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Epidemiology of HAV, HDV and HEV in Belgium

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HAV surveillance in Belgium

- Epidemiological data:

  Sentinel labs since 1994

  101 labs (+- 58% coverage)

  IgM+, Ag+ and/or PCR+ cases

- Mandatory notification in 3 regions

- Not included in scope of National Reference Centre for Hepatitis Viruses (B, C, D, E)

- Vaccination recommandations:

  MSM, travellers, risk groups, food workers

Sentinel laboratories
Notification rate confirmed cases

Decreasing incidence

1982-84: 72/100000*

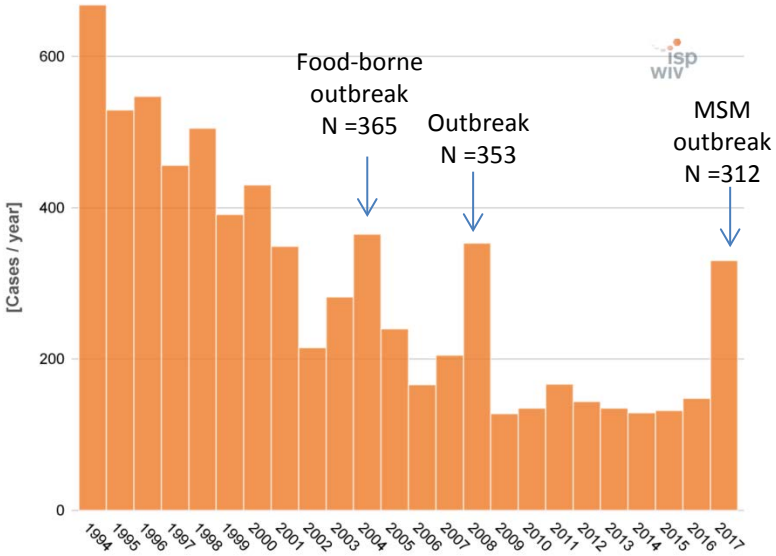
1991-92: 23/100000*

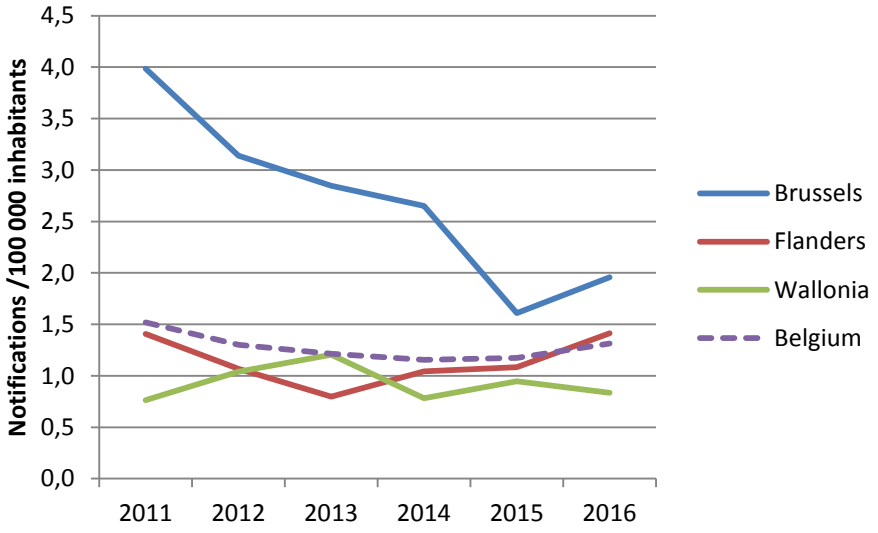
2011-2016: **1,1 – 1,5/100000**

Stable since 2009: 128-167 cases/year

Highest in Brussels

Comparable to neighbouring countries





*High Health Council 2013 Advice 8815

Age, gender and season

Age:

5-9 y: most cases

15 – 49 y: decreasing incidence

≥ 70 y: increase

Gender:

M/F: 0,73 (2015) to 1,46 (2011)

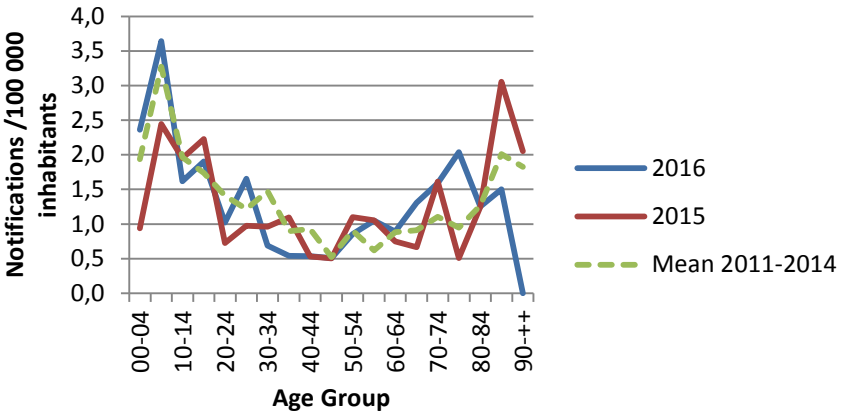
<10 y: more males

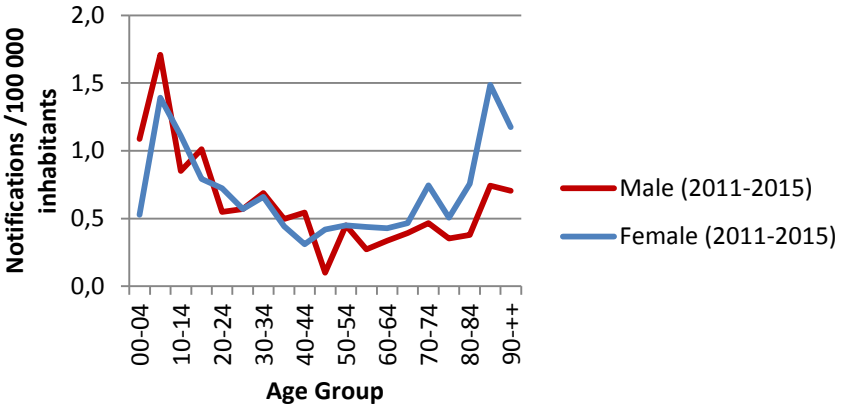
>70 y: more females

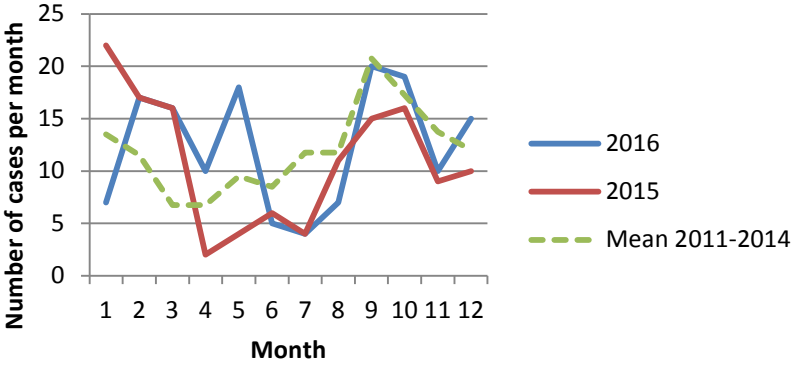
Season:

Highest in **fall** (Sept – Oct)

Travel-related ?







HAV seroprevalence

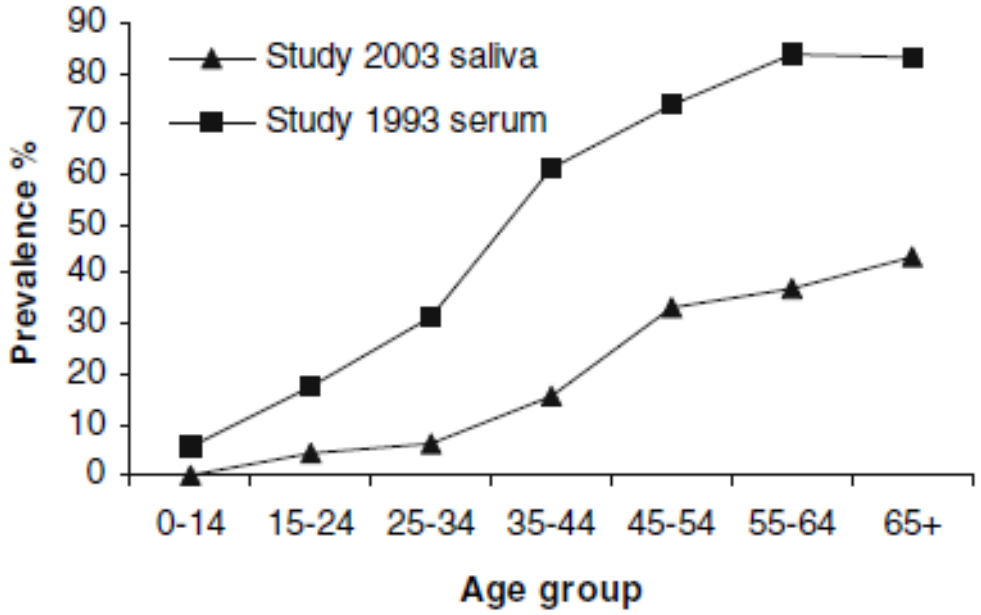
1993: 55% (serum, Flanders)

50% > 40y

2003: 20% (oral fluid, Flanders)

16% > 40y

2018: new study WIV



Quoilin *et al*. Eur J Epidemiol. 2007;22(3):195-202

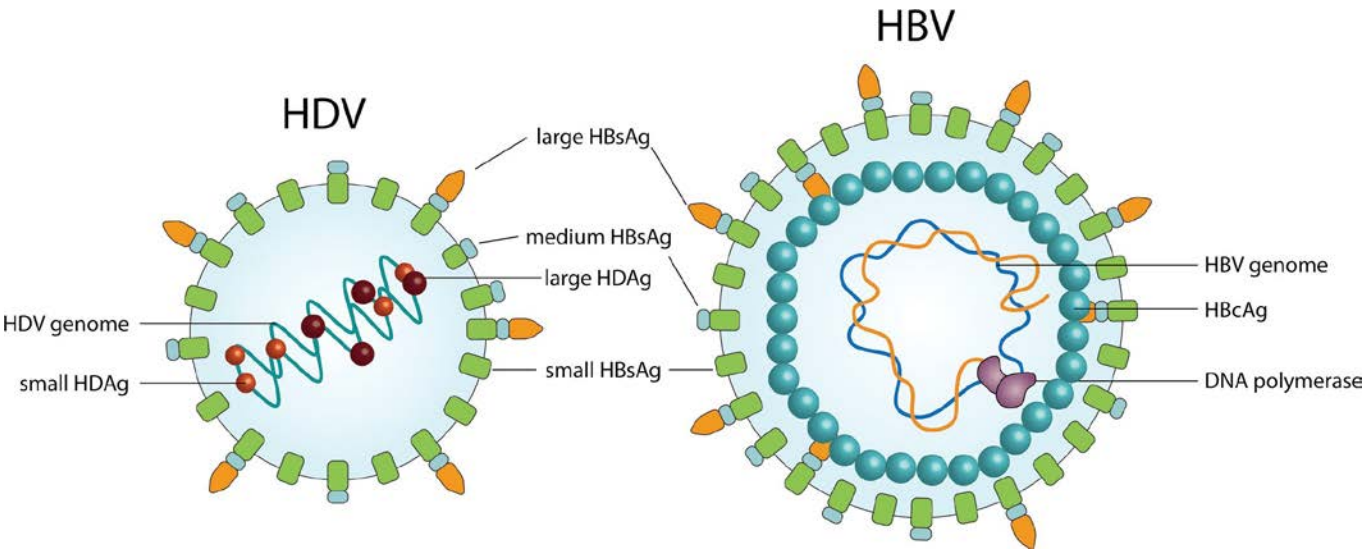
Beutels *et al*. Eur J Epidemiol. 1997 Apr;13(3):275-80

HAV conclusions

- Decreasing incidence
- Mostly travel-related and children
- Need for more sequencing data (food-borne outbreaks)
- Progressive increase of susceptible population (ageing)

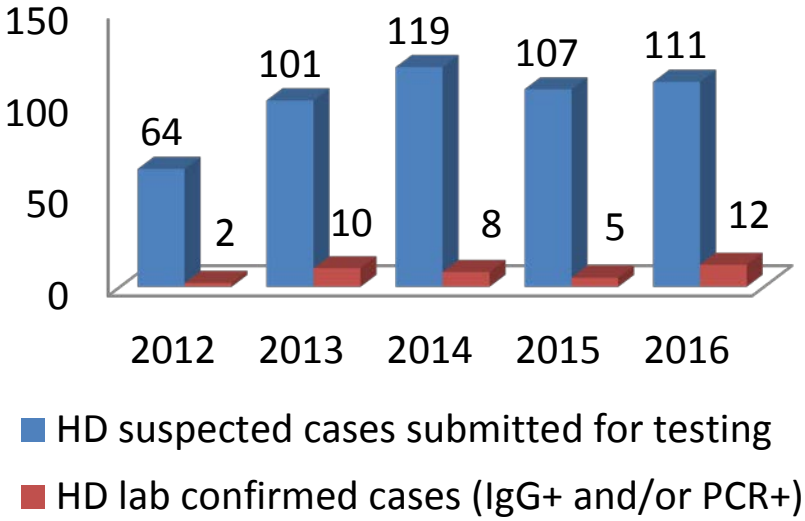
HDV surveillance in Belgium

- Lack of epidemiological data
- Analysis of HDV antibodies only in a few laboratories
- Not reported by sentinel laboratories
- No mandatory notification
- Confirmed cases reported by NRC (Antibody+, PCR+)



HDV surveillance in Belgium

- National Reference Centre:
  - **5-12 cases** confirmed/y
  - 100-120 serology or PCR requests/y
  - 6% positivity rate

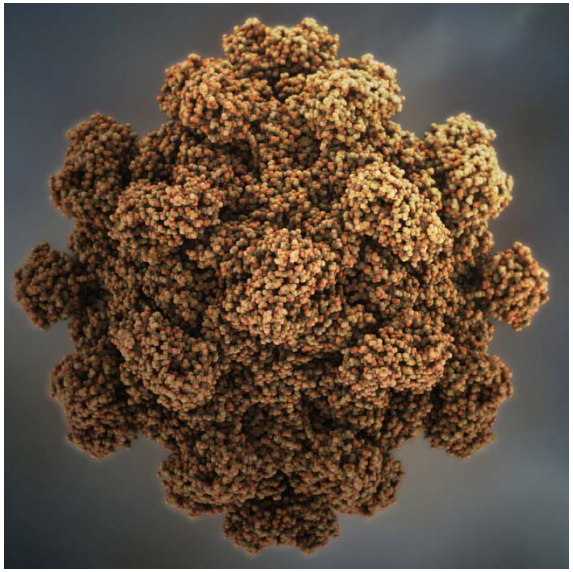


- 1 cross sectional multicenter study 2008-2009 (BASL)*:
  - **5,5% co-infection** (44 HDV+/800 HBVsAg+)
  - 13.6% (6/44) also infected with HCV
  - Mostly male migrants
  - Screening for HDV co-infection should be reinforced

* Ho *et al*. J Med Virol. 2013 Sep;85(9):1513-7

HEV surveillance in Belgium

- **2010: National Reference Centre (NRC)**
- 2014: Sentinel Laboratory reporting
- No mandatory notification



From: Inst. for Molecular Virology, Wisconsin

HEV genotypes

HEV genotype	Host	Geographic distribution
1	**Human**	**Asia, Africa**
2	Human	Mexico, Africa
3	**Animal > human**	**Worldwide**
4	Animal > human	China, South-East Asia

Genotype 1:

- acute hepatitis
- 20% case-fatality rate in pregnant women
- Faecal-oral, water-borne
- Large outbreaks in Africa and Asia

Genotype 3:

- Mostly mild, subclinical (>95%)
- Sometimes acute or chronic hepatitis, extrahepatic: GBS, neuralig amyotrophy
- Immune suppressed, transplant recipients
- Food-borne, zoonotic
- Sporadic cases

Seroprevalence humans

- 2012: Fertility center and orthopedic clinics UZ Gent (patients from East and West Flanders): **14%** (Wantai ELISA, Van Hoecke *et al*.)
- 2012: Healthy factory workers Gosselies (n = 200): 8,5% (Mikrogen ELISA)
- NRC sera suspected patients:
  2010 - 2014: 10% (Mikrogen ELISA)
  2015 - 2017: **16%** (Wantai ELISA)
- Planned: cross-sectional seroprevalence study Belgian population (Wantai ELISA)

Van Hoecke *et al*. Acta Gastroenterol Belg. 2012 Sep;75(3):322-4

National Reference Centre (NRC) at WIV
Notification rate confirmed cases

- Data will be published soon

Positivity rate confirmed/suspected cases submitted to the NRC

- Data will be published soon

Genotyping Belgian HEV

- Data will be published soon

Phylogeny genotype 3 isolates Belgium 2010-2016

- Data will be published soon

Notification rate per province (Gt3) 2010-2016

- Data will be published soon

Age, gender, season

- Data will be published soon

HEV domestic pigs Belgium

- 2008 (Hakze-van der Honing *et al*.) :

  Fecal samples:

  - **7%** (8/115) HEV+
  - 1 HEV-3f and 4 HEV-**4**b
  - First isolation of Genotype 4 in swine in Europe

- 2010-2011 (Thiry *et al*.):

  Sera:

  - **73%** seroprevalence
  - **1%** (4/420) **HEV+**
  - HEV-3f (cfr humans)

Hakze-van der Honing *et al*. PLoS One. 2011;6(8):e22673
Thiry *et al*. Vet Microbiol. 2014 Aug 27;172(3-4):407-14

HEV wildlife Belgium (2010-2012)

- Wild boar:
  - **Antibodies: 34%**
  - **HEV-3 RNA: 7%** (4/61) livers
    6% (4/69) sera

- Red deer:
  - Antibodies: 1% (roe deer: 3%)
  - HEV-3 RNA: 3% (1/29) livers

Wild boar can be considered as a host reservoir

Thiry *et al*. Transbound Emerg Dis. 2017 Jun;64(3):764-773

Conclusions HEV

- Confirmed cases tripled since 2010
  Mostly locally acquired genotype 3 cases
  Similar subtypes as in swine and wild boar
  Higher incidence in French-speaking provinces

- Increased awareness and testing
  True emergence of HEV-3c: from rare to dominant subtype

- Notification rate and seroprevalence relatively low compared to other EU countries

- More data needed on the epidemiology in swine – infectivity in food
  Recommendations to prevent infection in vulnerable people needed

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Belgian Sentinel Laboratories