

# Economic analysis of the universal HBV vaccination 20 years after introduction

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# Economic analysis:

- defines,
  - measures,
  - evaluate
- and
- compare

**Costs**

and

**Consequences**

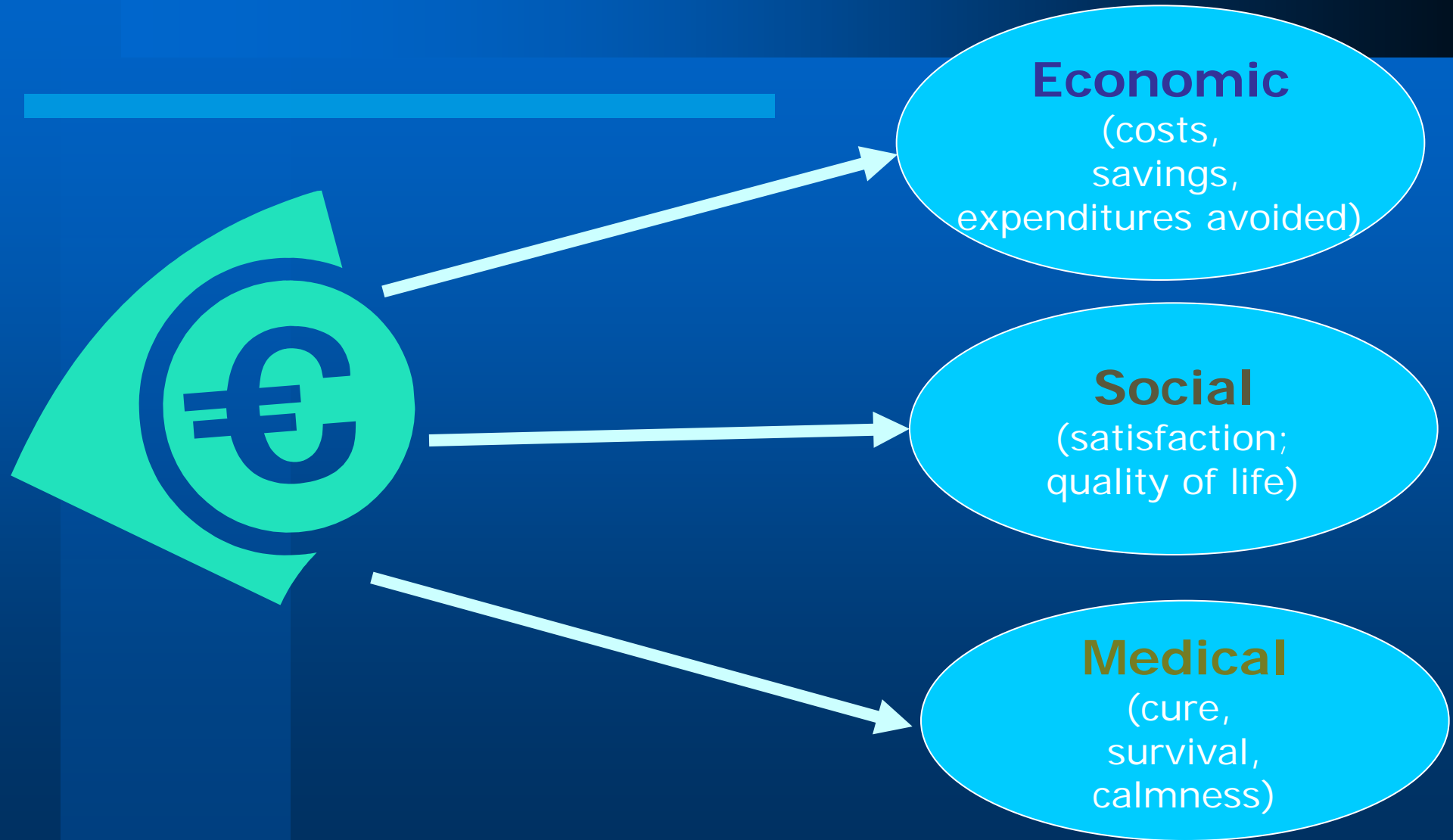
# Main Question

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- Does the costs paid for the health care services worth the results that we receive in exchange?
- In case of resources allocation – What additional benefits will be received choosing **A** instead of **B**?

# Costs

# Results



# Consequences of the vaccination

- **Economic:**

- Avoiding the costs of the treatment of infection diseases;
- Avoiding the costs of complication therapy;
- Avoiding the costs of future patients therapy.

- **Social:**

- Savings from the decreased productivity and disability.
- Increase in the total quality of life.

- **Medical:**

- Increasing life expectancy to all vaccinated;
- Lack of infections;
- Avoiding development of expensive diseases.

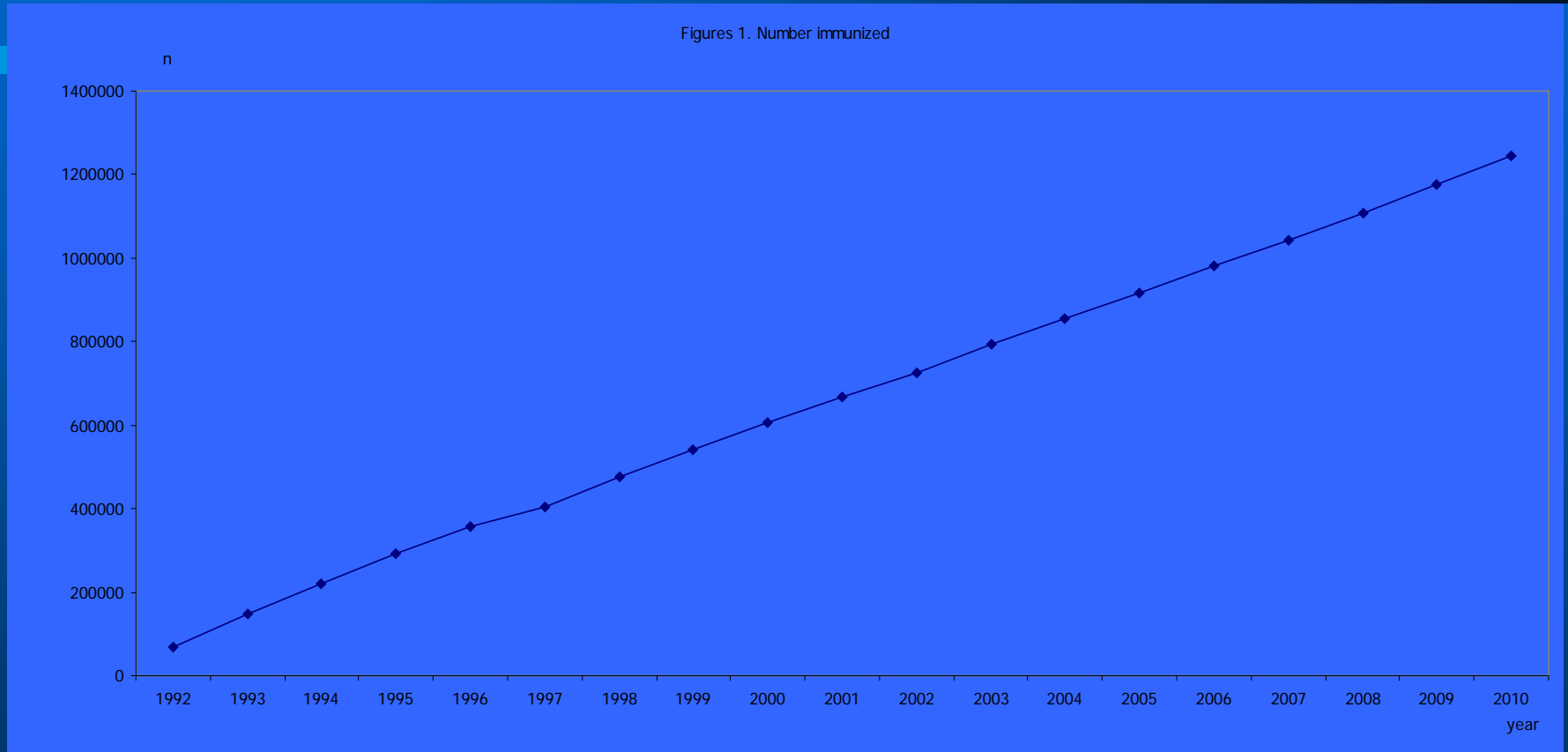
# Goal

- To evaluate the economic results of the introduction of obligatory vaccination against HBV 20 years after its introduction.
- Prospective epidemiological 20 years study and retrospective cost study;
- Period 1992 – 2010;

# Materials and methods

- Epidemiology analysis :
- Avoided cases per year – (average number of infected till 1992 - number of infections after vaccination introduction).
- Epidemiology data – HBV infections during 20 years period - NCIPD;
- Statistical data – newborn cohorts from NSI.
- Complications after chronification (7% of infected cohort);
- Hospitalization due to complications (30% per years from the complicated cases)
- Cost analysis – (cost of vaccination+ cost of acute cases therapy+ cost of possible complications) – (avoided costs of acute therapy + complications):
- Costs of vaccination – NCIPD data and vaccines prices;
- Cost of infected patients and avoided cases therapy – hospital charges, hospital medicines therapy, ambulatory medicines therapy (NHIPD, NFC).

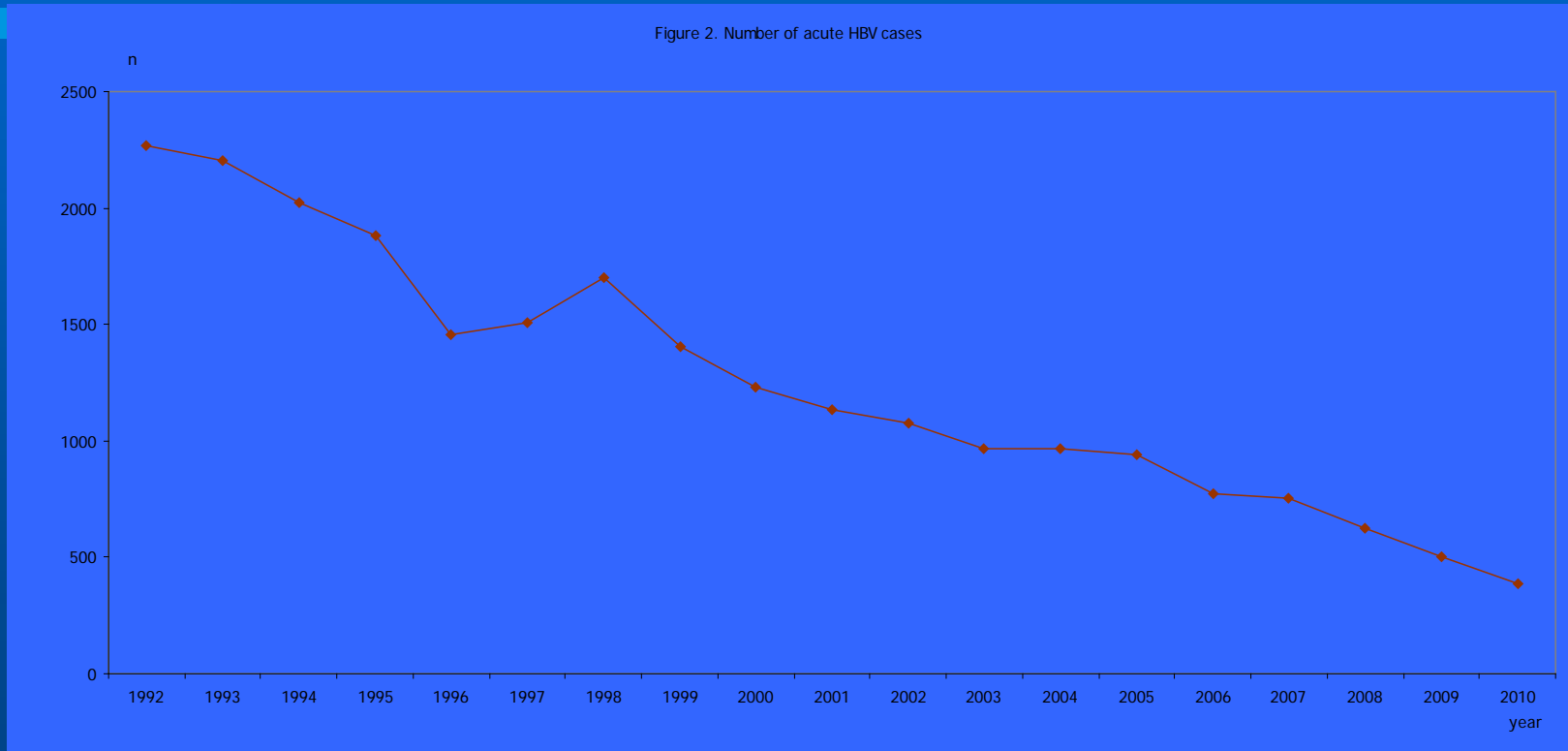
# Number of vaccinated persons



Number of vaccinated is varying from 68 393 to 1246018, thus reaching near 95% coverage of all every cohort of new born individuals in 2010



# Number of acute HBV cases after the introduction of the obligatory vaccination



Number of acute HBV cases decline from 2268 to 387.

# Number of acute cases and avoided infections

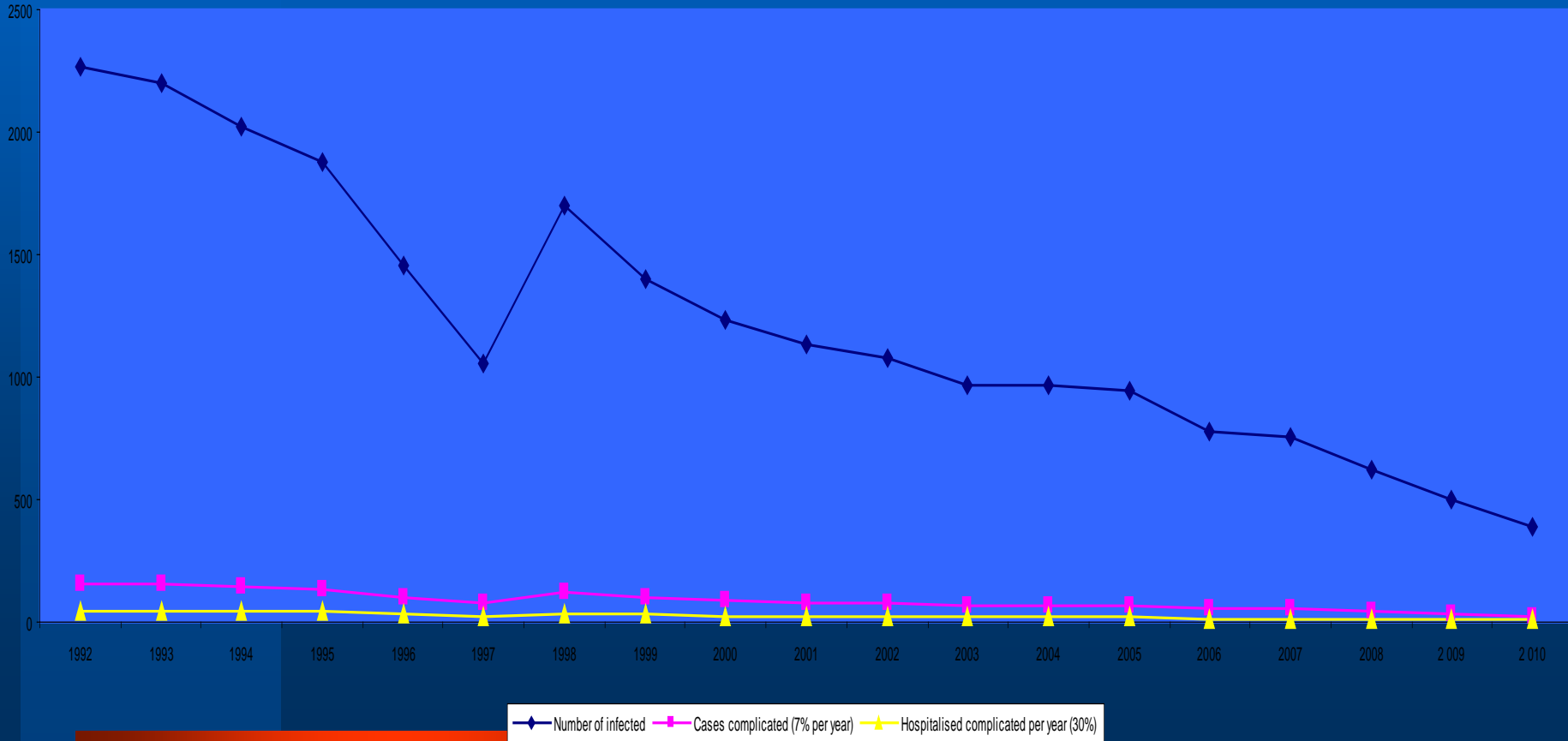
Figure 3. Number of acute HPV cases and avoided cases



Avoided acute infections increased from 449 to 2330 in 2010 (the average number of acute cases till 1992 was 2717 per year)

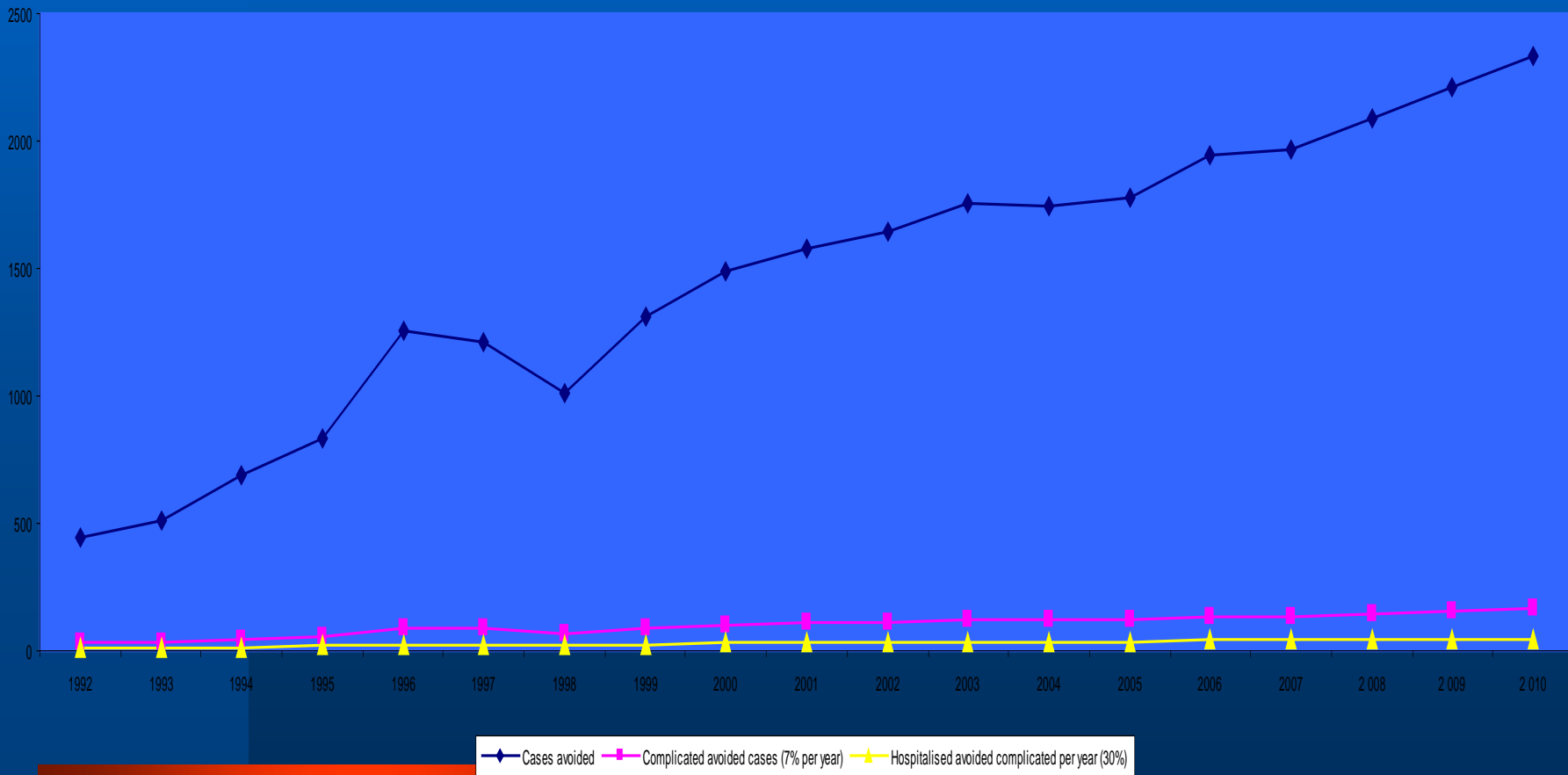
# Cohort of infected cases – acute, complicated and hospitalized

Figure 4. Cohort of infected cases



# Cohort of avoided cases – acute, complicated and hospitalized

Figure 5. Cohort of avoided cases



# Therapy costs of infected individuals during the whole period (BGN)

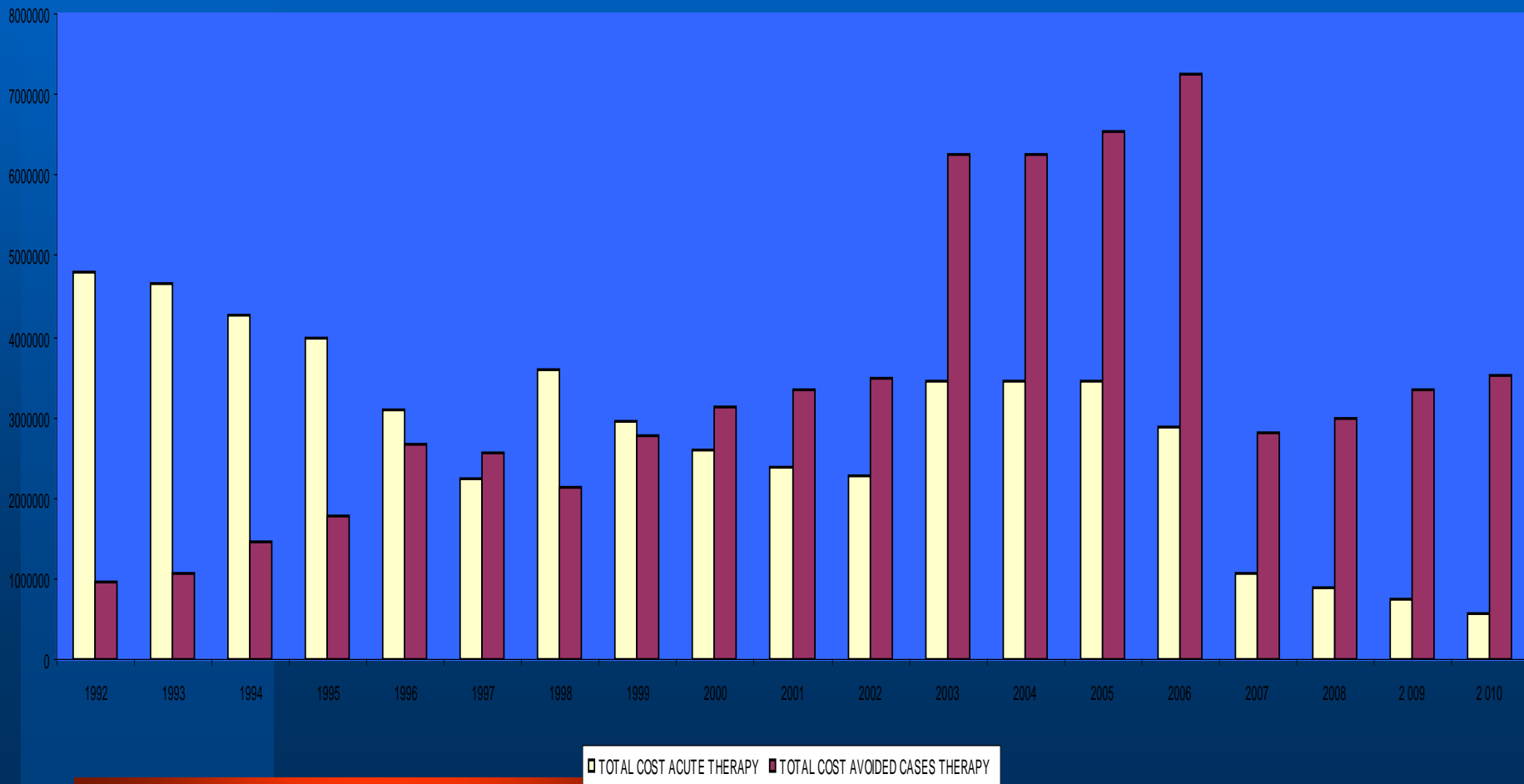
<b>Hospital cost of infected cases</b>	<b>15834837</b>
<b>Ambulatory medicines cost of infected cases</b>	<b>4028454</b>
<b>TOTAL</b>	<b>19863291</b>
<b>Hospital cost of chronic cases</b>	<b>347459</b>
<b>Ambulatory medicines cost of chronic cases</b>	<b>33226658</b>
<b>TOTAL</b>	<b>33574116</b>

# Therapy costs of avoided infections during the whole period (BGN)

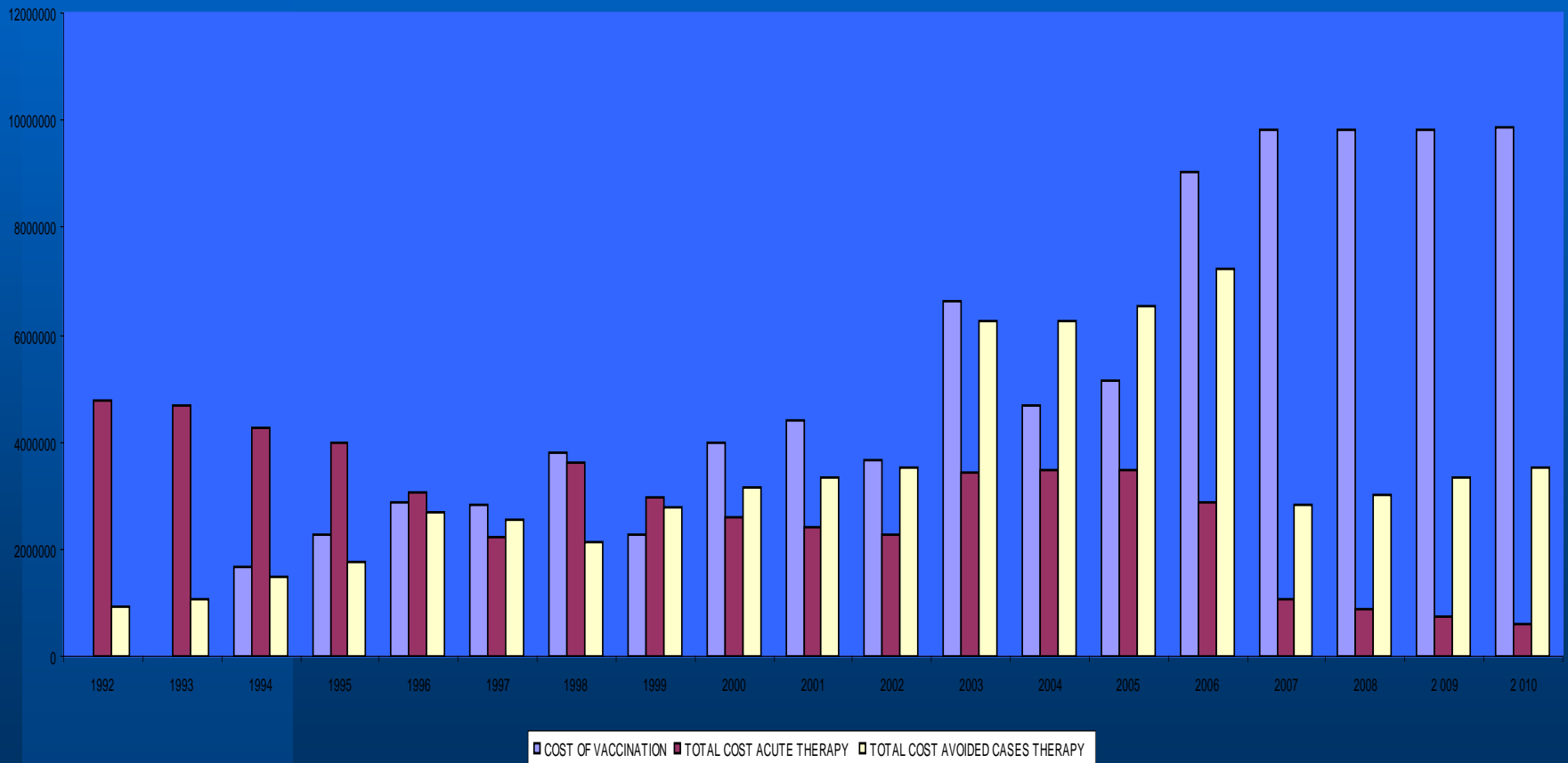
<b>Hospital cost of avoided acute infections</b>	<b>20133324</b>
<b>Ambulatory medicines cost of avoided infections</b>	<b>5550296</b>
<b>TOTAL</b>	<b>25683625</b>
<b>Hospital cost of avoided chronic cases</b>	<b>422800</b>
<b>Ambulatory medicines cost of avoided chronic cases</b>	<b>38277274</b>
<b>TOTAL</b>	<b>38700074</b>

# Total cost of infected against cost of avoided cases per year (BGN)

Figure 6. Cost of acute cases therapy against cost of avoided cases therapy



# Cost of vaccination, cost of infected and avoided cases per year (BGN)





# Cost-benefit results for the whole period

**(Total cost of immunization for 20 years + Total cost of acute infections) – Total cost of avoided infections =**

$$= (92556808 + 53437407) - 64383699 = 81610517$$

# Conclusion

- The cost of immunization and acute cases therapy decreased but it is still higher than the benefits in terms of avoided cases and their therapy cost.
- No indirect costs were added calculated that will change the proportion.
- The main determining variables appears to be the cost of immunization and medicines cost for the treatment of chronic cases.