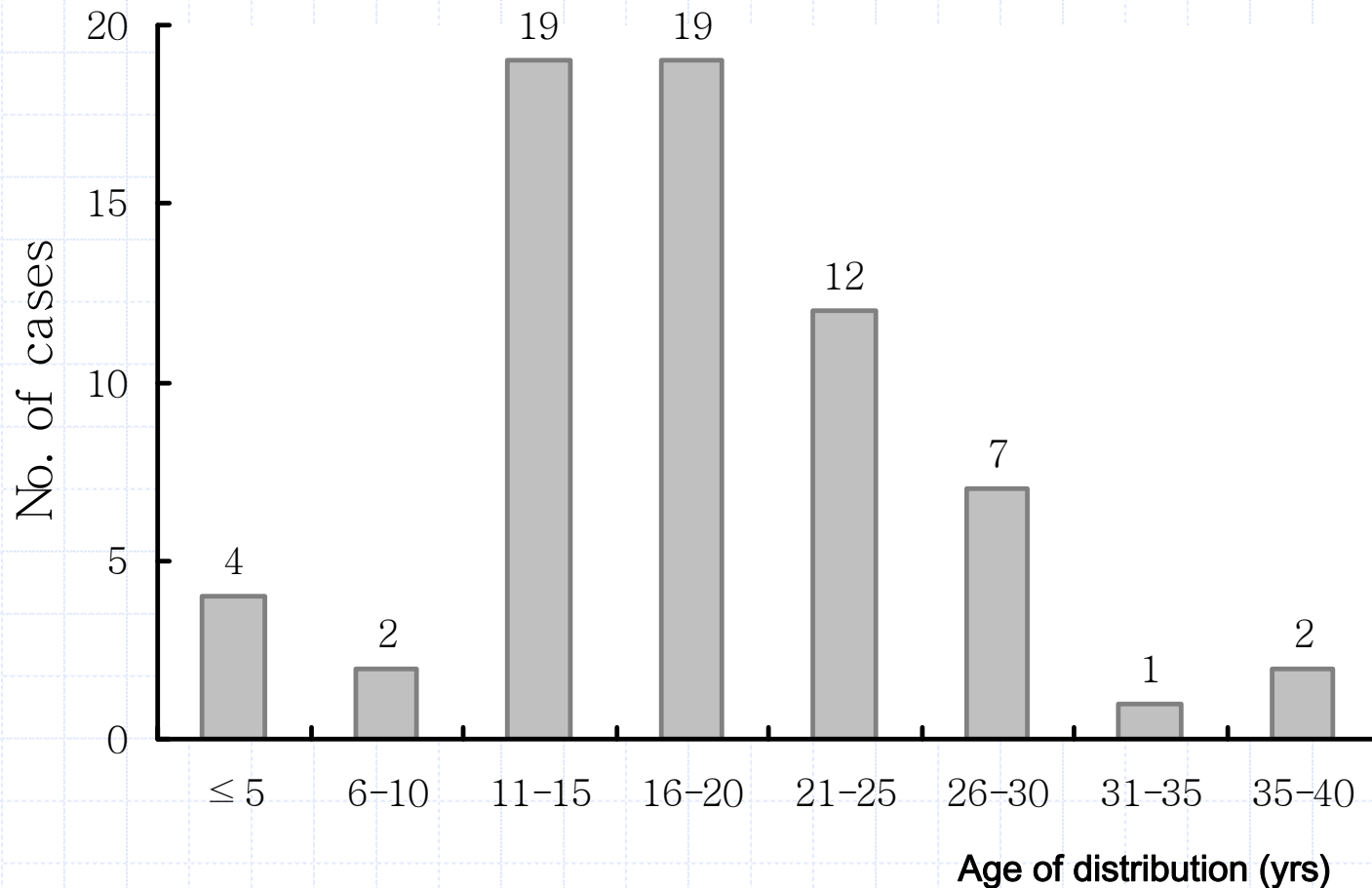
Four hospitals attached to The Catholic University of Korea





# Age Distribution of Hepatitis A on 1988-98

Four hospitals attached to The Catholic University of Korea



# Reported Cases of Hepatitis A in National Sentinel Surveillance System (Korea CDC)

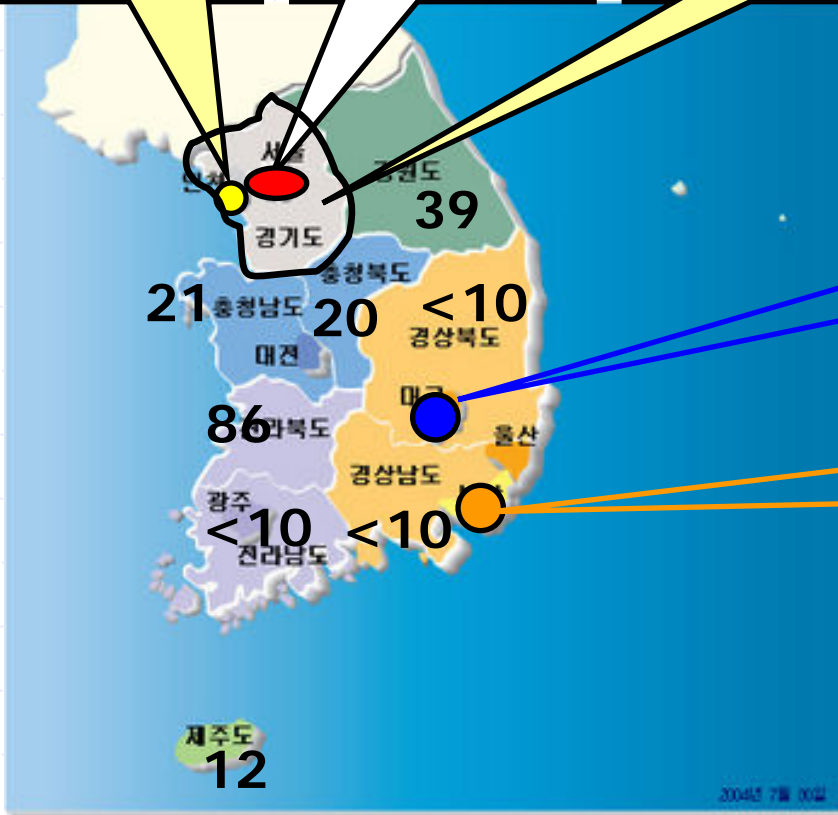
Age (yr)	2006	2005	2004	2003	2002	2001
0-4	4	8	2	3	2	1
5-9	20	13	8	2	6	3
10-14	63	33	15	12	12	5
15-19	105	58	28	35	47	6
<b>20-29</b>	<b>914</b>	<b>370</b>	<b>182</b>	<b>166</b>	<b>147</b>	<b>48</b>
<b>30-39</b>	<b>659</b>	<b>241</b>	<b>100</b>	<b>80</b>	<b>77</b>	<b>24</b>
40-49	116	60	15	8	21	10
50-59	16	5	4	3	1	3
> 60	26	8	5	3	4	5
<b>Total</b>	<b>1923</b>	<b>796</b>	<b>359</b>	<b>312</b>	<b>317</b>	<b>105</b>

# Hepatitis A Cases on 2006

**Incheon**  
121 cases

**Seoul**  
793 cases

**Kyonggi**  
768 cases



2006'  
Total cases: 1,923

Seoul to Pusan (400km)  
by car: 5 hrs  
by high speed train  
: 3 hrs

**Daegu**  
10 cases

**Pusan**  
< 10 cases

1<sup>st</sup> city: Seoul  
2<sup>nd</sup> city: Pusan  
3<sup>rd</sup> city: Daegu

**Why so different?**

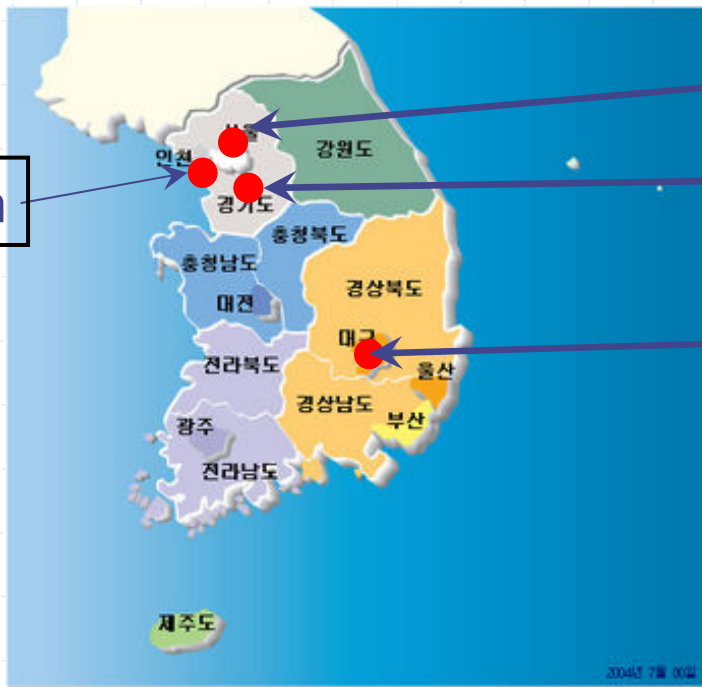
# Outbreak of Hepatitis A in Kongju City (June, 2004)

- **Confirmed acute hepatitis A patients = 54 cases**  
**< 9 yrs, 2; 10-19 yrs, 12; 20-29 yrs, 31; 30-39 yrs, 6; > 40yrs, 3**
- **Epidemiological survey was performed.**
- **Thirty-nine out of 54 patients: visiting history of a restaurant with family or friends from late April to mid-May.**
- **That restaurant used the underground water kept in water-tank to clean tableware.**



# Most recent sero-prevalance Study I

- Study period: 2006'
- Enrolled institutes: 5 university hospital
- Regions: Seoul (2), Incheon (1), Suwon (1), Daegu (1)



Seoul

Suwon

Daegu

Seoul, Suwon, Incheon regions are relatively endemic area in Korea

# Most recent sero-prevalence Study II

- **Sample Sizes: total 1,000** (equally divided by each institute)

1-4 year: 100 cases (every age interval)

5-9 year: 125 cases (every age interval)

10s: 250 cases (every age interval)

20s, 30s: 150 cases each (2 year interval)

40s: 100 cases (2 year interval)

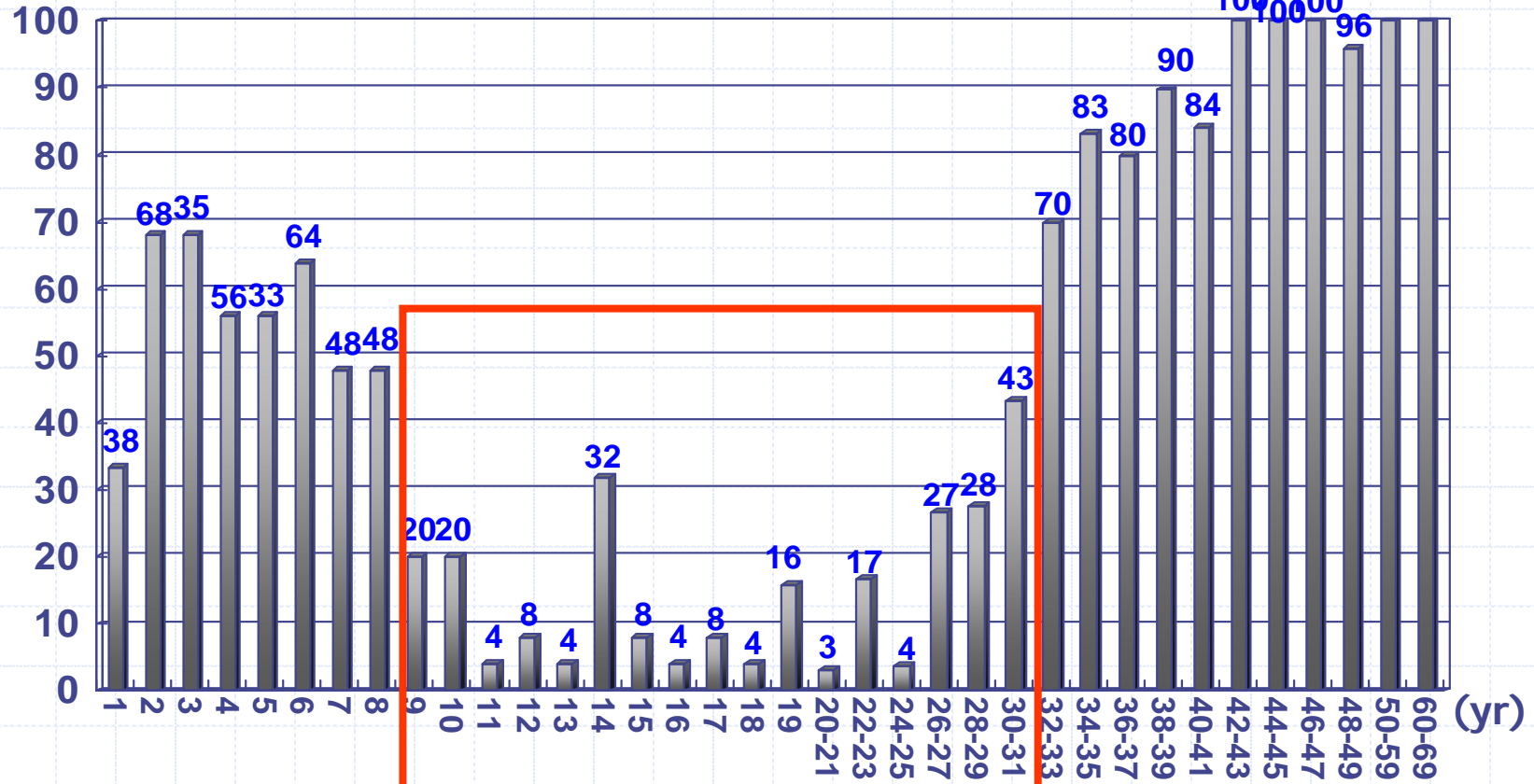
50s', > 60s': 50 cases each

- **Test: Elecsys Anti-HAV reagent kit (Roche)**  
Electrochemiluminescence Immunoassay (ECLIA)  
Positive: Immunity by past infection or vaccination

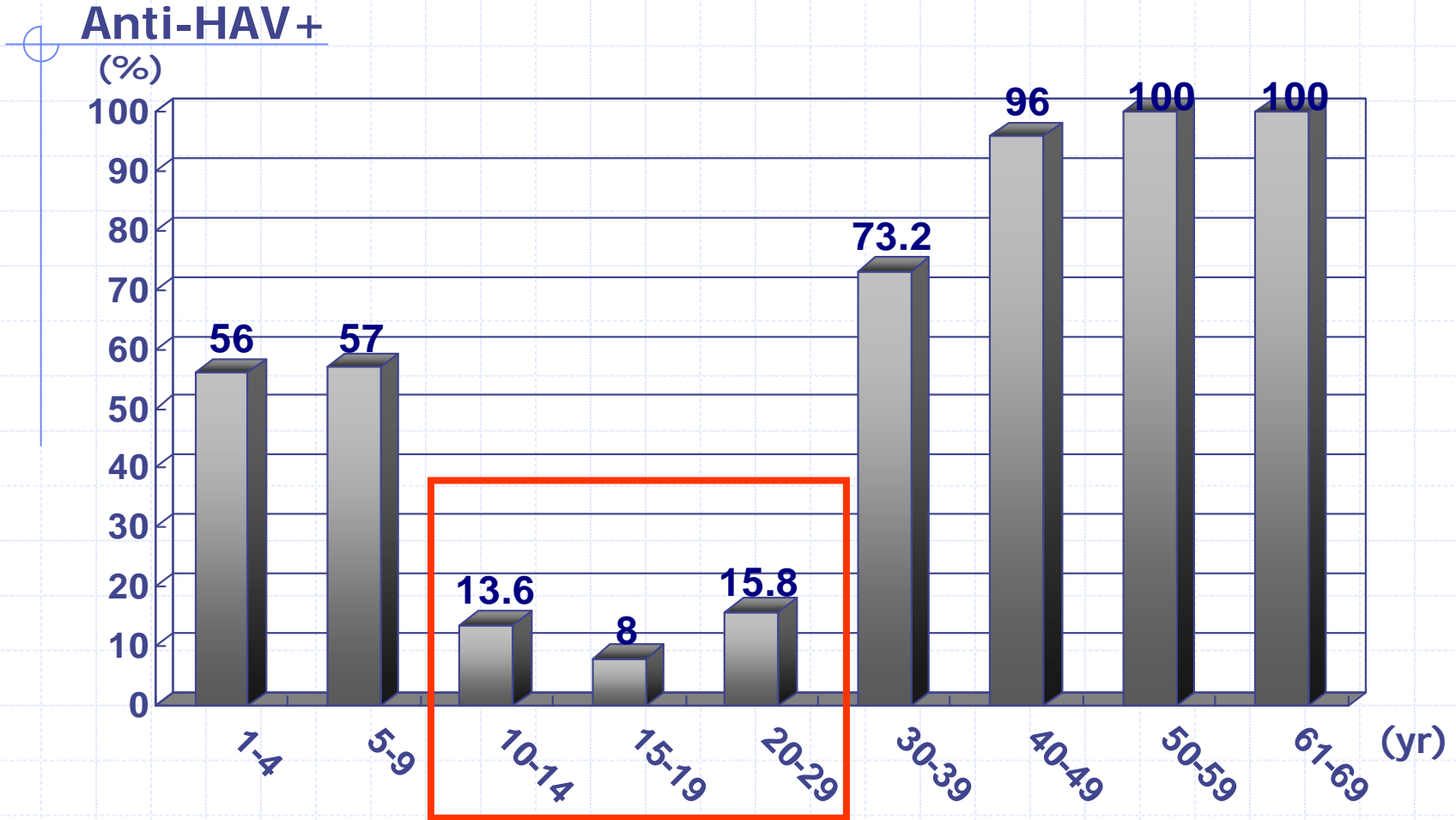
# Result: Age-specific Sero-prevalence of Hepatitis A Antibody in Korea

Anti-HAV+

(%)



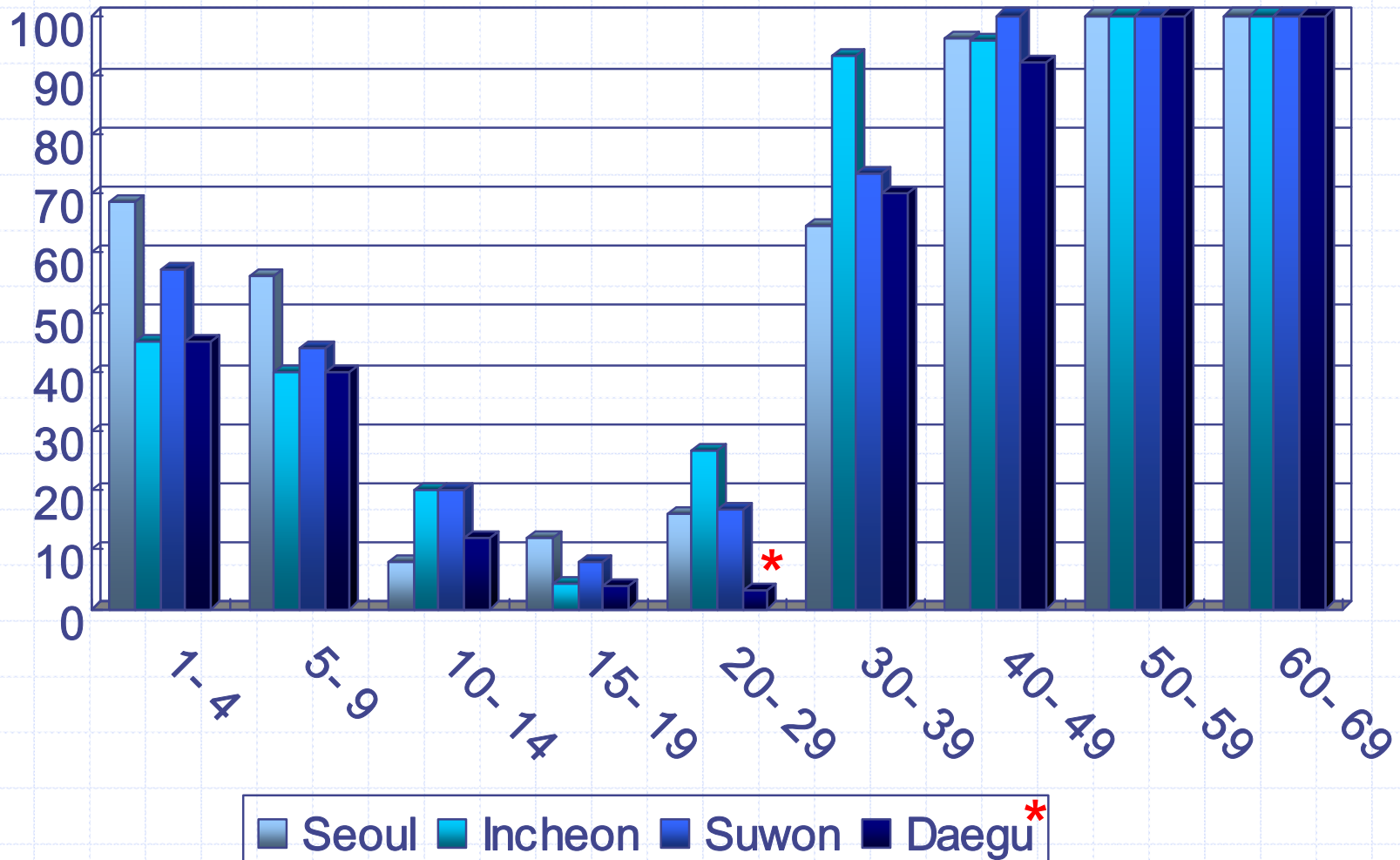
# Result: Sero-prevalence of Hepatitis A Antibody by Age Groups



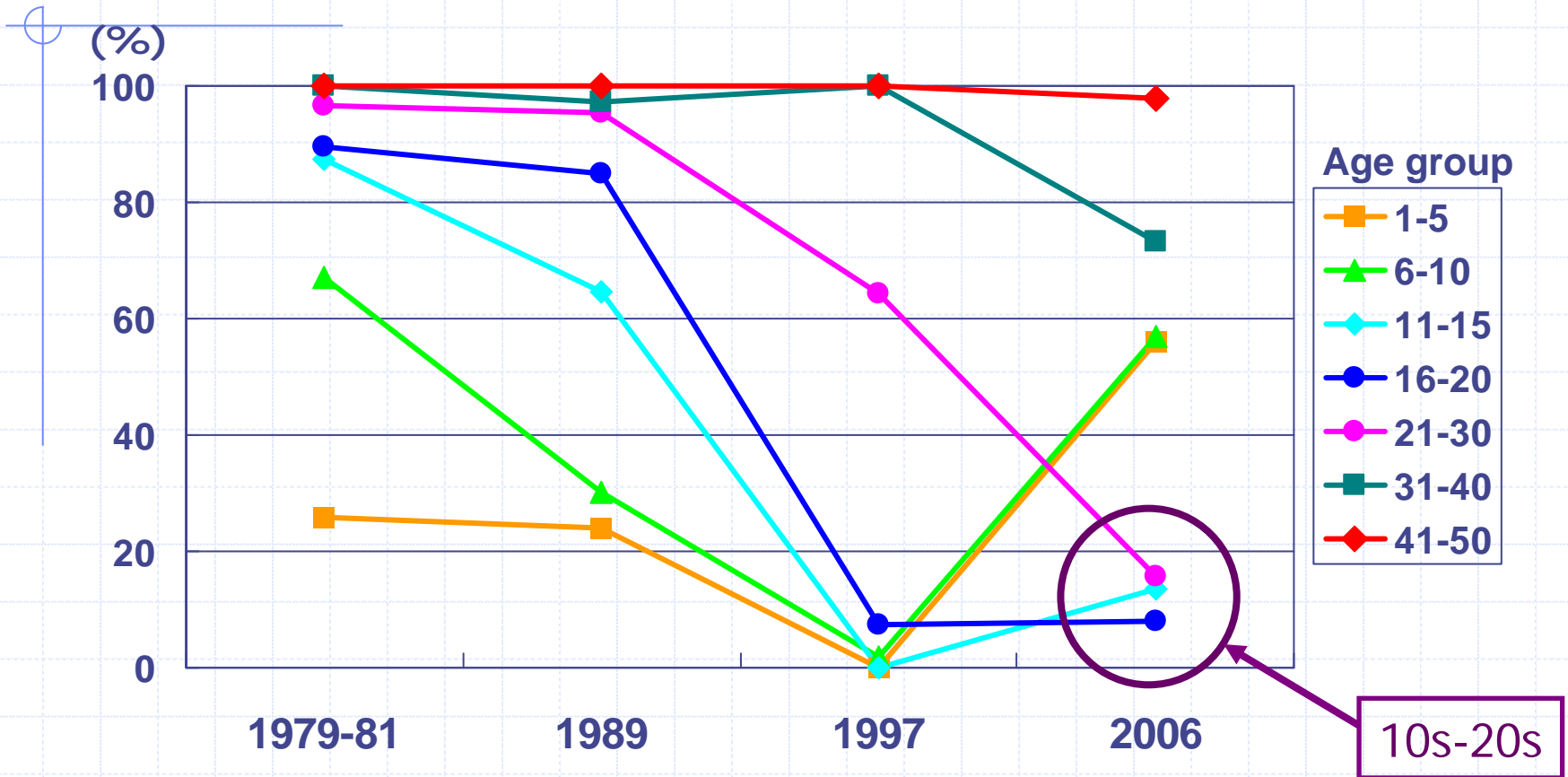


# Result: Sero-prevalence of Hepatitis A Antibody by Regions

Seoul, Suwon, Incheon regions are relatively endemic area in Korea



# Changes of anti-HAV IgG in Korea



Korean J Int Med 1982;25:19-26

Korean J Int Med 1992;43:57-63

J Kor Pediatr Soc 1997' Symposium Abs Book p96

# Hepatitis A Vaccine in South Korea

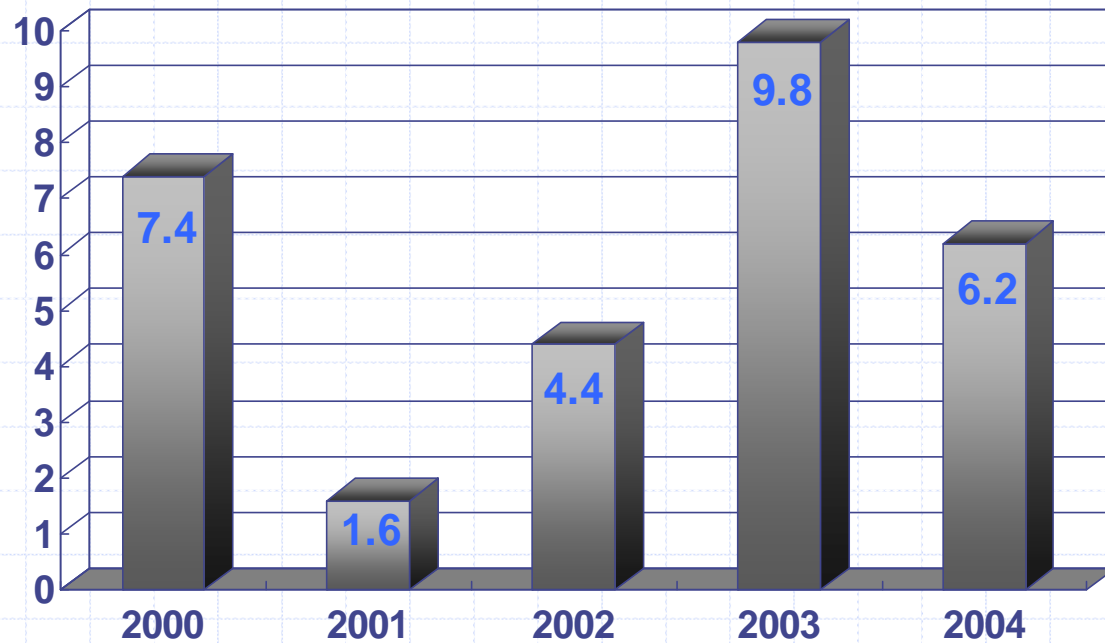
- **First launch of a hepatitis A vaccine in the late 1997**
- **Now, KFDA has licenced four different HepA vaccines**
  - **Havrix (GSK)**
  - **Vaqta (MSD)**
  - **Epaxal (Berna Biotech)**
  - **Avaxim (Sanofi-Pastuer)**
- **Recommend vaccination at above 12 months of age with interval over 6 months (not universal)**

# Incidence of Hepatitis A among Korean Soldiers

Total No. of Korean Soldiers  $\approx$  500,000

Range of Ages: 19 - 27

/ 100,000 persons

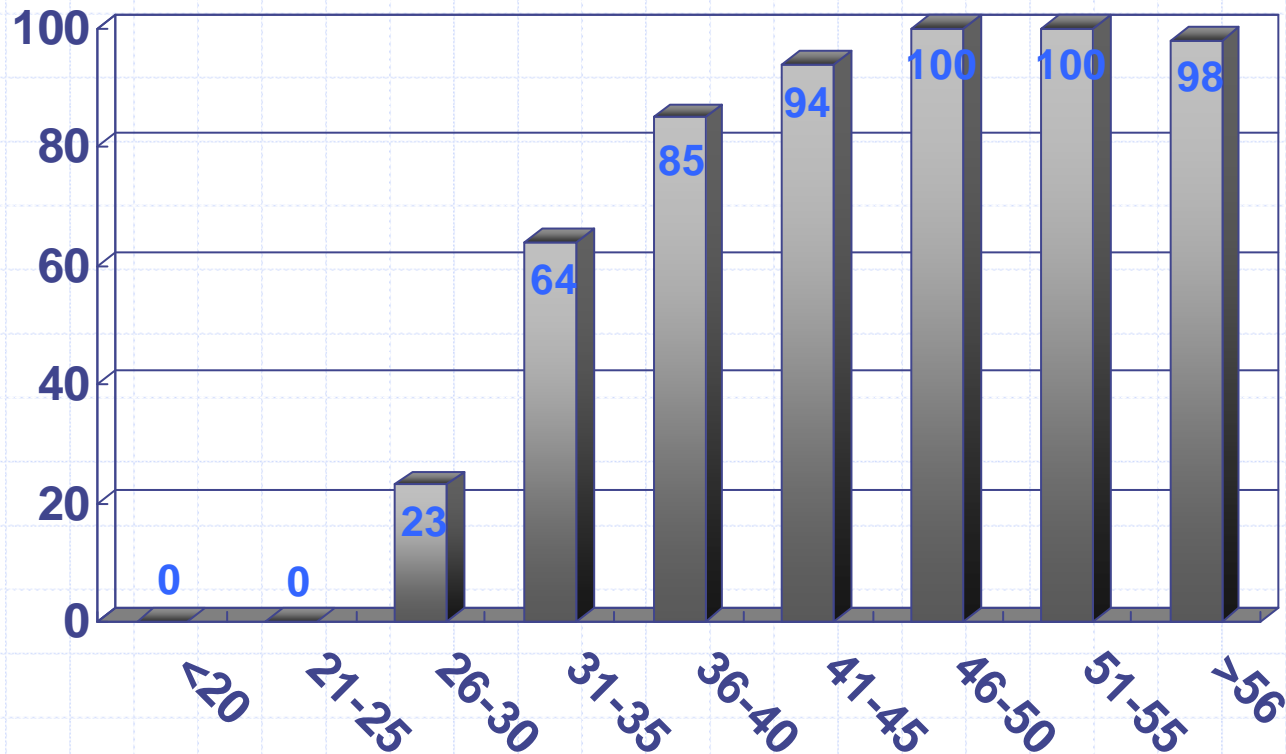


No. of reported cases	37	8	22	49	31
No. of Outbreak	2	1	1	5	2
No. of epidemic cases	23	3	3	31	4

# Age-specific Seroprevalence of Anti-HAV Antibody in Korean Patients with Chronic Liver Diseases (2005)

Age distribution: >40, 79%; 31-39, 15%

Cause of CLD: HBV 65%, alcohol 17.7%, HCV 12.9%

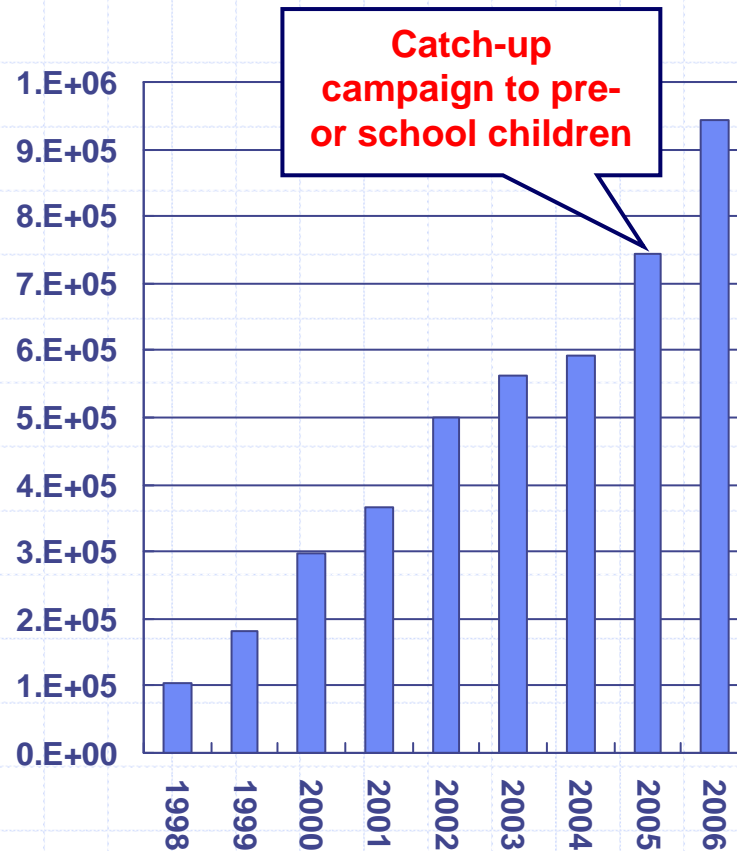


Ewha University Hospital

Song HJ, et al. J Korean Med Sci 2007;22:218

# Coverage Rate of Hepatitis A Vaccines

	Birth No	Doses
1997	675,227	
1998	640,126	103,455
1999	616,322	182,463
2000	636,780	296,508
2001	557,228	365,602
2002	494,625	498,882
2003	493,471	562,186
2004	476,052	591,505
2005	438,062	744,995
2006		942,061



- sum of total doses 4,184,202 / sum of total birth No. 5,027,893 during 1998-2006 = 41.6% (estimation)
- Actual coverage rate of Hepatitis A vaccine in 1-2 year old on 2006: 40% (Kim KH et al. unpublished data)

# Summary

- **For those aged less than 10 years old, anti-HAV prevalence was above 50%, mainly contributed to the result of vaccination.**
- **However, the prevalence of antibody in the 10s and 20s were 10-30%, a number significantly lower than other age groups.**
- **Almost all people above 40 years old have antibody to HAV.**

# DISCUSSION

- **According to Regions, there is a difference of prevalence of acute hepatitis A in small country. → why?**
- **10s having lowest anti-HAV among 10s, 20s and 30s → lowest reported cases?**