

# **Epidemiology of Viral Hepatitis in Bulgaria**

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**VHPB meeting, 24-25 March 2011, Sofia, Bulgaria**



# Surveillance of VH: from case to analysis registration, notification, case definitions, data flow ...

- Registration of viral hepatitis in Bulgaria is introduced in 1952
- Since 1983 registration of VH is separated into: HAV, HBV and HV NANB
- Later, due to improvement of specific lab tests additional hepatitis markers were introduced and HDV and HCV surveillance is incorporated in the Surveillance system of VH .
- Since 2005 surveillance system is updated according to the requirements of the EU:
  - case definitions for acute HAV, HBV, HCV & chronic HBV, HCV were accepted;
  - cases are arranged in groups according to sex , age, category;
  - additionally annual data for new asymptomatic HBsAg careers is collected as well as data for chronic HBV and chronic HCV
  - VH surveillance covers acute cases of HAV, HBV, HCV, HDV, VH unspecified.

**ORDINANCE № 21**  
**of 18 July 2005**

**On the procedure for registration, notification and reporting of communicable diseases**

**Article 2.** The communicable diseases specified in Annex 1 are subject to **obligatory registration, notification and report.**

(3. Viral hepatitis:

13.1. **acute viral hepatitis A, B, C, D, unspecified**

13.2. **chronic viral hepatitis B, C, D**

**Article 8.** The notification of the communicable diseases under article 6 and the positive laboratory results under article 7 is made with a rapid notification in the form stipulated in Appendix № 6, and via telephone, fax or e-mail. **The rapid notification specifies the case category** as per article 3, paragraph 1.

**Article 12.** (1) In case of a proven infection carrying, the carriers of the infection are reported with a rapid notification only upon detection.

(2) The **chronic diseases** (brucellosis, tuberculosis, chronic virus hepatitis) are reported once upon detection.

**Article 17.** Each case of an epidemic outbreak will be **immediately reported** to the Regional Inspectorate for Protection and Control of Public Health by the medical specialist who has detected it.

**Article 18.** Each case of hospital infection outbreak will be reported as provided for by the ordinance under article 60, paragraph 4 of the Health Act..

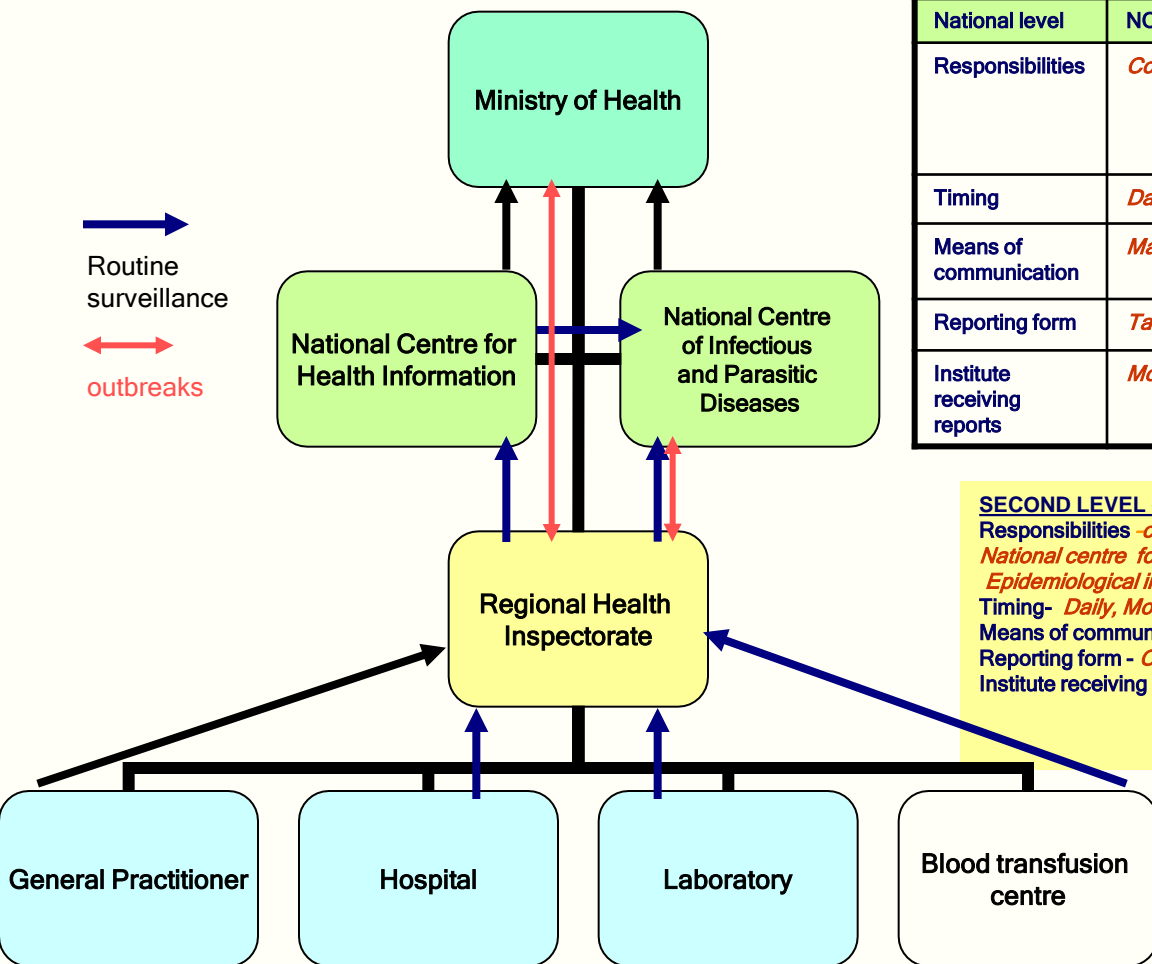
# Case definitions for Acute Viral hepatitis

	Clinical Criteria	Laboratory criteria	Case Classification
<b>Acute HAV</b>	Symptomatic cases with typical clinical picture of hepatitis with gradually development of symptoms (fatigue, abdominal pain, loss of appetite etc.)  <b>and jaundice</b>  <b>or elevated serum aminotransferase levels</b>	Anti-HAV IgM + <b>or</b> HAV RNA positive <b>or</b> HAV in feces	Probable: Case with typical clinical picture <b>and</b> epidemic link  Confirmed: Probable Case with typical clinical picture <b>and</b> lab confirmed
<b>Acute HBV</b>		Anti-HBc IgM + <b>or</b> HBV DNA positive	Probable: HBsAG + Case with typical clinical picture of acute VH  Confirmed: Case is lab confirmed
<b>Acute HCV</b>		Anti-HCV + <b>or</b> HCV RNA in clinical specimen	Confirmed: Lab confirmed clinical case
<b>Acute HDV</b>		anti - HDV IgM/ IgG+ HBsAg+ HDAg in clinical samples HD NA in clinical sample	Probable: Case with typical clinical picture of acute VH, HBsAg+ , with complications  Confirmed: Case with typical clinical picture <b>and</b> lab confirmed
<b>Acute VH unspecified</b>		negative for specific serology of HAV,HBV,HCV,HDV,HEV Negative for NA of HAV,HBV,HCV,HDV,HEV	Probable: Case with typical clinical picture of acute VH  Confirmed: Case with typical clinical picture <b>which is not</b> confirmed through lab tests

# Case definitions for chronic viral hepatitis

Clinical Criteria	Laboratory criteria	Case Classification
<p>Chronic HBV</p> <p>Clinical picture typical for chronic hepatitis and lab evidences</p>	<p>HBsAg+ for period &gt; 6 mos</p> <p>HBV DNA+ for period &gt; 6 mos</p>	<p>Probable: Case with typical clinical picture of <b>chronic VH</b></p> <p>Confirmed: Probable Case with typical clinical picture of <b>chronic VH</b> and lab confirmed</p>
<p>Chronic HCV</p> <p>Clinical picture typical for chronic hepatitis and lab evidences</p>	<p>Anti-HCV + for years</p> <p>HCV RNA + for years</p>	<p>Confirmed: Lab confirmed clinical case, typical for chronic hepatitis</p>
<p>Chronic HDV</p> <p>Clinical picture typical for chronic hepatitis and lab evidences</p>	<p>HBsAg+</p> <p>Anti HDV</p>	<p>Probable: HBsAg + Case with typical clinical picture of <b>chronic VH</b> with complications</p> <p>Confirmed: Case with typical clinical picture for chronic hepatitis and lab confirmed</p>

# Surveillance of Viral Hepatitis (VH)



National level	NCHI	NCIPD
Responsibilities	<i>Computerized data processing</i>	<i>Data analysis and interpretation Exchange of surveillance data Investigation of large-scale outbreaks and epidemics ; Feedback</i>
Timing	<i>Daily, Weekly, Monthly, Annually</i>	<i>Weekly, Annually</i>
Means of communication	<i>Mail</i>	<i>WEB bulletin</i>
Reporting form	<i>Tabular</i>	<i>Annual CD Report</i>
Institute receiving reports	<i>MoH, NCIPD, RHI</i>	National: MoH, RHI; International: WHO; ECDC

**SECOND LEVEL - INTERMEDIATE** *Regional Health Inspectorate (RHI)*  
**Responsibilities** - *collect reports, send aggregated data of suspected/ confirmed cases to National centre for health information (NCHI)  
 Epidemiological investigation of cases/contacts and outbreaks*  
**Timing**- *Daily, Monthly, Annually*  
**Means of communication**- *Fax, mail, e-mail*  
**Reporting form** - *Case investigation form ; Tabular, CD Report form;*  
**Institute receiving reports** - *NCHI, MoH (reports for outbreaks),*

**FIRST LEVEL – NOTIFIER: HEALTH CENTERS, GPS, HOSPITALS,**  
**Responsibilities** - *identify cases, complete and send reporting form*  
**Timing** - *Within 24 hours*  
**Means of communication** - *Mail, telephone, e-mail, fax*  
**Reporting form** - *Rapid notification form*  
**Institute receiving reports**- *RHI*

# Sources of epidemiologic information for viral hepatitis

## Surveillance - *basic method in use in Bulgaria*

Reflects recent exposures

- **cases**- epidemiological investigation
- **contacts** -epidemiological investigation, medical observation incl. urine or blood lab tests ;

**Seroprevalence data** (Exposures over lifetime; Demonstrates underlying pattern of immunity in population)

HAV

- studies not performed within last 2 decades → no data

HBV

- studies before introduction of vaccination programme
- studies related to specific risk groups / HCWs
- studies of nosocomial outbreaks

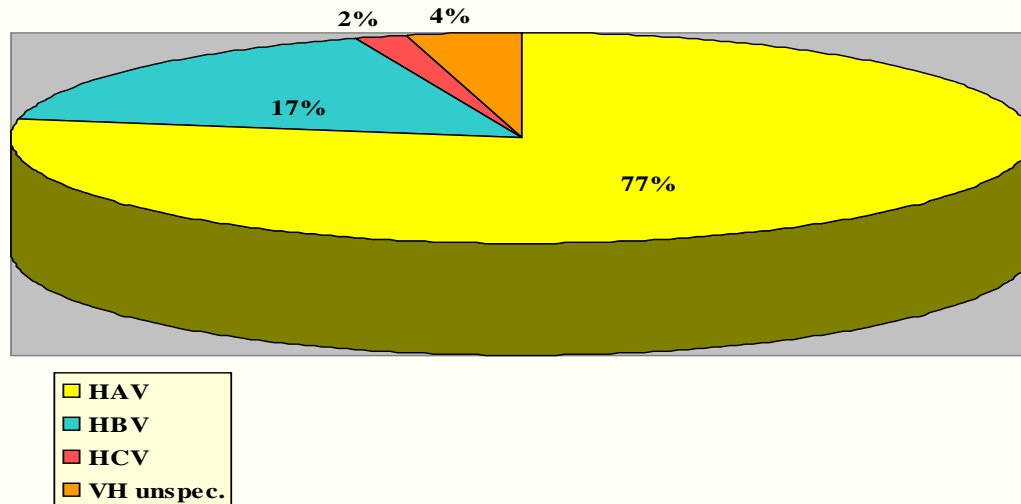
HCV

- studies of nosocomial outbreaks
- related to specific risk groups / HCWs

# Endemicity of Viral Hepatitis in Bulgaria

	Usual Age of Patients (years)	Reported Disease Incidence (per 100,000/year)	Transmission Patterns
Viral hepatitis A (HAV) Endemicity: <b>Intermediate</b>	4-24	12-150	person to person; food and waterborne; periodic epidemics
Viral hepatitis B (HBV) Endemicity: <b>Intermediate</b> HBsAg carriers- 2-7%	15-29	35 (in 1984) -5 (in 2010)	sexual horizontal nosocomial infections
Viral hepatitis C (HCV) Endemicity: <b>low</b> Anti-HCV prevalence 1,3%	20- 34	0,5 - 1,8	sexual nosocomial infections IDUs

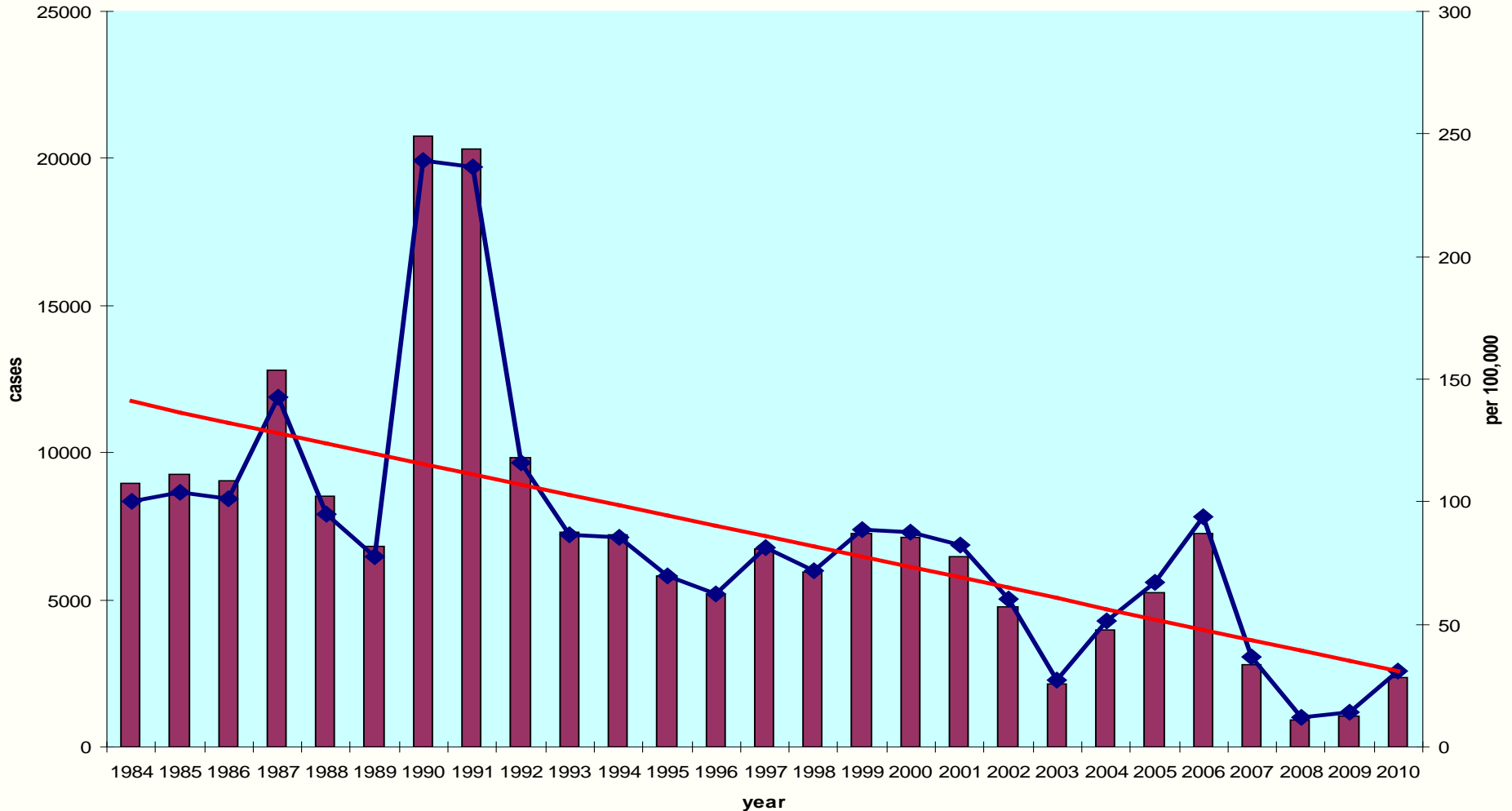
# Viral hepatitis - general information for 1998-2010



- HAV represents the largest proportion of acute VH ( average 77% for the period)
- Acute HBV - 17%
- Acute HCV -2%
- Acute HDV - 0,1% (2-8 cases per year)
- Death cases are mainly due to HBV( 9-20 cases per year)
- isolated death cases of HCV or HAV

# Acute Viral Hepatitis A

Annual incidence of Hepatitis A: 1984- 2010



# Epidemiology of HAV

- 1990-1991 is the largest epidemic in the country, presented with total of 41 060 registered cases of HAV ( IR 239 per 100,000 in 1990)
- Since this time a stable decrease of incidence is observed ( the lowest IR 11,88 per 100,000 is registered in 2008 = 908 cases of acute HAV)
- incidence by age:
  - the most affected are children of age 1-14 y
  - cohorts of susceptible older children, adolescents and adults
- HAV outbreaks in schools, orphanages , centers for socio-medical care for children
- Variability in incidence within regions : the level of endemicity increases from west to east
  - **anti-HAVt seroprevalence 68.33%**. Vatev, N. T., M. V. Atanasova, et al. (2009). "Seroprevalence of hepatitis A viral infection in Plovdiv, Bulgaria." Folia Med (Plovdiv) 51(1): 70-3
- outbreaks in some regions ( cities or villages) with large minority population of Roma people\*
- People/ families with low socioeconomic status
- Prevalence of urban vs. rural spread of cases
- Cyclic dynamics (within period of 2- 6 years) of epidemic spread of HAV at national level
- Seasonal dynamics autumn/ winter

In 2005: 31 HAV epidemic outbreaks ( > 600 cases) in 9 regions

Reasons: floods → change for worse of hygiene, living standards, drinking water supply, etc.

Transmission: person to person

Ineffective discovering of the sources

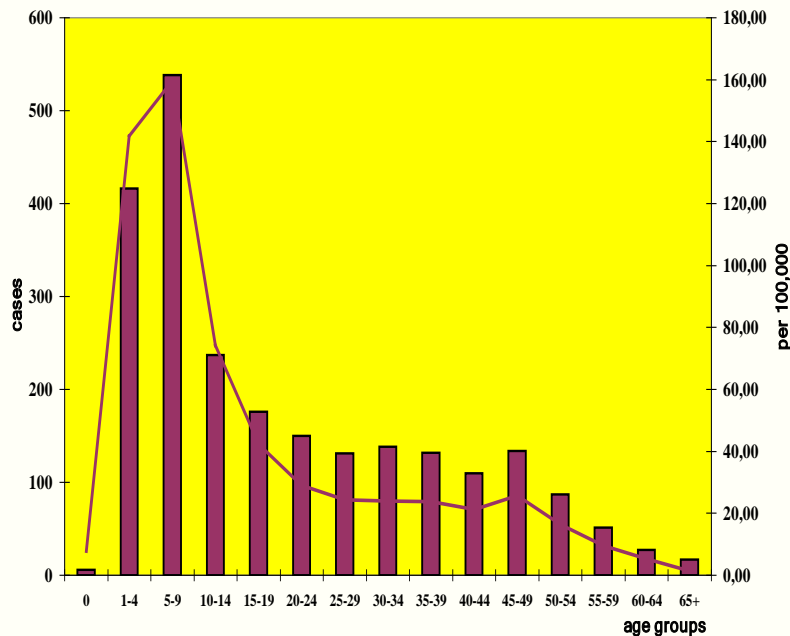
Contacts found and investigated

- 6 times more than cases;
- 20-25% of contacts developed HAV

- outbreaks in regions with large minority population of Roma people
- neighborhood in Plovdiv(2006):  
affected ages - children and adolescents

# Acute Viral hepatitis A, 2010

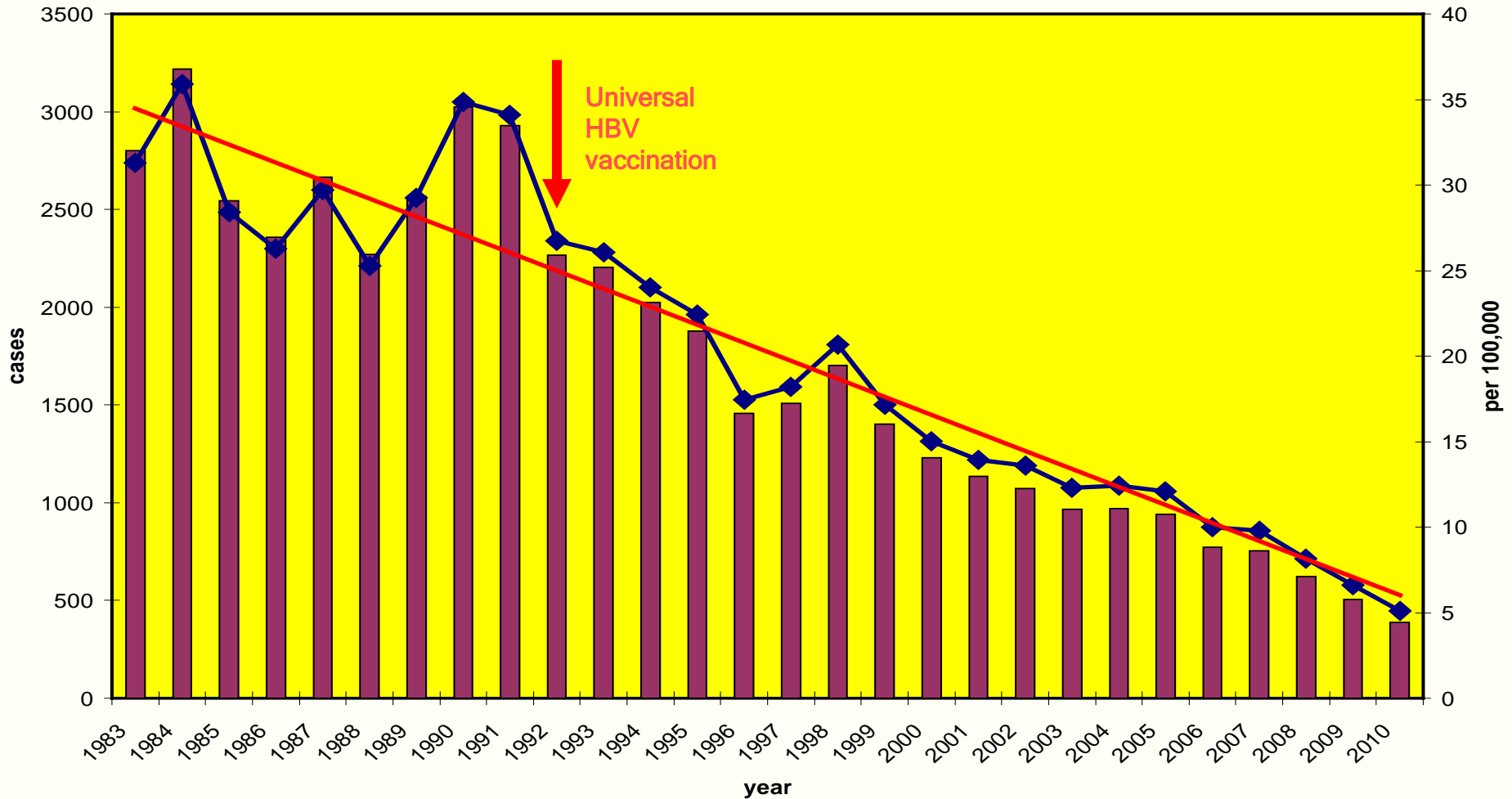
Acute Viral Hepatitis A in Bulgaria , 2010



- 2350 acute cases of VHA( 31,07 per 100,000)
- All cases are confirmed- anti HAV IgM positive
- Most affected age groups: 5-9 y( 538 cases;159,77 per 100,000); 1-4y ( 416 cases;141,74 per 100,000);
- Since September 2010, 6 regions( 4 in south-east part of the country+ 2 in the west) registered the new epidemic increase of VHA :
  - Kustendil region: 132 cases ( 90,67 per 100,000); 100 cases were registered in the Roma minority quarter( 833,33 per 100,000).All cases were hospitalised.
  - Plovdiv region: 283 cases( 168 cases in 4 Roma minority quarters and villages). Affected ages - mainly children.
  - Stara Zagora region: 540 cases (153,88 per 100,000; 47% of cases were children 1-14y of age;

# Acute Viral Hepatitis B

Acute viral hepatitis B: Annual incidence, 1983-2010



## Factors of influence on the current epidemiology of acute viral hepatitis B

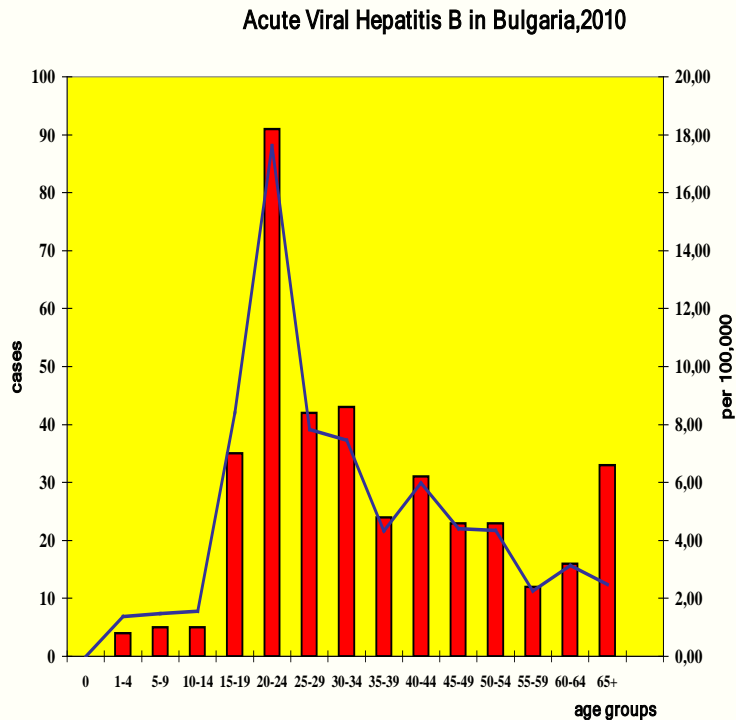
- 1992 - introduction of universal immunization of newborns
- 1992 - introduction of immunization of HCWs and medical students
- Improvement of specific lab diagnosis: quality and quantitative tests
- Screening of blood and blood products; donated tissues & organs
- Universal precautions applied in hospitals, BTC, labs, dentistry
- Use of disposable equipments (syringe+ needle and etc.)
- Training of medical personnel
- Introduction of medical standards

Additional contribution of:

- patient associations
  - pharmaceutical business
- } Informative campaigns & advertising activities

} Decrease of acute HBV incidence

# Steady decrease of HBV incidence in age groups subject to vaccination



year	1992	2010	
Age group	incidence per 100,000	incidence per 100,000	Change (%)
0-1	7,99	0	-100
1-3	23,80	1,36	-94
15-19	58,68	8,40	-86

# WHO JRF, Bulgaria 2010

## specific incidence acute viral hepatitis B, confirmed cases

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U\_VA\_com fx All cases of AVHB reported here as immunised(15 cases), received 3 doses of hep B vaccine. The age group 15-19y consists of two parts: children who have to be immunized obligatory( 15-18 y) plus cases of 19 years old ,which were not immunized ( by regulation in the country). Within the age group 15-19 y a total of 35 cases of AVHB were reported. Only 2 cases are under 19 y of age and are completely vaccinated with 3 doses Hep B vaccine. 2 cases are 18 y of age and do not have a proof for immunization. The rest of 31cases are nonimmunised.

**1B. Disease incidence by vaccination status and age groups**

Disease	Vaccination status	Age Group (Years)							Comments	
		<1	1 - 4	5 - 9	10 - 14	15 - 19	20 - 29	>30		unknown
Mumps	0 doses									
	1 dose									
	2 doses									
	Unknown									
Rubella	Not immunized									
	Immunized									
	Status Unknown									
HepB (Acute)	0 doses	0	0	0	0	31	133	205	0	on in the country). Within the ac
	1 dose	0	0	0	0	0	0	0	0	
	2 doses	0	4	5	4	2	0	0	0	
	Unknown	0	0	0	1	2	0	0	0	
Pertussis	0 doses									
	1 dose									
	2 doses									
	3+ doses									
Total Hib disease (meningitis and others)	Unknown									
	0 doses									
	1 dose									
	2 doses									
Meningitis C	3+ doses									
	Unknown									
	0 doses									
	1 dose									
	2 doses									
	3 doses									
	Unknown									

1B. Specific incidence / 2. Schedule-Source / 3.School\_and\_Add\_Imm\_delivery\_ / 4A. Routine Coverage / 4B. Coverage Surveys / 4C. Subnational Coverage / 5. Official Estimates / 6A.

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# Epidemiological investigation form of acute VHB case

126 (77)

МЗ  
Регионална инспекция за опазване  
и контрол на общественото здраве  
Гр. Пловдив

КАРТА  
ЗА ЕПИДЕМИОЛОГИЧНО ПРОУЧВАНЕ  
НА ЗАРАЗНО БОЛЕМ

№ 95 X 2010 G

УТОЧНЕНА ДИАГНОЗА: Вирусен хепатит тип В

Име: Таня Николаевна Танчева Пол: Ж Възраст: 18.8.11 мес.

Гр./село: Пловдив ул. №: 13 кв.: 1

Къде работи, учи: ДМД "Св. Георги" с.с. Раковски Б.

адрес: 1. ДМД "Св. Георги" с.с. Раковски Б. гр. Пловдив

Професия: професионална

Заразен в гр./село: 1. работно

Заболел в гр./село: 1. работно

Презледан за 1-ви път по повод заболяването: 1. работно

Извънначална диагноза: Вирусна хепатита микробен

Диагноза потвърдена: 1. общо

Болезиня открита: 1. работно

Изолиран /хоспитализиран в: МЗБАН "Св. Георги" Пловдив

Имунизиран срещу заболяването: 1. да 2. не

Важни данни за заболяването и епид. проучване:

А	заболел на	диагноза	позволен	по 1-ви път	показатели:
	21.09.2010	21.09.2010	В.А.	Е-5	29-30
	21.09.2010	21.09.2010	Г.А.	31-32	33-34
	25.09.2010	25.09.2010	Д.А.	37-38	39-40

Изолиран /хоспитализиран в: МЗБАН "Св. Георги" Пловдив

Вероятен източник на заразяване: майка - HBsAg (+) pos (професионална)

Фактори, участвували в механизма на предаване: общ брой 51 от тях заболели

Контактни лица: в дома 48 в колектива 48

Вид на околното: общ хиг. оценка за околното: 51

Проверена дезинфекция: 1. да 2. не

Установени пропуски спрямо: 1. общо 2. контактни 3. контакти 4. контакти

Епидемиологично проучване е извършено от: 1. епидемиолог 2. санитарен лекар 3. лаборант

Собствено, бащино и фамилично име на контактните лица	Възраст	Професия	Адрес	Резултат от изследване	Профилактика (вак.)	Изход (самоизл.) или не
1. <u>Мирюслав Танчев</u>	<u>18.8.11</u>	<u>д-р</u>	<u>постоянна в ДМД "Св. Георги"</u>	<u>HBsAg (+) pos</u>		
2. <u>Николина Танчева</u>	<u>18.8.11</u>	<u>бизнес жена</u>	<u>постоянна в ДМД "Св. Георги"</u>	<u>HBsAg (+) pos</u>		
3. <u>Таня Николаевна Танчева</u>	<u>18.8.11</u>	<u>професионална</u>	<u>постоянна в ДМД "Св. Георги"</u>	<u>HBsAg (+) pos</u>		

Допълнителни данни от епидемиологичното проучване:

Девето е било хоспитализирано в селскостопанска къща на МЗБАН "Св. Георги" в Пловдив и е предала микробен вирус на 21.09.2010 г. на работно място в с.с. Раковски Б. Девето е работила в ДМД "Св. Георги" ул. № 13 кв. 1 на 25.09.2010 г. HBsAg (+) pos откриване е на 05.10.2010 г. Девето е при професията на HB ваксинацията; I 28.02.2009 г. II 25.03.2009 г. III 25.08.2009 г. Матрицата е извадена от HBsAg (+) pos и изследвана на различни работни места - над Б. Д. Д. на 21.09.2010 г. HBsAg (+) pos; Anti-HBc IgG (+) pos HBsAg (+) pos.

Дата на започване на проучването: 21.09.2010

Дата на завършване на проучването: 10.12.2010

Извършил проучването: Д-р А. Велков

МЗБАН "Св. Георги" Пловдив

## Acute VHB in children, 2008-2010

### Presentation by age and according to patients' vaccination status

age	<1y			1-4y			5-9y			10-14y			15-19y		
	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
0d	0	0	0	0	0	0	0	2	0	0	4	0	0	83	31
1d	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2d	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3d	1	0	0	6	1	4	3	4	5	1	3	4	2	2	2
Unknown	0	0	0	0	0	0	0	1	0	7	3	1	98	0	2
<b>Total cases</b>	3	0	0	6	1	4	3	7	5	8	10	5	100	85	35

Total number of cases: 272

**114** / 272 not vaccinated - born before introduction of universal immunization

**38** / 158 completely immunized ( 24%)

## Chronic hepatitis B

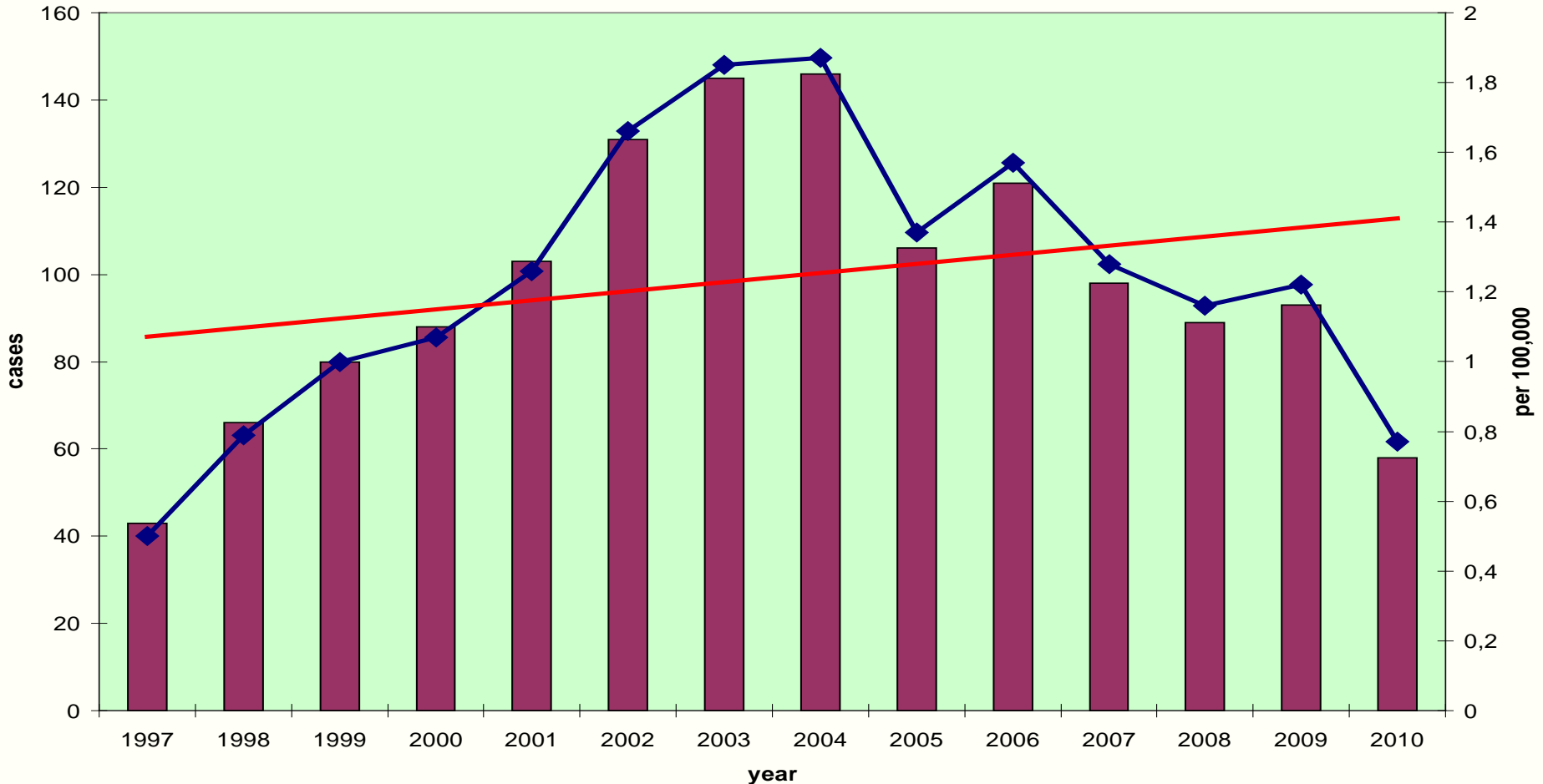
year	2006	2007	2008	2009	2010	For the period
cases	16	8	3	100	81 22F 59M	208

HBsAg carrier state ( no clinical symptoms )– new registered cases annually

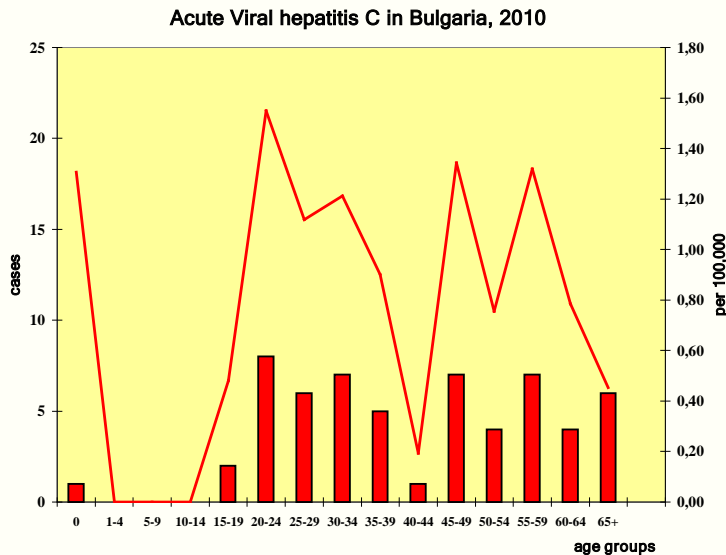
year	2006	2007	2008	2009	2010	For the period
cases	2346	215	122	3176	2666 760F 1906M	8525

# Acute Viral Hepatitis C

Viral hepatitis C: Annual incidence, 1997-2010



# Acute HCV, 2010



- 21/28 regions reported acute HCV in 2010 with total of 58 cases;
- Affected risk groups:
  - 11/58 are IDUs
  - 1/58 is HCW
  - 1/58 haemodialysed patient
  - 4/58 with multiple medical and dental interventions
  - 29% of patients belong to high risk groups for blood-borne diseases
- possible source of infection /mode of transmission is unknown for 71% of cases

## Chronic hepatitis C

year	2006	2007	2008	2009	2010	For the period
cases	22	8	8	113	108*	259
Sex			3F 5M	49F 64M	41F 67M	

\* Source: regional reports and NCHI annual aggregated data report. Official registration data was collected from 15 regions as a result of regular screening of blood donors and screening in Haemodialysis units.

## Nosocomial HCV outbreaks

HCV outbreaks				
year	region	Hospital ward	cases	Possible cause
2001*	Stara Zagora	Internal	31	<ul style="list-style-type: none"> <li>•patient-to-patient transmission attributed to unsafe injection practices</li> <li>•Failure in organization and implementation of infection control measures</li> </ul>
2002	Silistra	Internal	7	
2009	Lovech	GE Pulmology	18	
2009	Sofia oblast	hemodialysis	6	

•Viral hepatitis in: Acute infectious diseases in Bulgaria 2001, N.Gatcheva,M. Kojouharova, N. Vladimirova et al, NCIPD Information journal,5,2002

•Outbreak of nosocomial hepatitis B and hepatitis C in a hemodialysis unit, N. Vladimirova, Nosocomial infections,vol 6, No1-2,2009,78-85

# Prevalence of HCV among risk groups and medical personnel

population	year	Nr screened	Anti-HCV+	author
Blood donors	1995-1997	67053	1,3%	B. Iliev et al <sup>1</sup>
hemodialysis	1993-2006	161	45,3%	O.Boykinova et al, <sup>2</sup>
hemophiliacs		120	96,6%	
IDUs		230	70%	
hemodialysis	2008	80	40%	Y.Stoilova et al <sup>3</sup>
Medical staff (hemodialysis unit)	1993-2008	31	12%	Y.Stoilova et al <sup>3</sup>
Medical staff	2007-2008	324	0%	N.Gatcheva et al <sup>4</sup>

Source: 1. The carrier state prevalence of hepatitis B and C markers in blood donors in population of some regions in Bulgaria, B. Iliev et al , Infectology, XXXVII,2,2000,10-11

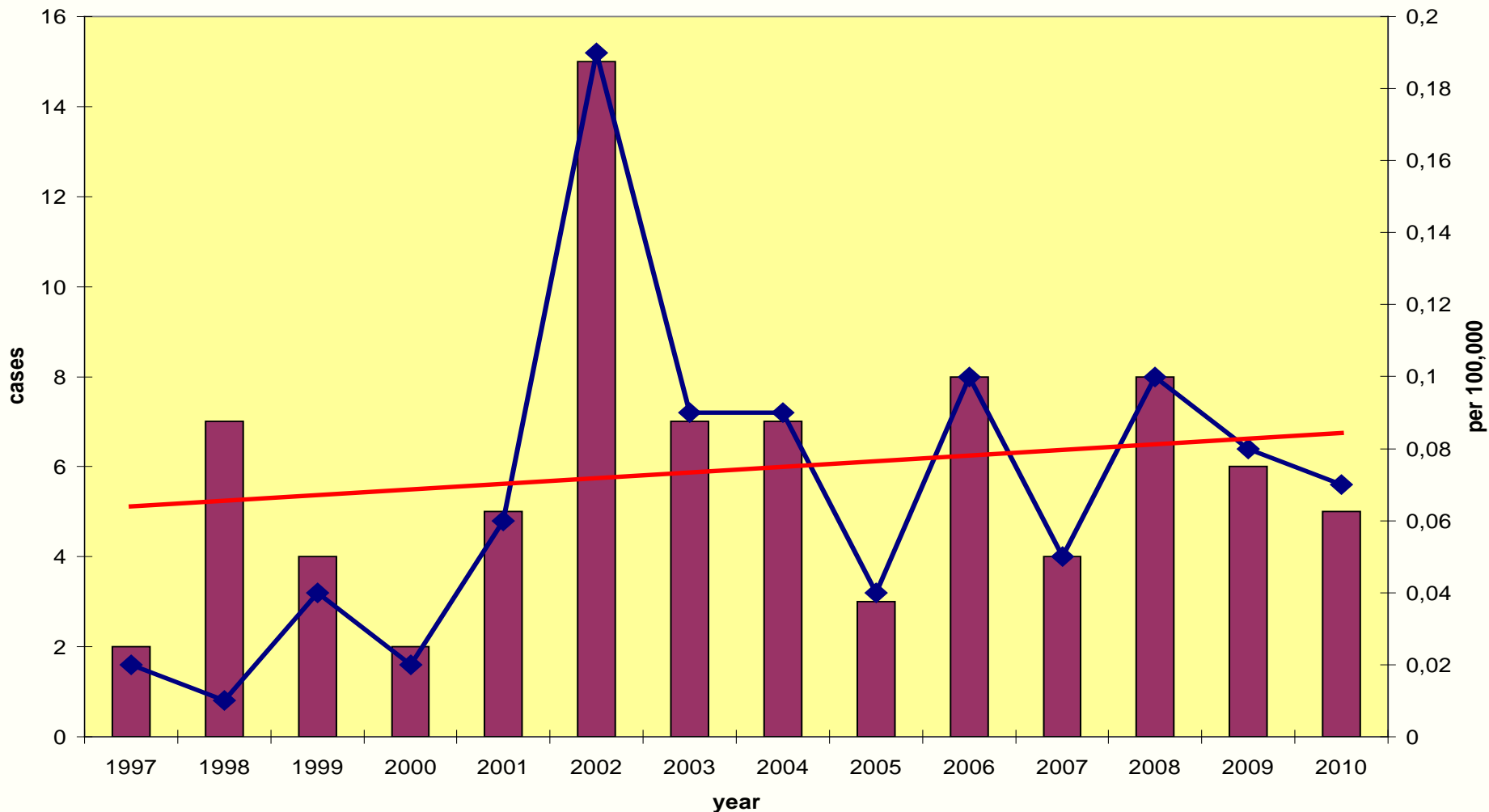
2.Prevalence and clinical forms of HCV infection among risk groups. O.Boykinova et al, Infectology,XLV,3,2008,30-32

3. Hepatitis C virus infection in healthcare settings, Y.Stoilova et al, Nosocomial infections, vol 5, No1-2, 2008,63-68

4.Prevalence of HBV and HCV infection among medical personnel in Bulgaria:results of a multi-centre serosurvey, 2007-2008, N.Gatcheva et al, Nosocomial infections, vol 5, No1-2, 2008,69-74

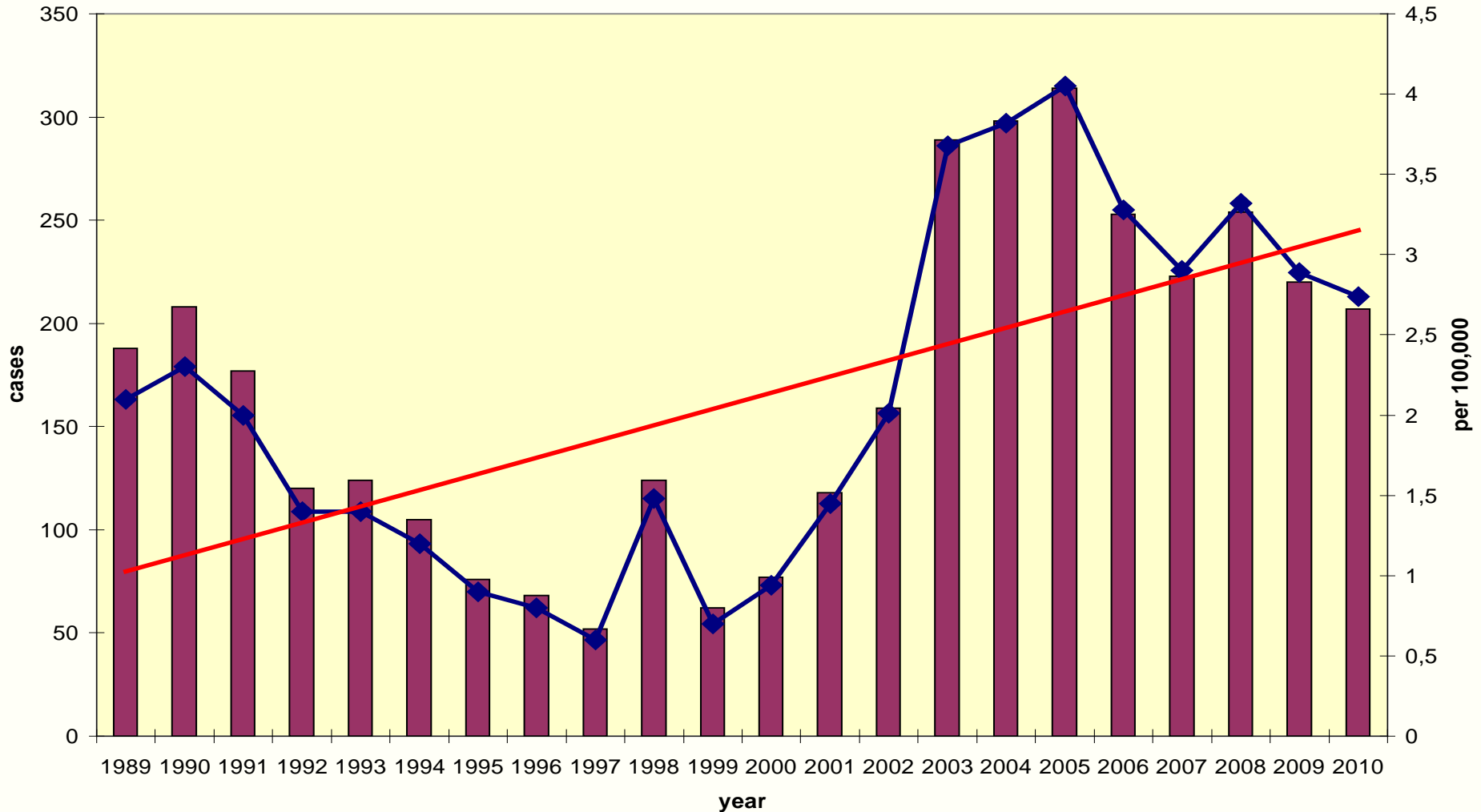
# Acute Viral Hepatitis D

Acute Viral hepatitis D: Annual incidence, 1997 - 2010

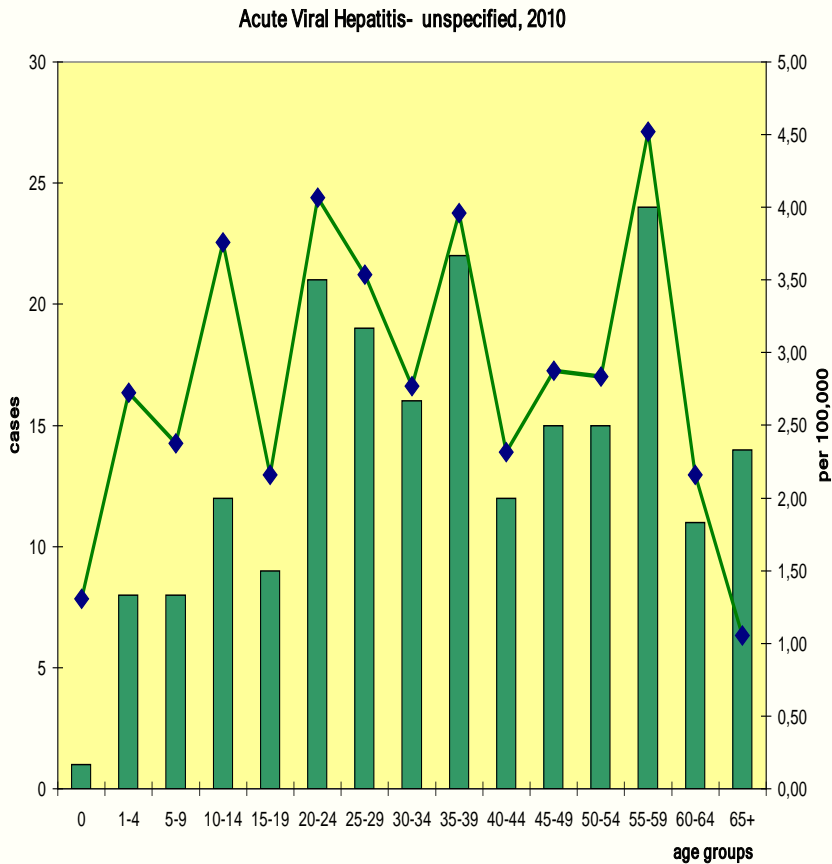


# Acute Viral hepatitis Unspecified

Acute Viral hepatitis unspecified: Annual incidence, 1989 - 2010



# Acute Viral hepatitis Unspecified



- 207 cases( 2,74 per 100,000)
- All age groups are affected
- All cases are tested with negative results for anti- HAV, HBsAg, anti-HCV
- 3 death cases (0,04 per 100,000)

Example: Epidemiological data for 15 cases ( 5,16 per 100,000) from the region of Pleven:

- 5women; 10 men ( 1:2)
- 6 with history for surgical interventions( incl.1renal transplantation)
- 2 with history of dental treatment
- 7 with negative information about possible risk factors