

**Prevention and control of Viral Hepatitis
in Latin America and Brazil,
lessons learnt and the way forward**
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**Brazilian Ministry of Health, Brazilian Society of Hepatology
PAHO, Viral Hepatitis Prevention Board**

PART III Prevention and control of Viral Hepatitis in Brazil

SESSION 9 HEPATITIS IN SPECIAL RISK GROUPS/ REGIONS IN BRAZIL

HIV and HBV/HCV co-infection

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HIV and HBV/HCV co-infection

Viral hepatitis: important health problem worldwide
It is well known: co-infection by HIV and HBV or HCV can modify the outcomes of such infections

higher likelihood of chronic liver disease & greater risk of rapid evolution to liver fibrosis

HAART for HIV/AIDS treatment: increase the life expectancy of HIV-infected patients
Chronic liver disease became a common finding and a leading cause of death among coinfecting patients

Soriano V et al.: *Enferm Infecc Microbiol Clin.* 2011; 9:691–701

Buskin SE et al.: *World J Gastroenterol* 2011; 17:1807-16

Puoti M et al.: *J Int Assoc Phys AIDS Care* 2009; 8:3042

Co-infection of HBV or HCV and HIV: an exploratory study in the State of São Paulo, Brasil, 2007 a 2010

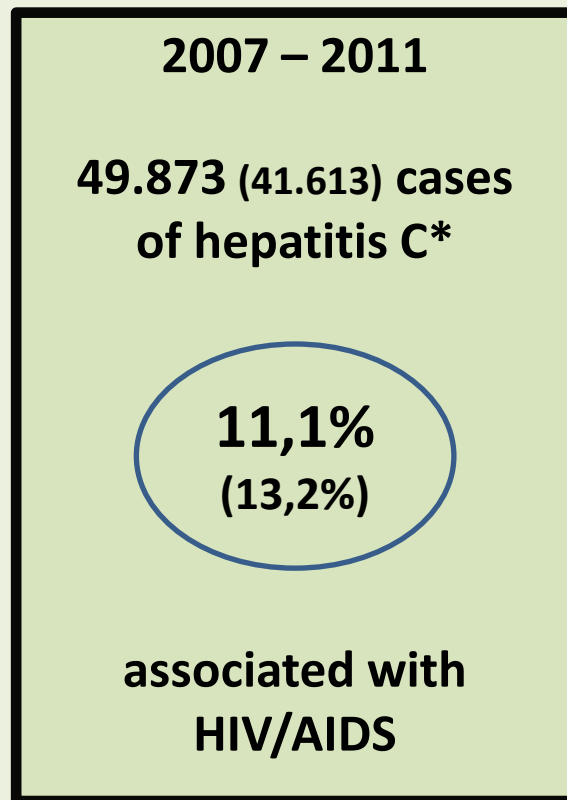
46.969 reported cases of viral hepatitis:

- **Co-infection HIV/HBV: 1.318 cases – 2,8%**
- **Co-infection HIV/HCV: 3.032 cases – 6,45%**
- **HIV/HBV/HCV: 201 cases – 0,43%**
- **Prevalent risk factors: sexual contact with carriers (HIV/HBV); use of illicit drugs (HIV/HCV)**

Confirmed cases of hepatitis C* (number and percentage) associated with HIV/AIDS Brasil 2007-2011

HIV/Aids	Total (2007-2011)	
	nº	%
Sim	5513	11,1
Não	36100	72,4
Ignorado	8260	16,6
Total^{co}	49873	100,0

*anti-HCV and HCV-RNA (+)



Confirmed cases of hepatitis C associated with HIV/AIDS Brasil 2007-2011

2010 data*:

- **HCV genotypes:** gen 1 (67,7%), gen 3 (25,9%) and gen 2 (5,7%)
- **Age:** 40-44 years group, followed by the 45-49 years (younger than the age groups globally notified for hepatitis C)
- **Sources of HCV acquisition:** drug use (27,4%), transfusion (26,9%), sexual contact (18,5%), accidents at work (1,2%), household contact (1,1%), hemodialysis (0,9%), vertical transmission (0,3%), and other (23,7%)

*when available information

Genotypic distribution of hepatitis C among hepatitis C and HIV co-infected patients in Brazil

HCV genotype	No.	%
1	68	68.7
2	4	4.0
3	26	26.3
4	1	1.0

Variables	Genotype 1 No. (%)	Genotype 3 No. (%)	RR	95% CI	P*
Sexual orientation					
Heterosexual	56 (74.7)	19 (25.3)			0.4
Homosexual	1 (50)	1 (50)			
Bisexual	2 (50)	2 (50)			
Intercourse with sex professionals					
Yes	28 (63.6)	16 (36.4)	0.76	0.58–0.99	0.04
No	31 (83.8)	6 (16.2)			

In conclusion: exposure to multiple risk factors associated with HCV transmission was common among HIV co-infected patients and an association between HCV genotype 3 and intravenous drug user was observed

Prevalence of HIV/HCV co-infection in Brazil and associated factors: a review

- **HCV and HIV share the same transmission routes, and co-infection is an unfavorable condition for the natural history of both viral diseases**
- **The knowledge of the extent of co-infection and associated risk factors is a vital tool for both prevention and control**
- **Aim: to review the literature examining the prevalence of HIV/HCV co-infection reported in studies conducted in Brazil, and identify the main risk factors associated with co-infection** (electronic search: Medline, Lilacs and SciELO databases)

Prevalence of HIV/HCV co-infection in Brazil and associated factors: a review

- **376 articles, 69 were selected for data extraction, 40 were reviewed: 36 cross-sectional, 3 cohort, 1 descriptive studies (48,791 subjects)**
- **Majority was male (71%) and young adults - mean age of 26,7 years**
- **Prevalence of HCV in individuals living with HIV: 20,3% in average; range: from 3,3% (serum samples) to 82,4% (drug users)**
- **Prevalence of HIV/HCV co-infection: highly variable, depending on the characteristics of the study population**
- **Risk factors associated with HIV/HCV co-infection : injection drug use and blood transfusion**

Prevalence of HIV/HCV co-infection in Brazil and associated factors: a review

- 20 studies (13,894 subjects): prevalence of HCV co-infection among individuals living with HIV
- Average rate: **19,5%** (range: 3,3% to 54,7%)
- Higher than the rate of 11,8% by the Ministry of Health (Epidemiological Bulletin of Viral Hepatitis 2011)
- Reason: MH estimative based on HIV/AIDS reported cases, and may not be representative of the general population

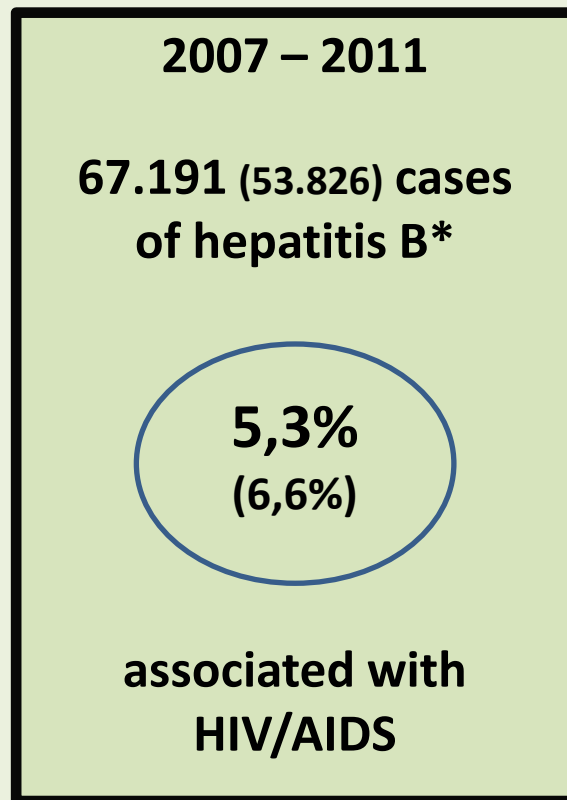
HCV/HIV coinfection

40 studies: **20,3%** 20 studies: **19,5%**

Confirmed cases of hepatitis B* (number and percentage) associated with HIV/AIDS Brasil 2007-2011

HIV/Aids	Total (2007-2011)	
	nº	%
Sim	3584	5,3
Não	50242	74,8
Ignorado	13365	19,9
Total^{co}	67191	100,0

*at least one (+): HBsAG, anti-HBc IgM, HBeAg



Confirmed cases of hepatitis B associated with HIV/AIDS Brasil 2007-2011

2010 data*:

- **HBV genotypes:** test not routinely available
- **Age:** highest rates 40-44 years and 35-39 years
- **Sources of HBV acquisition:** sexual contact (52.9%), household contact (9.1%), vertical transmission (5.9%), blood transfusion (5.5%), drug use (4.3%), hemodialysis (0.7%), accidents at work (0.6%) and other (20.9%)

*when available information

Hepatitis B genotype G and high frequency of LMV-R mutations among HIV/HBV co-infected patients in Brazil

AIDS Outpatient Clinic - HC-FMUSP: 2,412 HIV patients

- **HBsAg-reactive: 4.9%**
- **22/59 patients (37.3%): positive viremia (HBV-DNA)**
- **16/22: HBV genotyping:**
 - A: 12 (75%)**
 - G: two (12,5%)**
 - D: one (6.25%)**
 - F: one (6.25%)**

HBV in HIV population in Brazil: survey in Mato Grosso

comparative analysis with other regions of Brazil

Prevalence of HBV infection in HIV-positive populations reported in different Brazilian studies

Region (Main city)	n	Anti-HBc +ve	HBsAg +ve	IV drugs	Year
North (Belém)	406	51.0% (46.0–56.0)	7.9% (5.5–11.1)	10.6% (7.9–14.1)	2000
Central (Cuiabá)	1,000	40.0% (37.0–43.1)	3.7% (2.7–5.1)	2.4% (1.6–3.6)	2004
Southeast (Campinas)	226	44.0% (37.5–50.7)	5.3% (2.9–9.3)	29.0% (23.3–35.5)	1995
" (Ribeirão Preto)	401	40.9% (36.1–45.9)	8.5% (6.0–11.8)	22.2% (18.3–26.6)	2002
" (São Paulo)	1,693	38.6% (36.3–41.0)	5.7% (4.7–6.9)	.	1996
South (Florianópolis)	93	71.2% (60.7–79.9)	24.3% (16.3–34.5)	36.5% (26.9–47.2)	1999

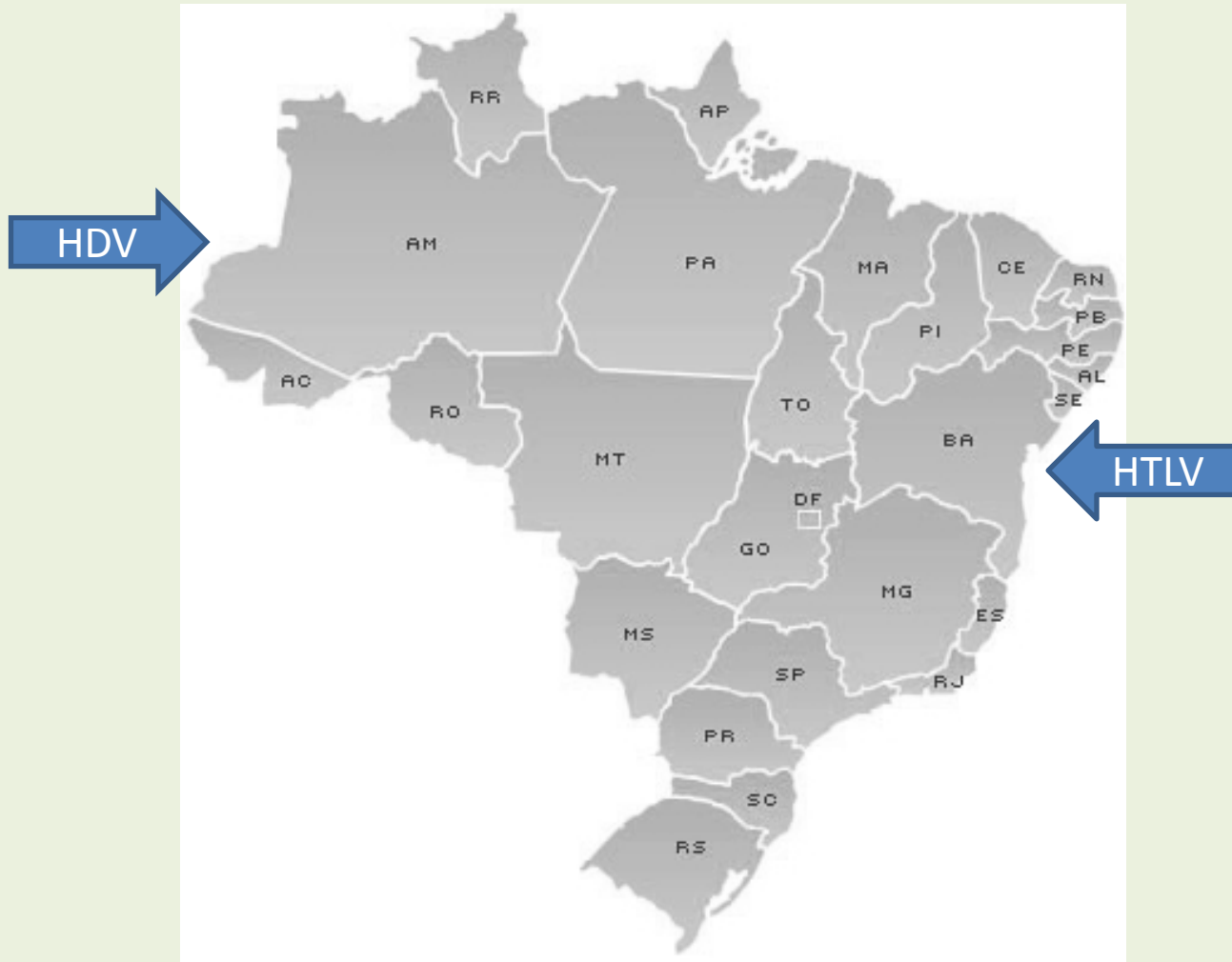
HBV in HIV population in Brazil: survey in Mato Grosso comparative analysis with other regions of Brazil

- **HBV infection prevalence: similar or slightly lower than that reported in other regions of Brazil**
- **In addition: less important role for drug injection in Mato Grosso compared to other regions of the country**
- **The high rate of nonvaccinated subjects among this HBV-unexposed/HIV-infected population is a matter of considerable health concern in this region**
- **Relationship between CD4 levels and HBV vaccine response: reinforces the need of keeping health care workers alert to this issue**

Thank you

Brazil: co-infections circumstances:

a) Western Amazon: hepatitis D b) Bahia: HTLV



Hepatitis delta in HIV/HBV co-infected patients in Brazil: is it important?

- **São Paulo Metropolitan Region: 3.259 HIV cases => HBsAg (+): 154 cases (4,7%); in 86/154: only one (1.2%) anti-HDV (+) (HBV-DNA not detected, but HDV-RNA detected)**

HIV/HBV co-infection: 4,7% HIV/HBV/HDV co-infection: 1,2%

- **Phylogenetic analyses: HDV genotype most closely related to HDV-1 sequences from Mediterranean European countries**
- **HDV infection is infrequent in the Southeast Region of Brazil; nevertheless HIV/HBV patients must be investigate for HDV infection (potential risk for HDV infection)**



Characteristics of co-infections by HCV and HBV among Brazilian patients infected by HIV-1 and/or HTLV-1

Salvador - Bahia

Markers	Group 1 (HIV+) n = 200, n (%)	Group 2 (HTLV+) n = 213, n (%)	Group 3 (HIV/HTLV+) n = 38, n (%)
HBsAg	1 (0.5)	5 (2.3)	8 (21.0)
Anti-HBC	43 (21.5)	40 (18.8)	18 (47.3)
Hepatitis B	44 (22.0)	41 (19.2)	25 (65.7) ^a
Hepatitis C	26 (13.0)	9 (4.2)	13 (34.2) ^a
Hepatitis B and C	11 (5.5)	3 (1.4)	9 (23.6) ^a

HCV and/or HBV infection: frequent among patients with retroviral infection. Risk factors & prevalence: distinct for each agent. Retroviral co-infection: increases the risk of AgHBs (+). HTLV-1 infection seems to increase the likelihood of HCV spontaneous clearance

Moreira M et al.: Braz. J Infect Dis 2013; 17:661-6