

# (Lack of) evidence for universal hepatitis B immunisation

The Netherlands

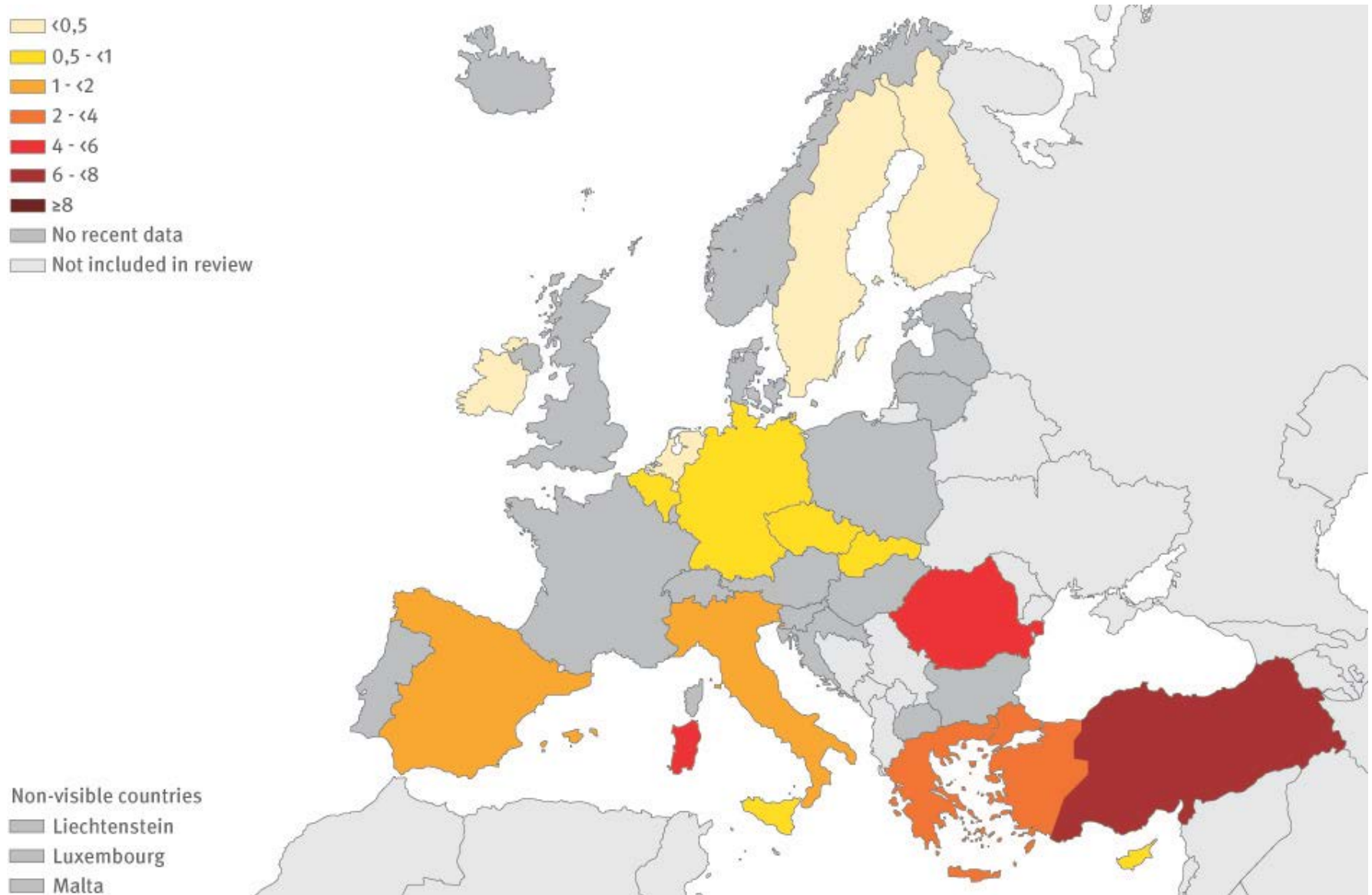
Hans Houweling

Hieronymus Bosch – The Prodigal Son (The Vagabond), 1487-1516,  
Museum Boijmans-van Beuningen, Rotterdam



# Hepatitis B prevalence (% HBsAG) in the general population by country, Europe, 2000-2009

Source: Hahné et al, BMC Infect Dis 2013; 13: 181

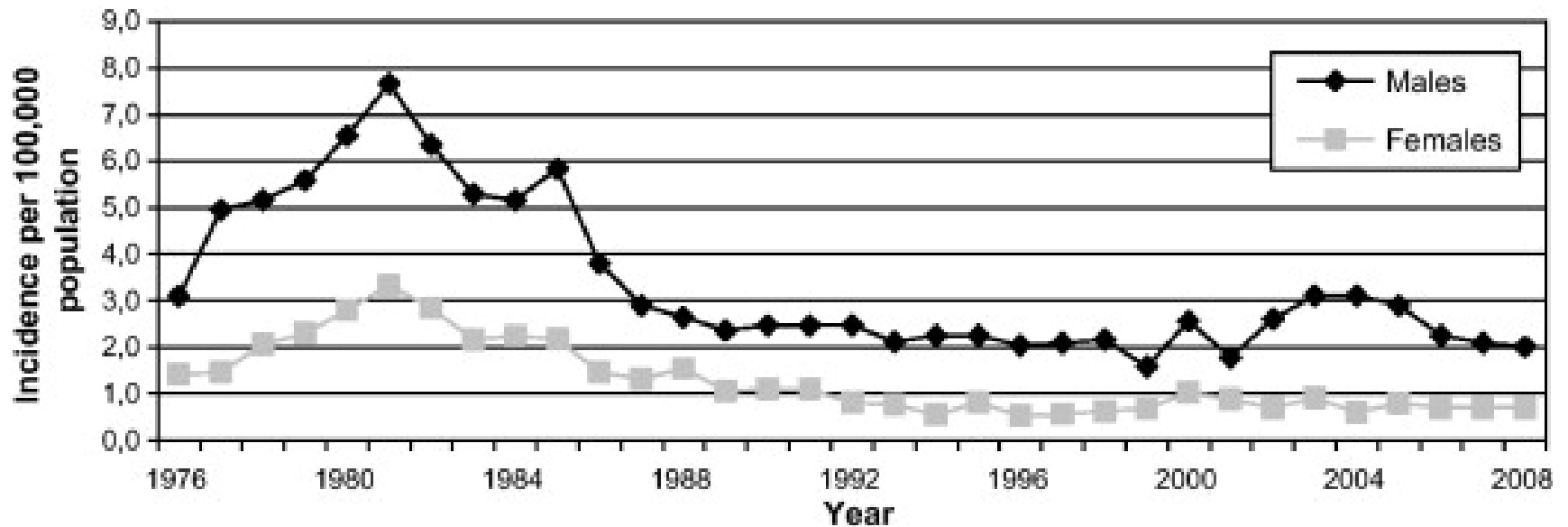


# Hepatitis B vaccination programmes in the Netherlands

- Children born to carrier mothers, from 1989: >90% effective
- Health care workers, intensified from 2001: part of training
- Programmes targeted towards risk groups: homo/bisexual men, injecting drug users, promiscuous heterosexuals: outreaching, (rather) good coverage, intensified from 2002
- Children who have one or both parents from a high or middle risk country, 2003-2011
- Universal infant vaccination, from 2011



Reports of acute hepatitis B among males and females in the Netherlands, 1976–2008, per 100,000 people per year (Houweling et al, Vaccine 2010; 28: 7723-30)



George E.P. Box (1919-2013):

“Essentially, all models are wrong, but  
some are useful”

# Modeling cost-effectiveness of universal vaccination against hepatitis B in the Netherlands

- Eelkman Rooda (1994): favourable; assumed savings could be reached on screening of blood donors and pregnant women
- De Wit (2000): unfavourable; rate of HbsAg carriership strongly dependent on immigration, CER: 25,000-57,000 EURO/lyg
- Kretzschmar (2009): favourable; horizontal transmission included along vertical and sexual transmission; universal strategies compared with targeted approaches: screening of pregnant women, vaccination children of immigrants and risk group members

# Public debates on vaccination

Conscientious objections:

- Religious, Bible Belt
- Antroposophics, specific schools
- ‘Highly-educated people in Amsterdam ring of canals’

Low public profile of target diseases

Participation in NIP mostly because ‘everybody does so’

No active assessment of information

Public maturity

>>> vulnerable



# Criteria for inclusion of vaccinations in public programmes (Houweling *et al*, Vaccine 2010; 28: 2924-31)

1. The infectious disease is serious for individuals and has the potential to affect a large number of people
2. Vaccination is effective for the prevention of disease or the reduction of symptoms
3. Adverse effects are not sufficient to substantially diminish the public health benefit
4. The inconvenience or discomfort of **the individual vaccination** is not disproportionate to the health benefit
5. The inconvenience or discomfort of **the vaccination programme as a whole** is not disproportionate to the health benefit
6. The cost-effectiveness ratio compares favourable with other means of prevention
7. Provision of vaccination serves a (potentially) urgent public health need

# Criteria for inclusion of vaccinations in public programmes (Houweling *et al*, *Vaccine* 2010; 28: 2924-31)

1. Is it a public health problem?
2. Is the vaccination effective?
3. Is the vaccination safe?
4. Is the vaccination acceptable as such?
5. Is the vaccination acceptable as part of the whole programme?
6. Is the vaccination cost-effective?
7. Is the vaccination urgent?

# Assessment of universal vaccination against hepatitis B, the Netherlands

Is hepatitis B still a public health problem (criterion 1)?

- Hepatitis B serious, but uncommon in Northwestern Europe, mostly limited to specific risk groups
- Transmission patterns in migrant populations may mirror those in countries of high endemicity:
  - > include horizontal transmission
- No known risk factor in quarter of acute cases

Yes



# Assessment of universal vaccination against hepatitis B, the Netherlands

Is vaccination effective and safe (criteria 2 + 3)?

- Vaccines: efficacious and safe
- Insufficient coverage of vaccination among homosexual men, despite intensive outreaching programmes, up to 50 % not protected
- Difficult to compare targeted approaches and universal vaccination

> modeling

? / Yes



# Assessment of universal vaccination against hepatitis B, the Netherlands

Is universal vaccination acceptable, both individually (criterion 4) and within the programme as a whole (criterion 5)?

- Vaccination not beneficial for most people, so only acceptable from public perspective, because targeted approach does not reach risk groups sufficiently
- Offers best protection for population as a whole and for risk groups
- Poses limited or no additional vaccination burden
- Can be incorporated in NIP easily

Yes / Yes



# Assessment of universal vaccination against hepatitis B, the Netherlands

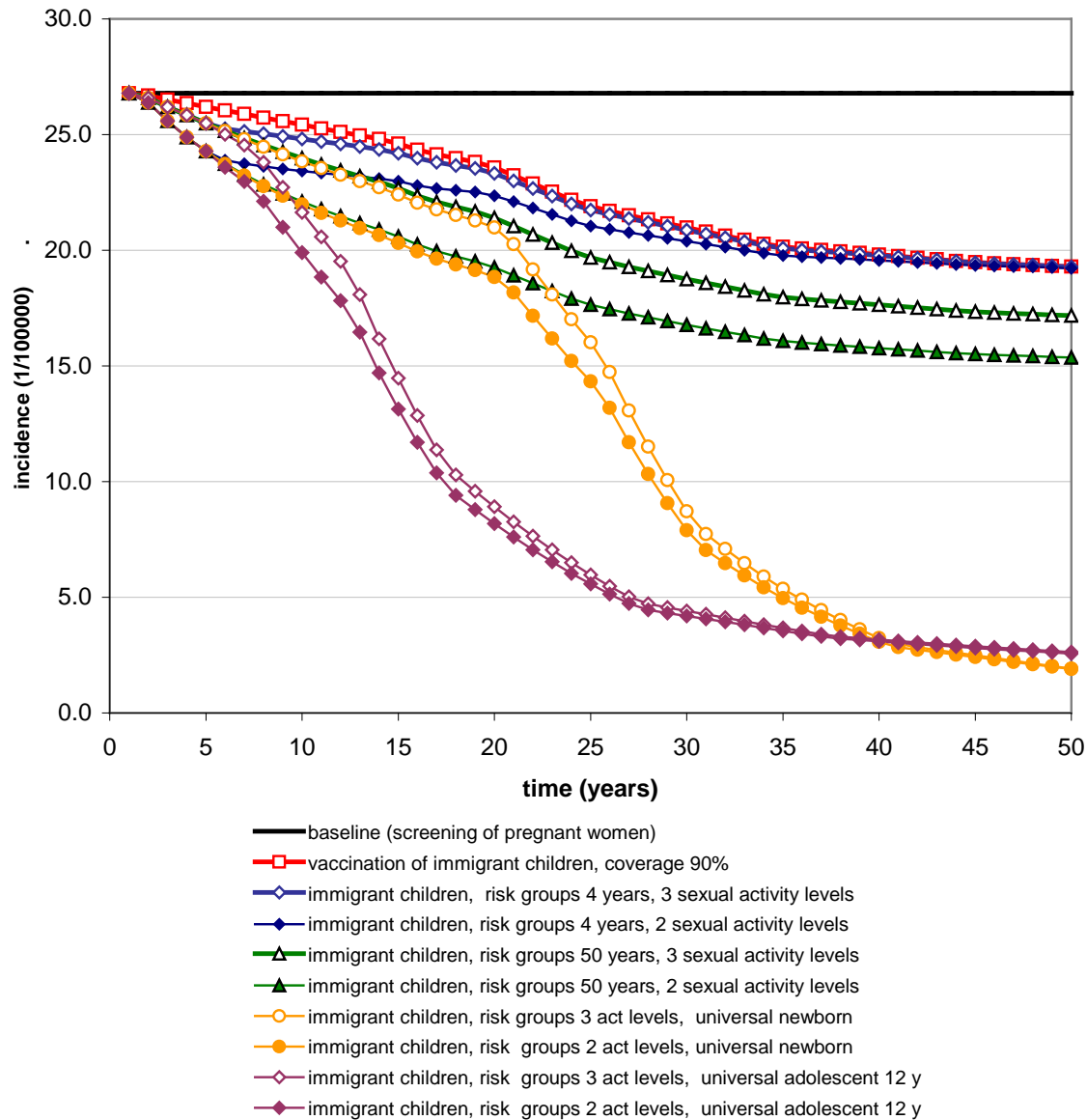
## Is universal vaccination efficient (criterion 6)?

- Likely to prevent 5000 (universal vaccination) + 650 (catch up) extra mortalities over 50-year period
  - CER of universal vaccination  
2,300-4,800 €/QALY gained for infants  
2,000-4,200 €/QALY gained for 12-year olds  
depending on prevalence scenario
- 5,000-10,000 €/QALY gained for 11-year catch up of 12-year olds

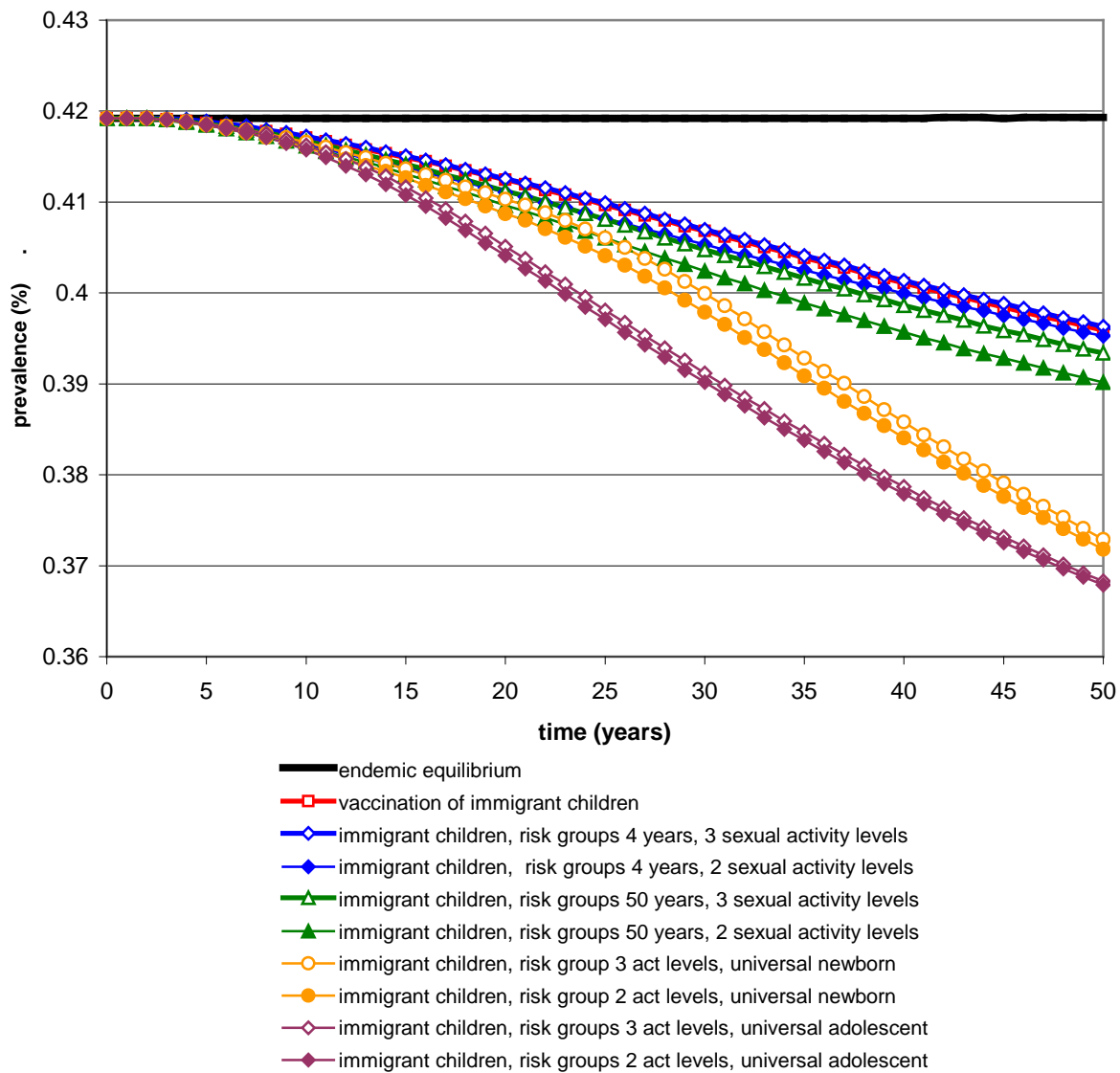
Yes



# Effect of different vaccination strategies on the incidence of hepatitis B Infections, the Netherlands (Kretzschmar *et al*, Vaccine 2009; 27: 1254-60)

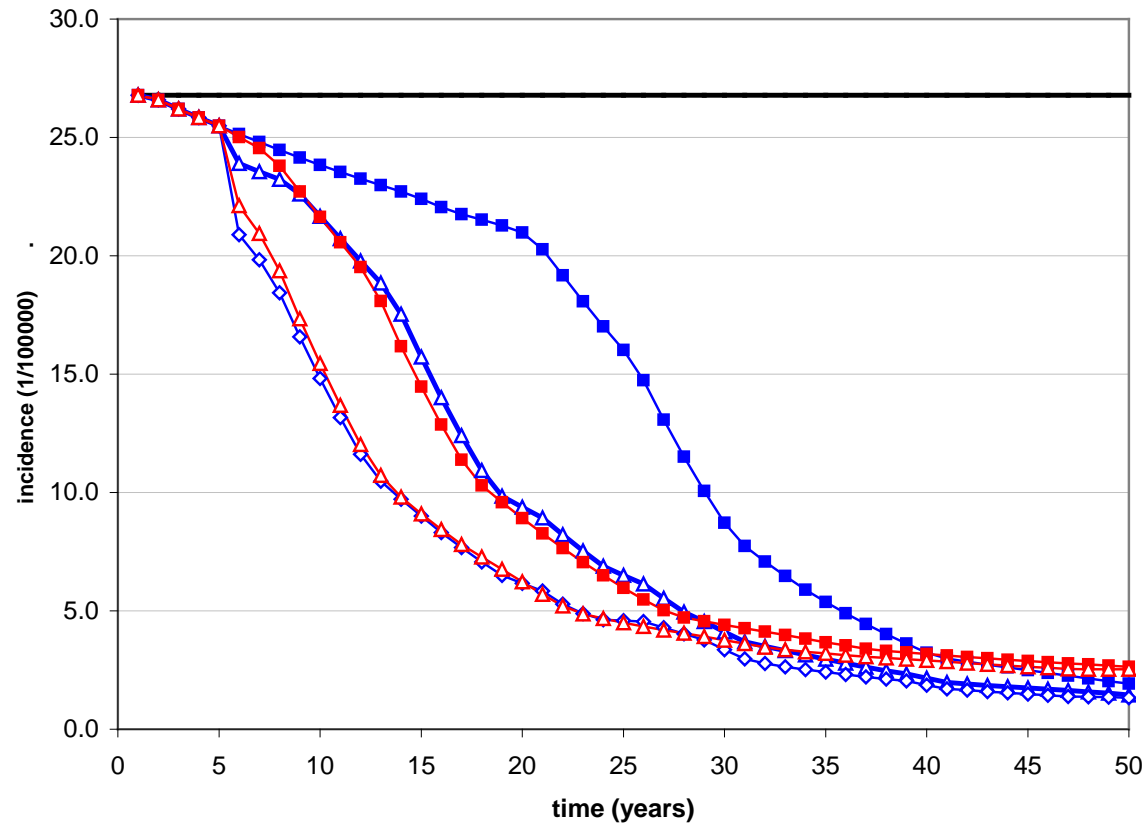


# The effect of different vaccination strategies on the prevalence of HBV carriage, the Netherlands (Kretzschmar *et al*, Vaccine 2009; 27: 1254-60)





Effect of different vaccination strategies on the incidence of hepatitis B infections, including catch-up campaigns, the Netherlands (Kretzschmar *et al*, Vaccine 2009; 27: 1254-60)



- baseline (screening of pregnant women)
- universal newborn vaccination, no catch-up
- ▲— universal newborn, catchup 0-12 yrs
- ◇— universal newborn, catchup 0-18 yrs
- universal adolescent vaccination, no catch-up
- ▲— universal 12 year old, catchup 12-18 yrs

# Assessment of universal vaccination against hepatitis B, the Netherlands

## Is universal vaccination a priority? (criterion 7)

- Targeted approach is not sufficient
- Universal vaccination offers additional health benefit for population as a whole and specific risk groups
- Universal vaccination serves a public health priority

Yes



# Health Council advice, March 2009

1. Universal vaccination of infants
2. 11-year catch up of 12-year olds
3. Continue targeted programmes until vaccinated cohorts have reached age at which at risk
4. Consider need for booster

Alternative: universal vaccination of 12-year olds

Ministerial decision: implement universal infant vaccination by October 2011, no catch up

