

Economic aspects of viral hepatitis in Turkey

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Vaccines currently recommended for children in National Immunization Programme in Turkey

- BCG
- DTaP: diphtheria, tetanus, and acellular pertussis
- Poliovirus
- Hib: *Haemophilus influenzae type B*
- Hepatitis B
- MMR: measles, mumps and rubella
- PNC7: pneumococcal conjugate vaccine

Optional Vaccines currently recommended for children in Turkey

- Hepatitis A
- Varicella
- Seasonal influenza
- Rotavirus

- Traditional vaccines are recommended for all common diseases with high morbidity and mortality (smallpox, measles, and polio).

- More recently, vaccines have been developed for prevalent diseases.

- But have low mortality (varicella and rotavirus) or are rare but highly lethal (meningococcal disease).

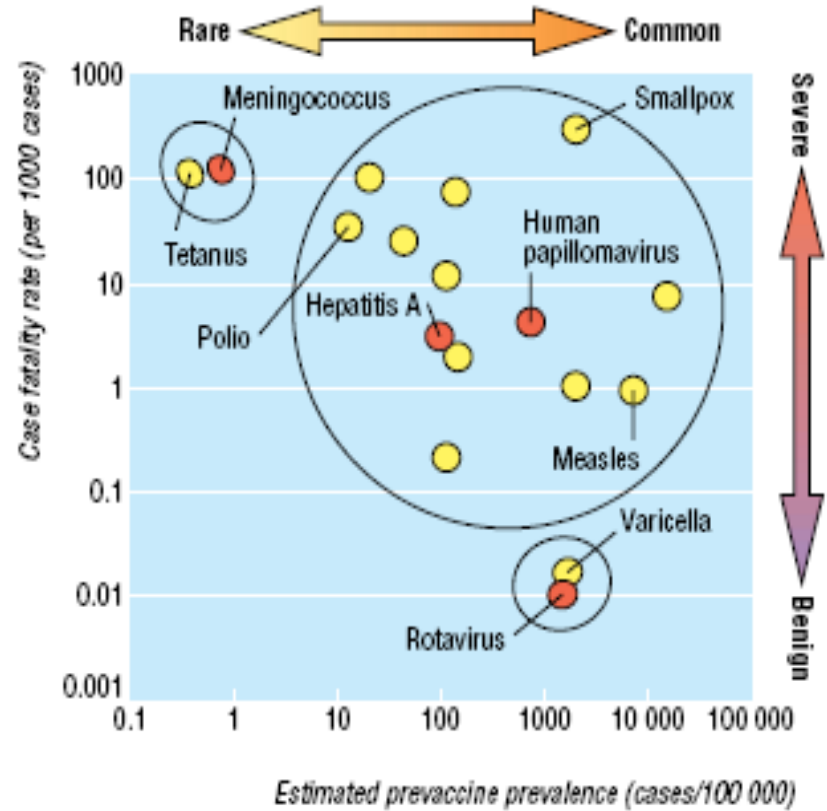
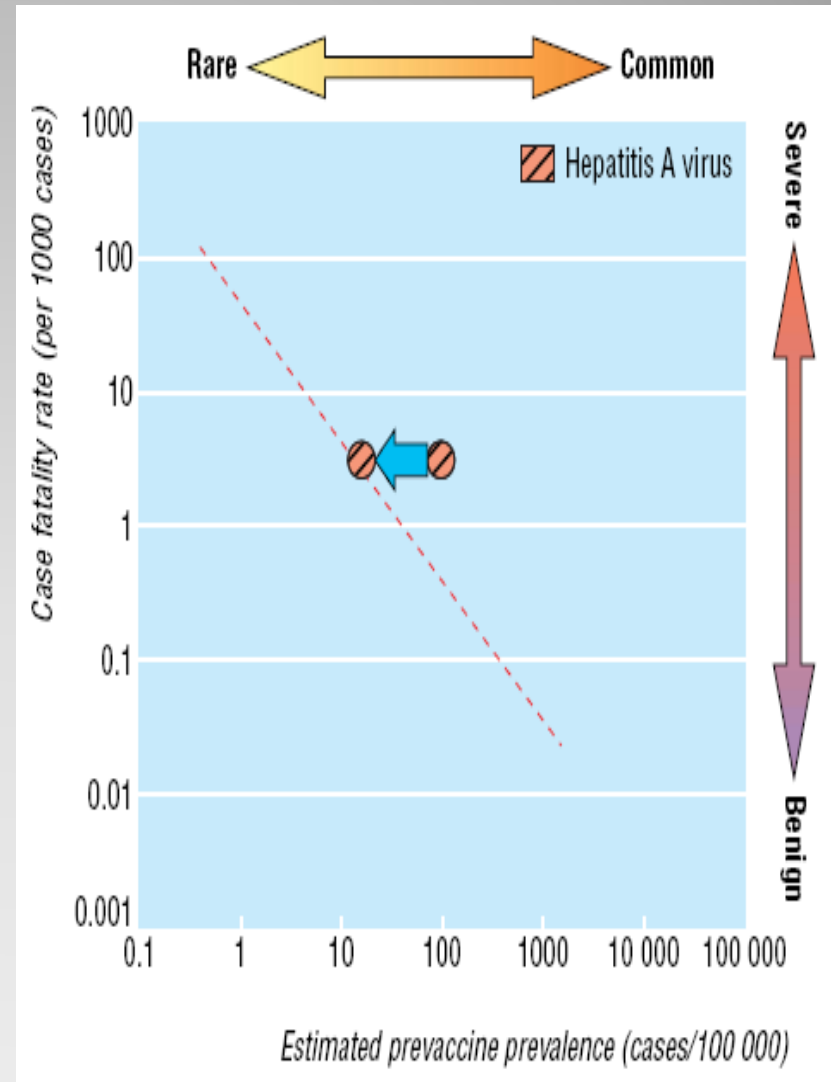


Fig 2 Mortality and prevaccine prevalence of vaccine preventable diseases in the United States. Recently recommended and future candidate vaccines shown in red ^{11 22-25}

- Policy makers should carefully consider vaccine policy.
- The recommendation on hepatitis A significantly affected prevalence and altered the characteristics of the disease.
- A line drawn between tetanus and varicella forms a traditional boundary.
- Vaccines for diseases must be justified in terms of **cost**, additional complexity, and efficacy.
- The vaccine for hepatitis A has been displaced to a position close to but still above this line.



The reduced incidence of hepatitis A due to vaccination has some unintended consequences. It can cause that the average age at infection can be shifted to further age group.

The average age at infection has increased, resulting in more clinically severe infections

- Most infected persons recover completely and a significant proportion remain asymptomatic.
- HAV infection causes considerable morbidity and mortality and imposes a large economic burden throughout the world.

Ref: [WHO/CDS/CSR/EDC/2000.7](#)

- On average, adults miss 30 days of work.
- Young children tend to suffer only flu-like symptoms, but infection of children can initiate and perpetuate community-wide outbreaks.
- Both medical treatment and work loss account in the United States for an estimated annual US\$ 500 million (1997) costs for 63 500 cases of acute hepatitis A.
- For each hospitalized case, medical care costs sum up to about US\$ 6900.

- Worldwide, an estimated 1.4 million cases of acute hepatitis A annually cost US\$ 1.5-3 billion US\$ (*)
- An HAV antibody screening test and its subsequent evaluation are estimated to cost US\$ 43 per case

(*) André FE. Approaches to a vaccine against hepatitis A: development and manufacture of an inactivated vaccine. *Journal of Infectious Diseases*, 1995, 171(Suppl 1):S33-S39.

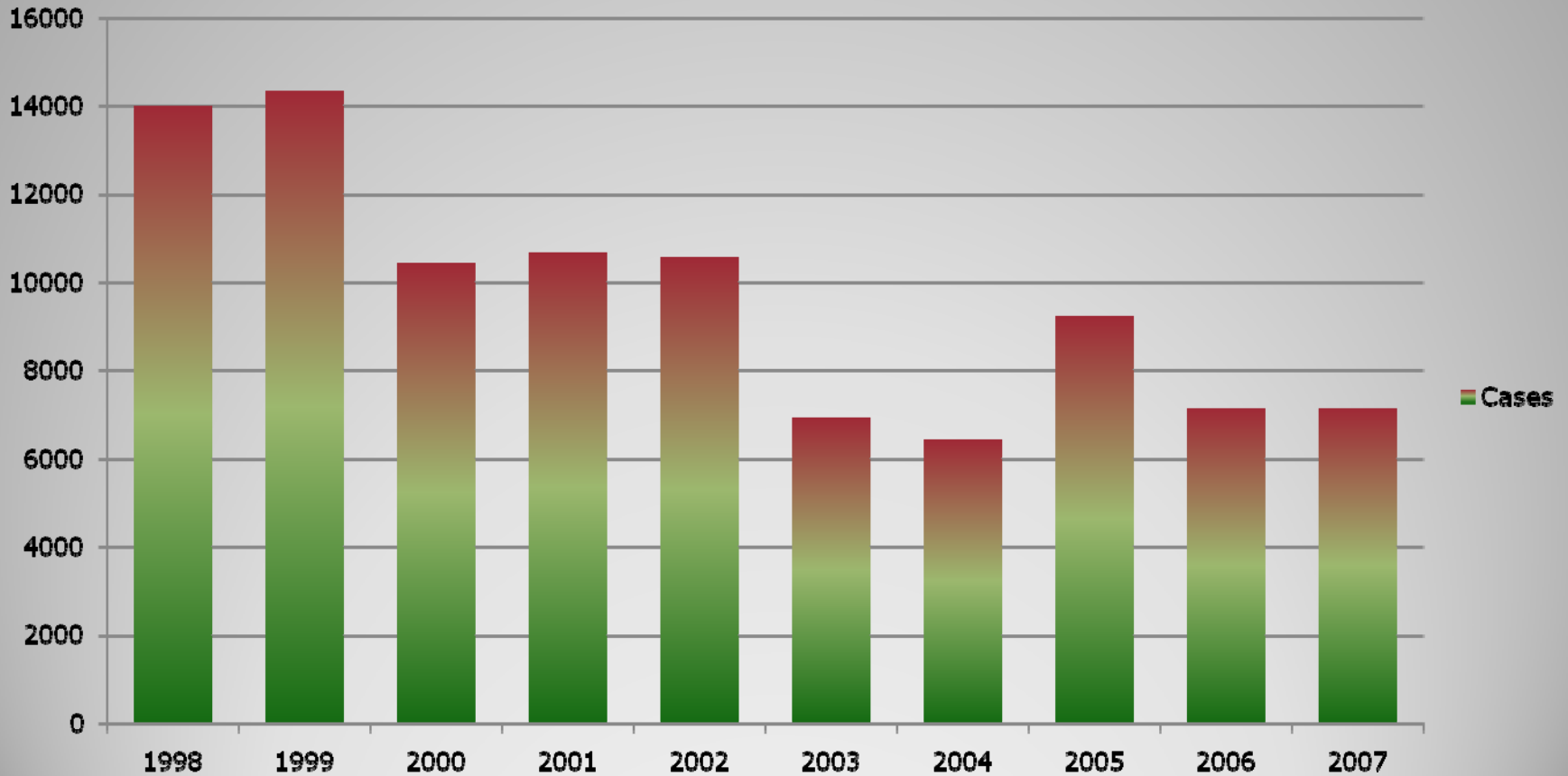
ECONOMIC BURDEN OF VIRAL HEPATITIS⁷

Hepatitis A	\$300 million
Hepatitis B.....	\$900 million
Hepatitis C	\$600 million
Total per year	\$1.8 billion

Ref: The Abcs Of Hepatitis: A Wbgh Business Consultation, Sponsored by the Centers for Disease Control and Prevention DEC. 12, 2000

Reported HAV Infection Cases In Turkey (1998-2007)

Cases

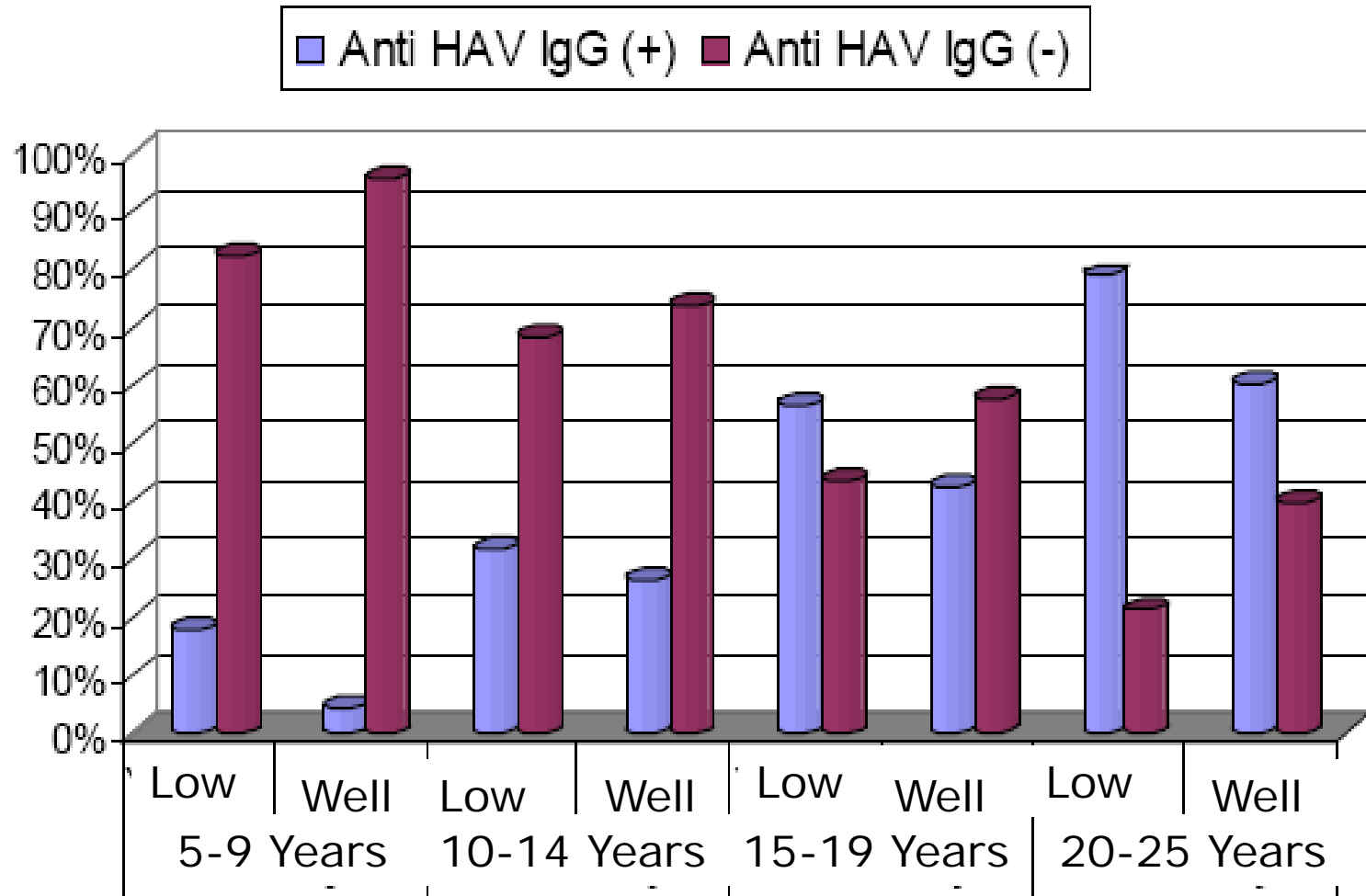


years

Cases and Morbidity of HAV Infection in Turkey

Years	No. of cases	Morbidity (Per 100.000 population)
1998	14000	20,0
1999	14323	20,5
2000	10435	14,9
2001	10661	15,2
2002	10558	15,1
2003	6919	9,9
2004	6435	9,2
2005	9229	13,2
2006	7137	10,2
2007	7137	10,2

Anti HAV Seroprevalence by Age Group and Socioeconomic Level (Göktas P, 2006)



Cases of Hep A	Unvaccinated	Vaccinated (18-54 months)	Vaccinated (18-24 months)
At birth	24.105	3.950	3.659
Personal contact	21.759	3.114	2.914
Overall	45.868	7.064	6.573

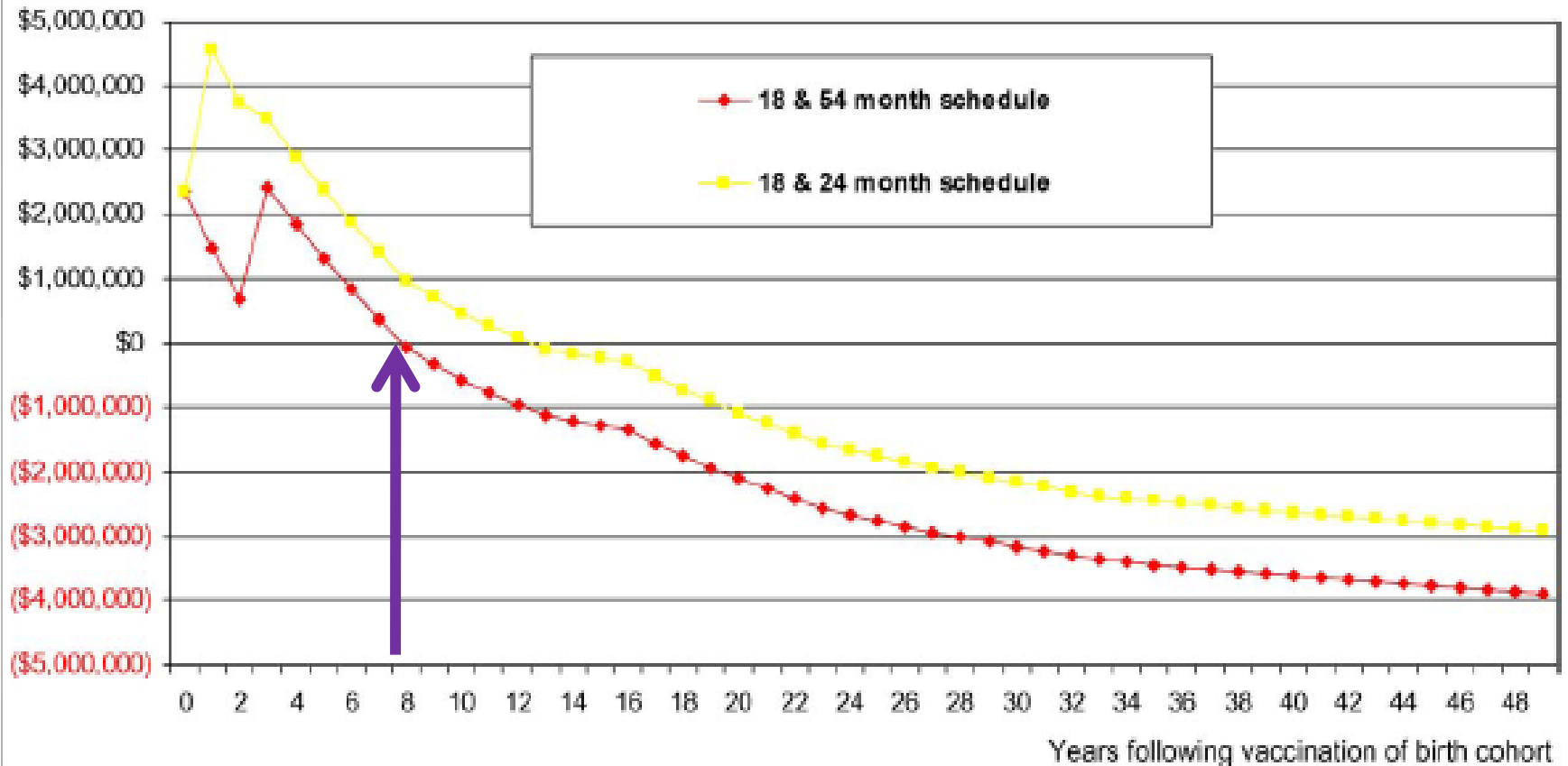
Vaccine is efficacy 84% for new cases if perform at first year of life. For suspected contact the prevention increase to 86%. If vaccine is performed for 18-24 month of age group, prevention was found 85-87%.

Ref: M.T.V alenzuela et al./ Vaccine 23 (2005) 4110–4119

Cost effectiveness of Hep A vaccine (USD)

	Unvaccinated	Vaccinated (18-54 months)	Vaccinated (18-24 months)
Vaccine cost	0	5.342.106	6.445.194
Medical cost			
Birth cohort	2.114.716	304.319	281.680
Personal contact	2.618.356	390.842	366.588
Total	4.733.072	695.161	648.268
Cost of absenteeism			
Birth cohort	2.350.000	538.014	496.827
Personal contact	3.993.194	612.859	574.250
Total	6.343.194	1.150.872	1.071.077
Total cost(Vaccine, medical and absenteeism)	11.076.267	7.188.139	8.164.540

Trends of Cost if added social perspective



Cost effectiveness findings in Various Studies

Study group	Finding
Universal childhood vaccination	\$ 12.780 (Region where prevalence is high)
Universal adolescent vaccination	\$ 13.722 (Region where prevalence is high)
MSM	Cost saving
Workers in restaurants	\$ 14.206 (Region where prevalence is high)
Nurseries	Cost saving
Chronic Hep C carriers	US\$ 12,671 (for 30 age group), US\$ 39,922 (for 45-50 age group)

Inputs:

- Prevalence: %5-9
- Case fatality ratio: 1-2.75/100,000 (MoH)
- Hospitalization rate: 1.9%
- Cost of outpatient case: 213-438 TL
- Cost of hospitalization: 2100-3100 TL
- Cost of vaccine: 35 TL
- Coverage of vaccination
 1. Dose: 80%
 2. Dose: 65 %
- Efficacy of vaccine: 85-95%

Estimation of Cost Effectiveness for Turkey

		Confidence Interval (%95)	
Cases if no vaccination	261.919	259.142	264.441
Cases if vaccination	155.858	154.276	157.440
Med. Cost if no universal vaccination (TL)	266.361.575	254.751.880	277.971.269
Med. Cost if universal vaccination (TL)	105.132.291	100.537.181	109.727.401
Cost of vaccines (TL)	16.468.695.	16.468.682	16.468.708
Total Cost (TL)	121.600.987	117.005.876	126.196.098
Incremental cost (TL)	-144.760.587	-151.777.499	-137.743.676
ICER per year (TL)	-706,05	-753,09	-659,02

- Although additional costs are included, childhood immunisations have generally been cost saving.
- Vaccine related expenses are low by other spending.
- This recommendation is probably justified, but future childhood vaccine recommendations should be evaluated carefully.

**THANK YOU FOR YOUR
ATTENTION**