

IPFA 4th Asia Workshop on Plasma Quality and Supply

Epidemiology of blood-borne Infections in Vietnam

Nguyen Thị Lan Anh MD, PhD
Center for Bio-Medical Rsearch



National Institute of Hygiene and Epidemiology

Screening donated blood for infections:

WHO Recommendation, 2010

POLICY RECOMMENDATIONS

- 1 Each country should have a national policy on blood screening that defines national requirements for the screening of all whole blood and apheresis donations for transfusion-transmissible infections.
- 2 There should be a national programme for blood screening which sets out the strategy for screening, with algorithms that define the actual tests to be used in each screening facility.
- 3 All whole blood and apheresis donations should be screened for evidence of infection prior to the release of blood and blood components for clinical or manufacturing use.
- 4 Screening of all blood donations should be mandatory for the following infections and using the following markers:
 - HIV-1 and HIV-2: screening for either a combination of HIV antigen-antibody or HIV antibodies
 - Hepatitis B: screening for hepatitis B surface antigen (HBsAg)
 - Hepatitis C: screening for either a combination of HCV antigen-antibody or HCV antibodies
 - Syphilis (*Treponema pallidum*): screening for specific treponemal antibodies.
- 5 Screening of donations for other infections, such as those causing malaria, Chagas disease or HTLV, should be based on local epidemiological evidence.



Screening donated blood for infections:

Vietnam's Implementation

Circular 26/2013/TT-BYT, issued by MOH, 2013

- *Chapter III, Clause 14: Screening infections*

- Universal screening:

- HIV
 - HBV
 - HCV,
 - Syphilis

- Selective screening:

- Malaria: donated bloods from person returning from epidemic region
 - CMV: blood products being used for organ recipients

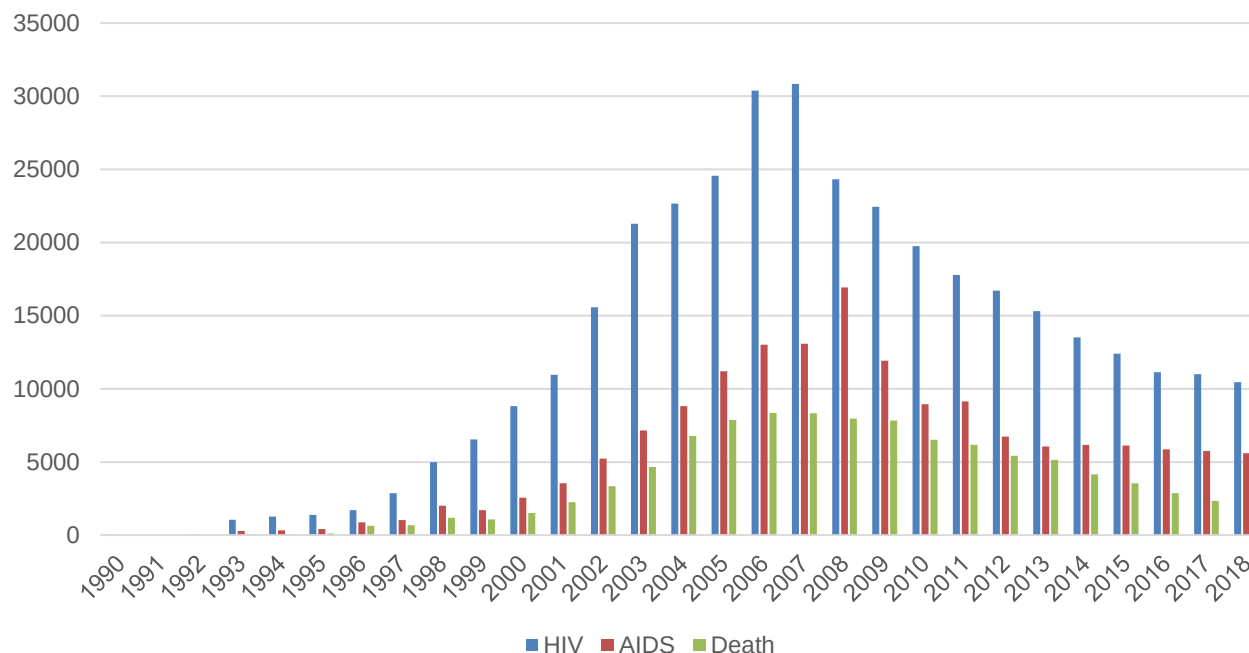


HIV surveillance system in Vietnam

- Currently, national surveillance on HIV epidemic and STIs, including syphilis, under coordination and implementation of Vietnam Administration for HIV/AIDS Control (VAAC), MOH
- Survey methodology
 - Reported case:
 - Clinical cases detected from clinics
 - Sentinel surveillance:
 - Populations: PWIDs, FSWs, MSMs, pregnant women, military recruits
 - Integrated Biological-Behavioral Survey (IBBS)
 - Key-populations: PWIDs, FSWs, MSMs



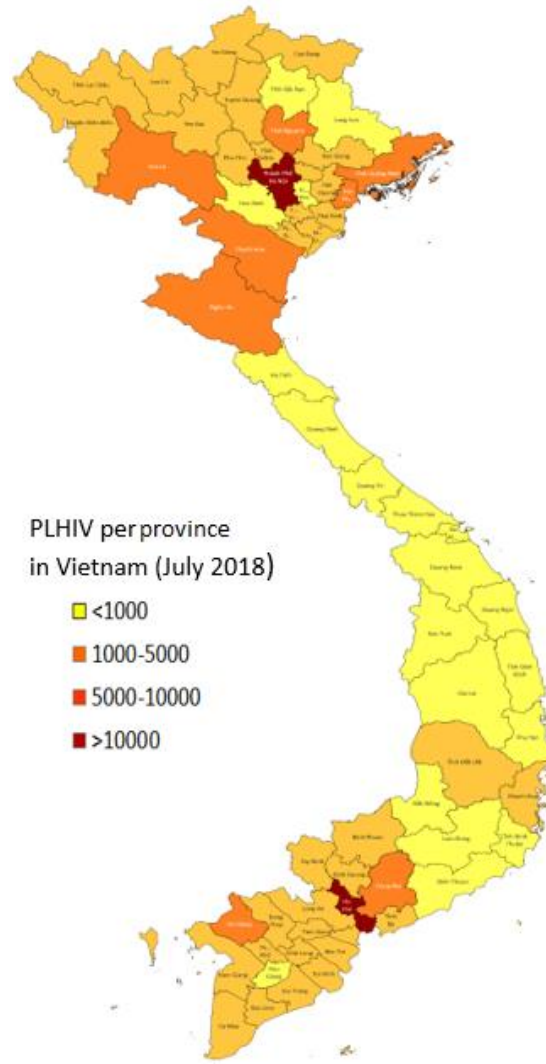
Annually Reported new HIV/AIDS diagnoses and deaths



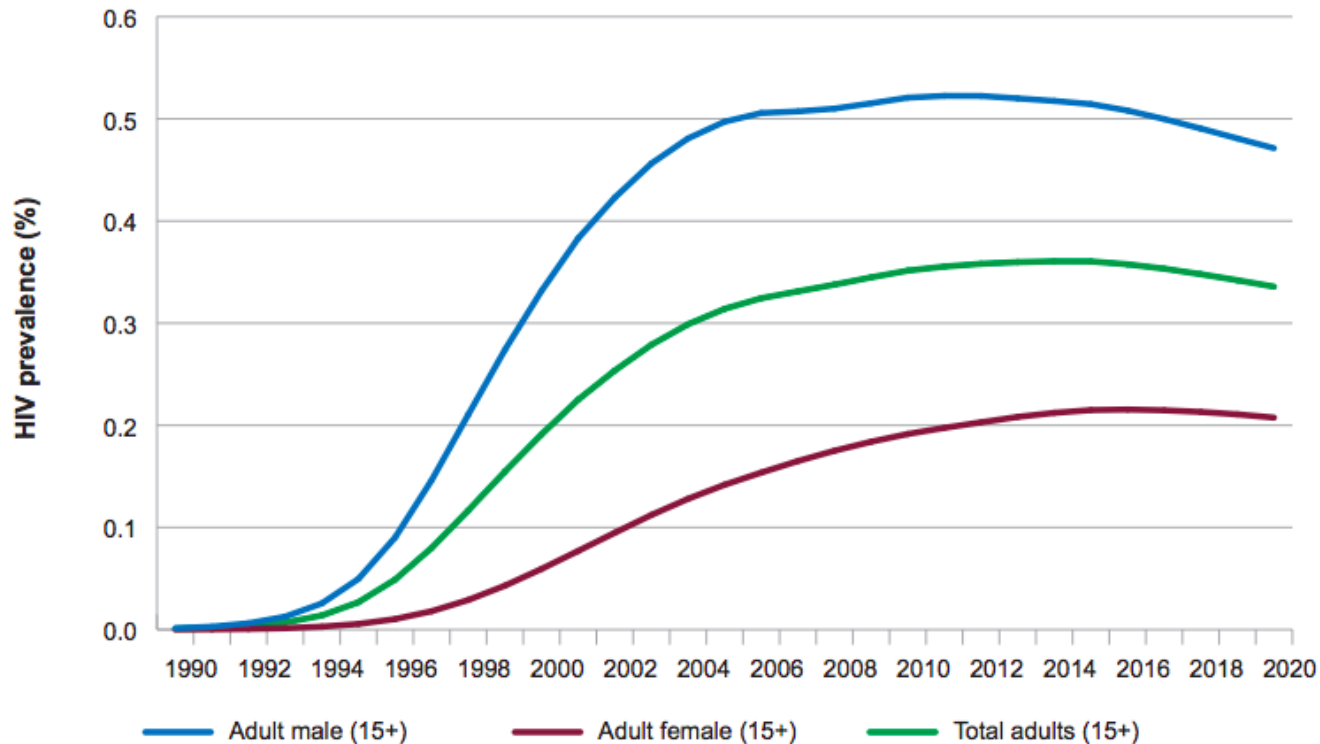
	2018	Accumulated to 2018
No. new HIV diagnoses	10.453	
No. people living with HIV (reported)	210.450	
No. people living with HIV (estimated)	250.000	
No. AIDS death	2.150	102.448



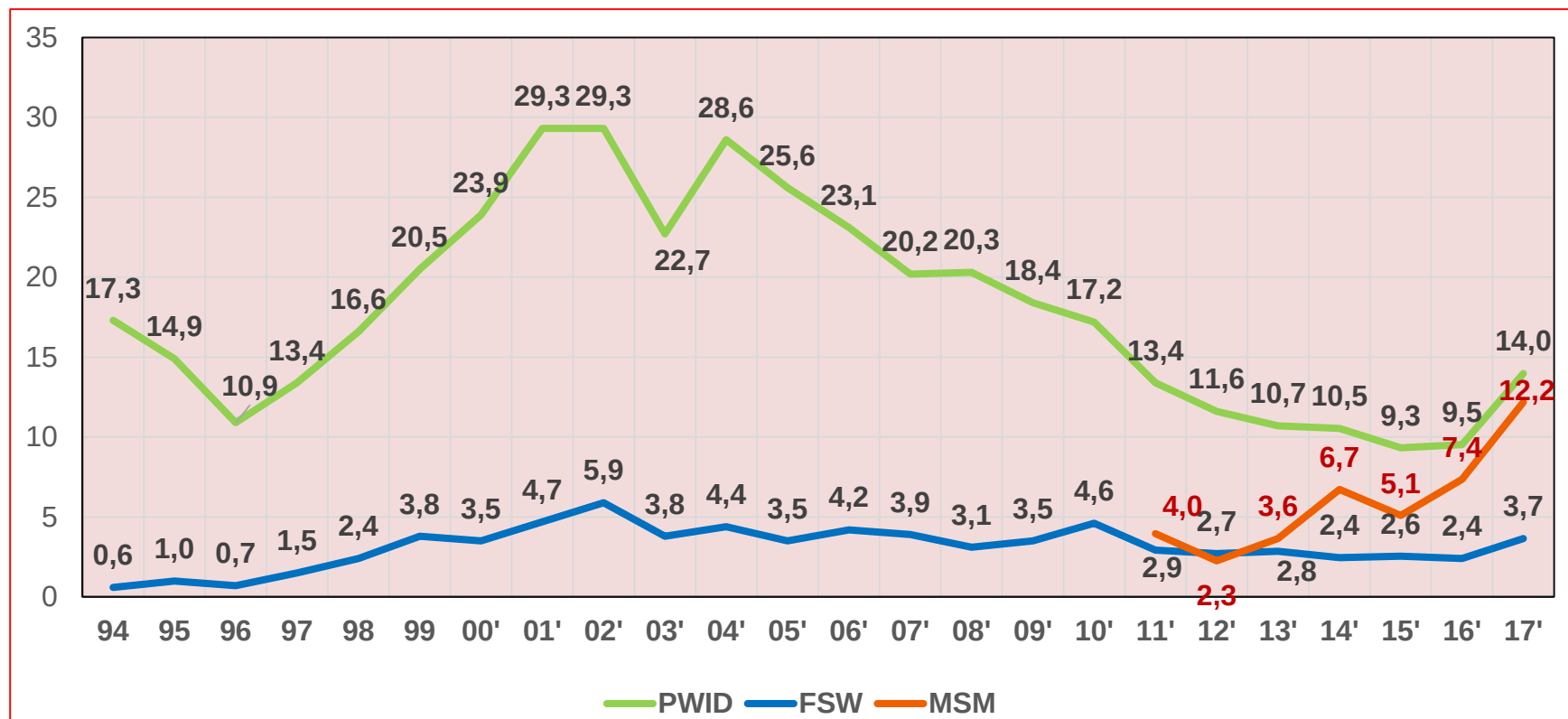
Geographic Concentration of the HIV Epidemic



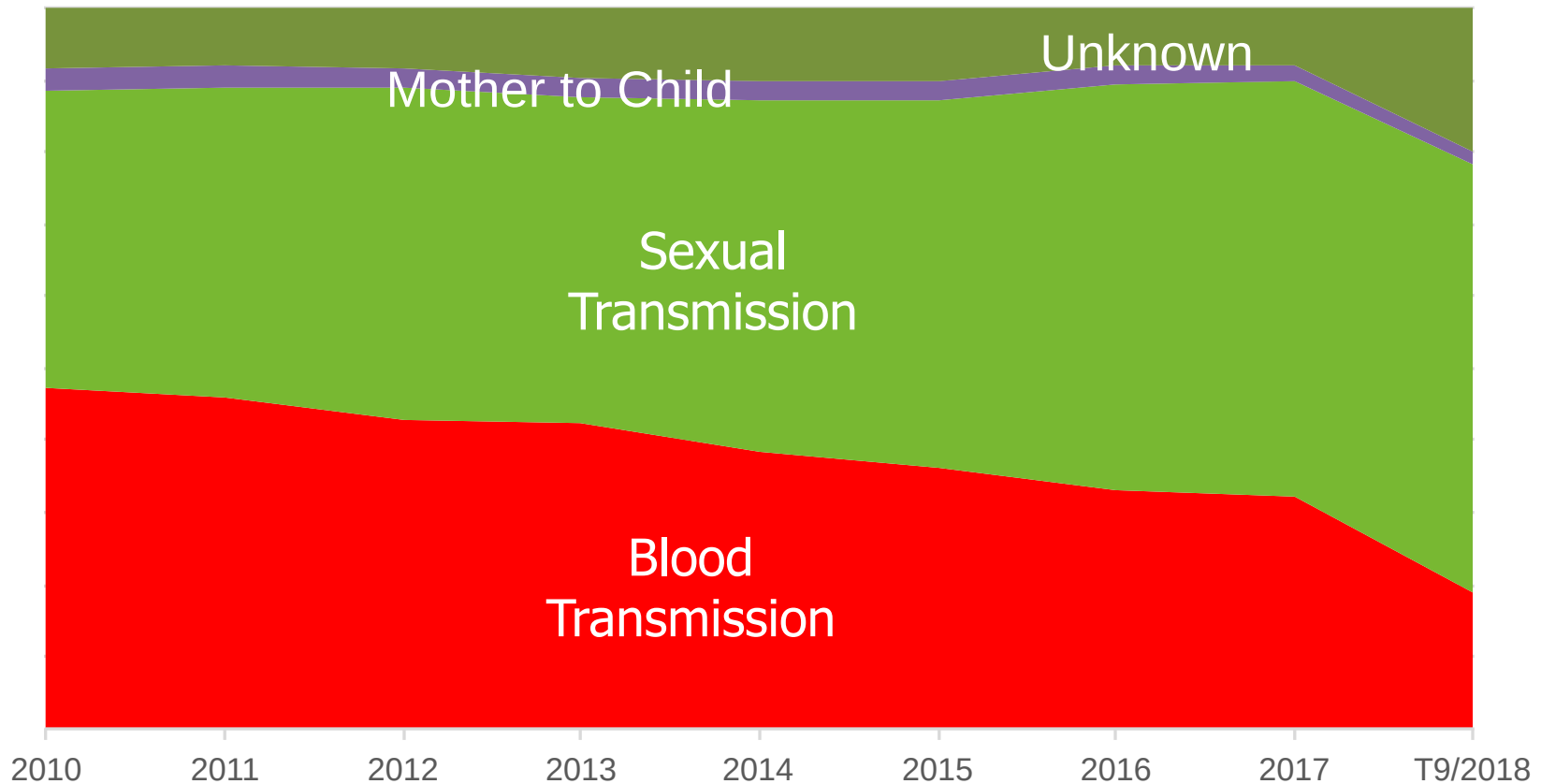
Estimated HIV Prevalence among Adult Population in Vietnam, 2005-2020



HIV prevalence in high-risk groups



HIV Infection by transmission route



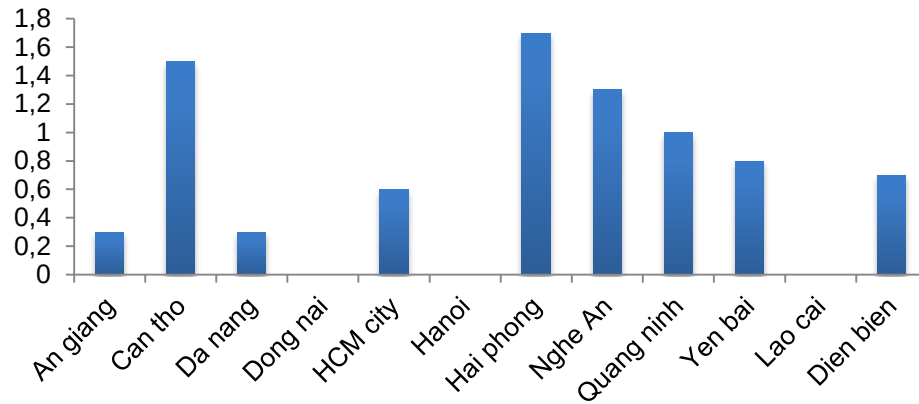
Summary of HIV epidemic

- Concentrated epidemic
 - The overall prevalence is low, estimated 0.36% in adults aged 15-49
 - The epidemic is concentrated among PWID, MSM, FSW
- Considerable expansion of prevention, care and treatment interventions

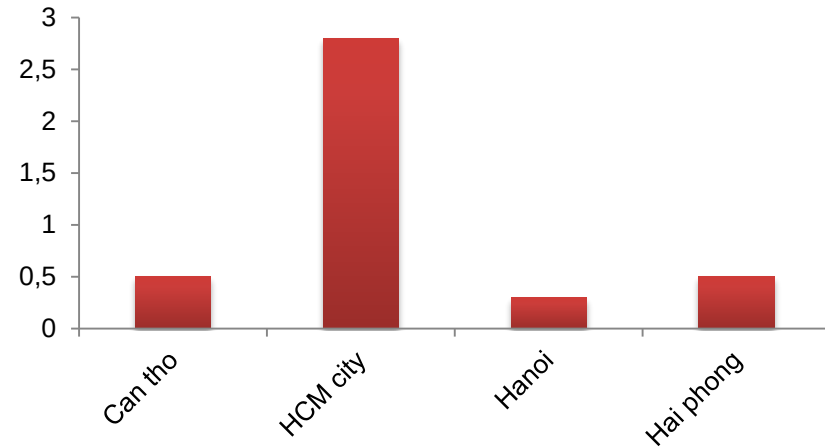


Syphilis infection in key-population (IBBs 2009)

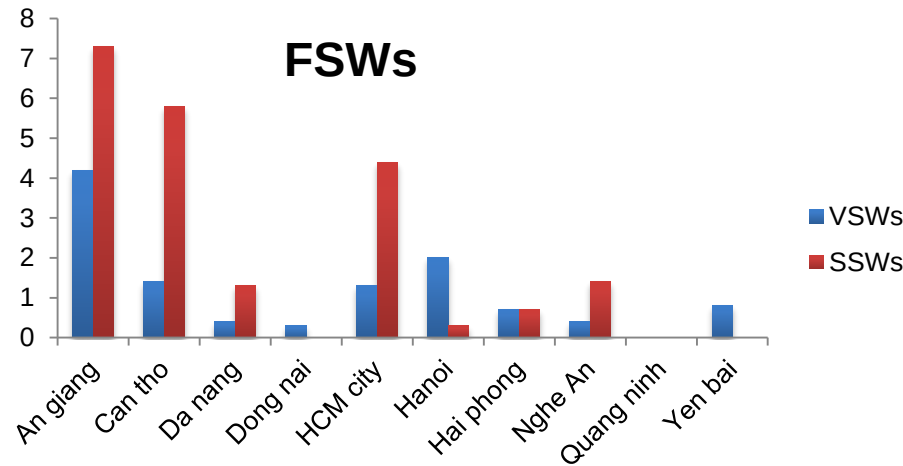
PWIDs



MSMs



FSWs



Community-based Studies on HBV Infection

Population	Location	Year	HBsAg (%)	Anti-HBc (%)
Rural (n=890) ¹	HCM city	1998	5.7	
Rural (n=1,579) ²	Thanh hoa	1998	16.8	49.5
Rural (n=837) ^{3,4}	Thai Binh	2002-3	19.0	68.2
Rural (n=383) ⁵	Thai Nguyen	2006	8.9	44.6
Mountainous (n=1305) ⁶	Yen Bai	2011	13.3	
Nationwide (n=25.600) ⁷	32 provinces	2018	7.2	60.0

Sources:

¹J Med Virol. 1998;54(4):243-248

²Am J Trop Med Hyg. 2003;69(3):288-294

³J Gastroenterol Hepatol. 2007;22(12):2093-2100

⁴Hepatol Int. 2007; 1: 387-393

⁵Asian Pac J Cancer Prev.2009;10(1):97-102

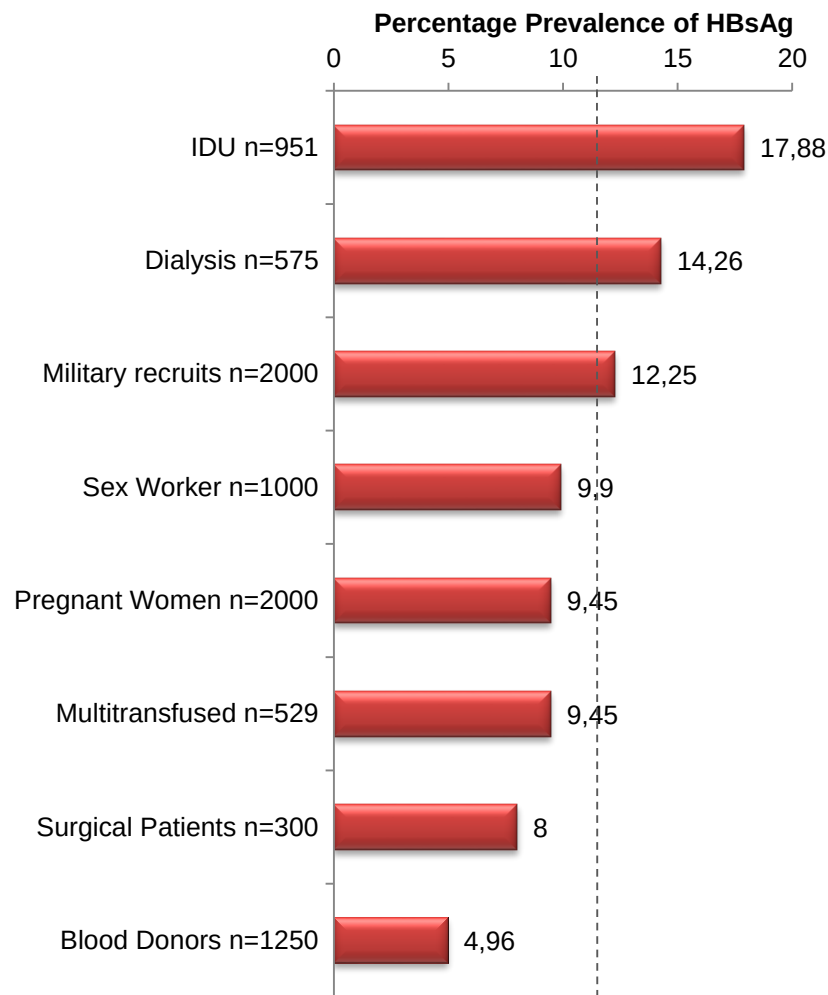
⁶J Pev Med. 2013 ; XXIII (11): 49-54

⁷. Personal communication



Prevalence of HBV in High-risk People

(Blood-Borne Virus Infection study, 2008-2009)



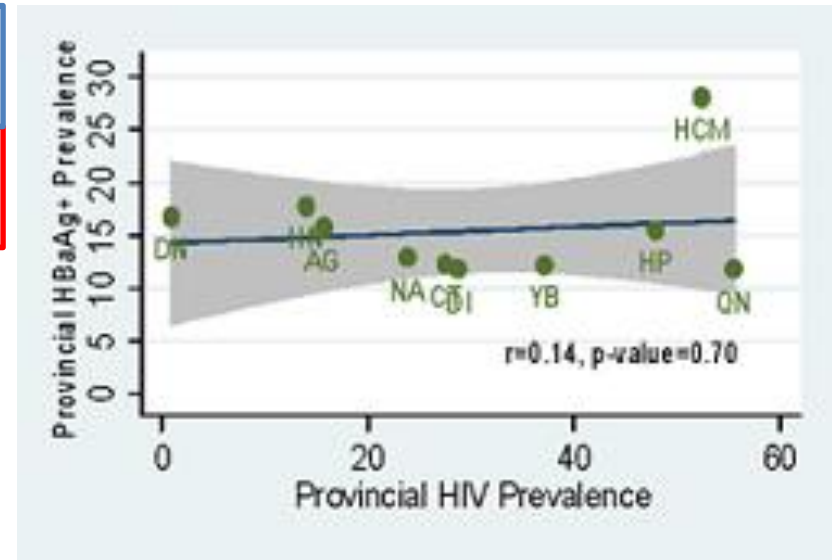
Published on Plos One (2012) 7(6);e39027



National Institute of Hygiene and Epidemiology

HBV Infection among MWIDs (IBBS 2009-2010)

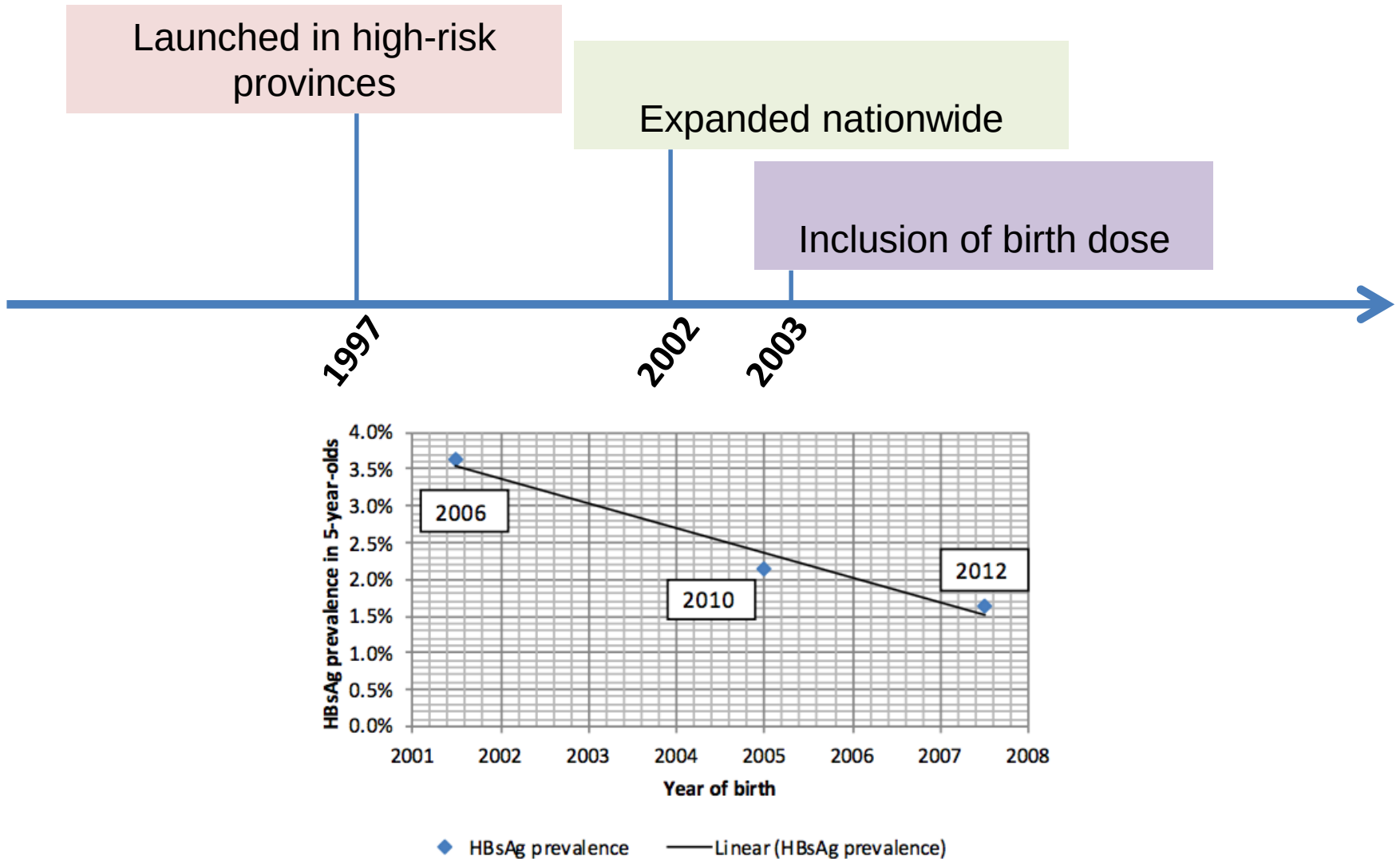
Sero-marker	%
HIV	28.1 (1–55.5)
HBsAg+	14.1 (11.7–28)
HIV+	15.7 (9.6–66.7)
HIV-	16.4 (10.3–22.8)
HBsAg-/total anti-HBc+	71.4 (49.9–83.1)
HIV+	81.2 (31.7–100)*
HIV-	64.7 (49–78.1) *
HCV Ag/Ab+	53.8 (10.9–87.4)
HIV+	95.8 (35.5–99.4) *
HIV-	52.2 (10.9–80.8) *
HBV, HCV and HIV prevalence (among all enrollees with a recorded result)	
HBsAg+/HIV+ % (95% CI)	4.6 (0.9–13.4)
anti-HBc+/HIV+ % (95% CI)	19.7 (0.1–39)
HCV Ag/Ab+/HIV+ % (95% CI)	26.3 (14.1–55.2)
HBsAg+/HCV Ag/Ab+/HIV+ % (95% CI)	1.2 (0.3–2.9)



Published on Plos One (2015) 7(6);e39027

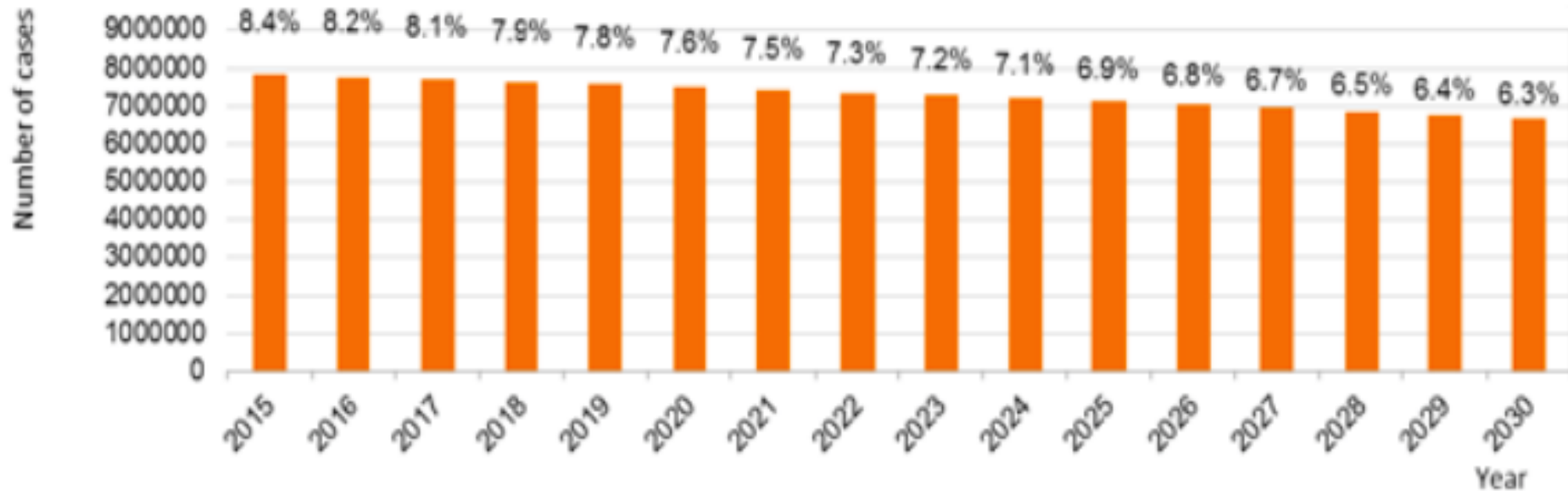


Impact of HBV Vaccine Program



Source: [Vaccine](#). 2014; 32(2):217-22.

Estimation of chronic hepatitis B infection in Vietnam, 2015-2030



HDV infection in patients with liver diseases

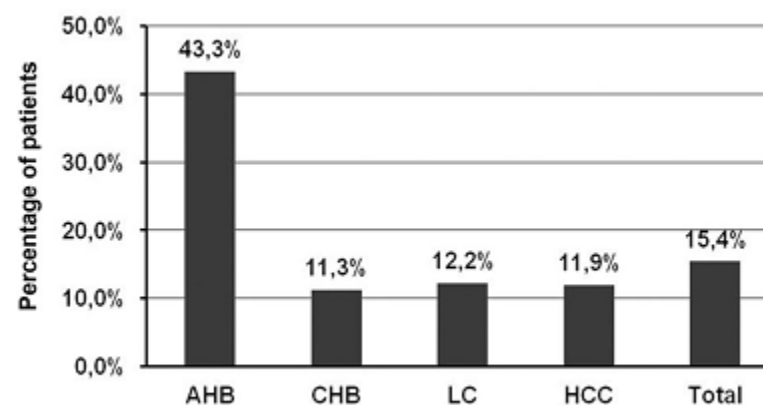
OPEN ACCESS Freely available online

PLOS ONE

High Prevalence and Significance of Hepatitis D Virus Infection among Treatment-Naïve HBsAg-Positive Patients in Northern Vietnam

Bui Tien Sy^{1,2}, Boris A. Ratsch¹, Nguyen Linh Toan², Le Huu Song³, Christian Wollboldt¹, Agnes Bryniok¹, Hung Minh Nguyen⁴, Hoang Van Luong², Thirumalaisamy P. Velavan⁵, Heiner Wedemeyer⁶, Peter G. Kremsner⁵, C.-Thomas Bock^{1,7*}

	AHB n=30	CHB n=62	LC n=84	HCC n=90
Age (y)	35*	40	51***	53***
Sex (male/female)	24/6	52/10	66/18	76/14
ALT (IU/L)	969.0***	147.5	63.0	60.5
AST (IU/L)	1128.5***	156.5	67.5	59.5
Total Bilirubin (mg/dl)	123.9***	31.5	29.4	17.5
Direct Bilirubin (mg/dl)	92.7***	17.0	16.0	8.2
AFP (mg/dl)	ND	ND	ND	87.1
HBV load ¹ (copies/ml)	3.77	4.05	3.98	3.86



National Institute of Hygiene and Epidemiology

HDV infection in PWIDs, Vietnam

Technical Appendix Table 1. Hepatitis B surface antigen seropositivity in persons who inject drugs from 5 study regions in Vietnam*

Group/HBV Serostatus	Northern no. (%)		Central no. (%)	Southern no. (%)		Total no. (%)
	Ha Noi	Hai Phong	Da Nang	Khanh Hoa	Can Tho	
PWIDs	400	400	400	400	399	1,999
HBsAg (+)	43 (10.8)	51 (12.8)	76 (19)	74 (18.5)	56 (14)	300 (15)

*HBV, hepatitis B virus; PWIDs, persons who inject drugs; HBsAg, hepatitis B surface antigen.

Technical Appendix Table 2. Hepatitis delta virus IgG and IgM seropositivity in hepatitis B surface antigen-positive persons who inject drugs in 5 study regions in Vietnam*

Characteristics	Northern, no. (%)		Central, no. (%)	Southern, no. (%)		Total, no. (%)
Serologic Markers	Ha Noi, 43	Hai Phong, 51	Da Nang, 76	Khanh Hoa, 74	Can Tho, 56	294*
HDV IgG (+)	13 (30.2)	15 (29.4)	4 (5.3)	6 (8.1)	7 (12.5)	45 (15.3)
HDV IgM (+)	5 (11.6)	8 (15.6)	2 (2.6)	5 (6.7)	0 (0)	20 (6.8)

*Of the 300 hepatitis B surface antigen-positive samples (Table 1), 294 were available for analysis; the remaining 6 had insufficient sample volumes. HDV, hepatitis delta virus.

Published on Emerging Infectious Diseases (2015) 21(3); 540-3



Community-based Studies on HCV Infection

Population	Location	Year	Anti-HCV (%)
Rural (n=890) ¹	HCM city	1998	1.0
Rural (n=837) ²	Thai Binh	2002-3	1.0
Mountainous (n=1305) ³	Yen Bai	2011	1.22
Nationwide (n=26.400) ⁴	33 provinces	2018	1.0

Sources:

¹*J Med Virol.* 1998;54(4):243-248

²*Hepatol Int.* 2007; 1: 387-393

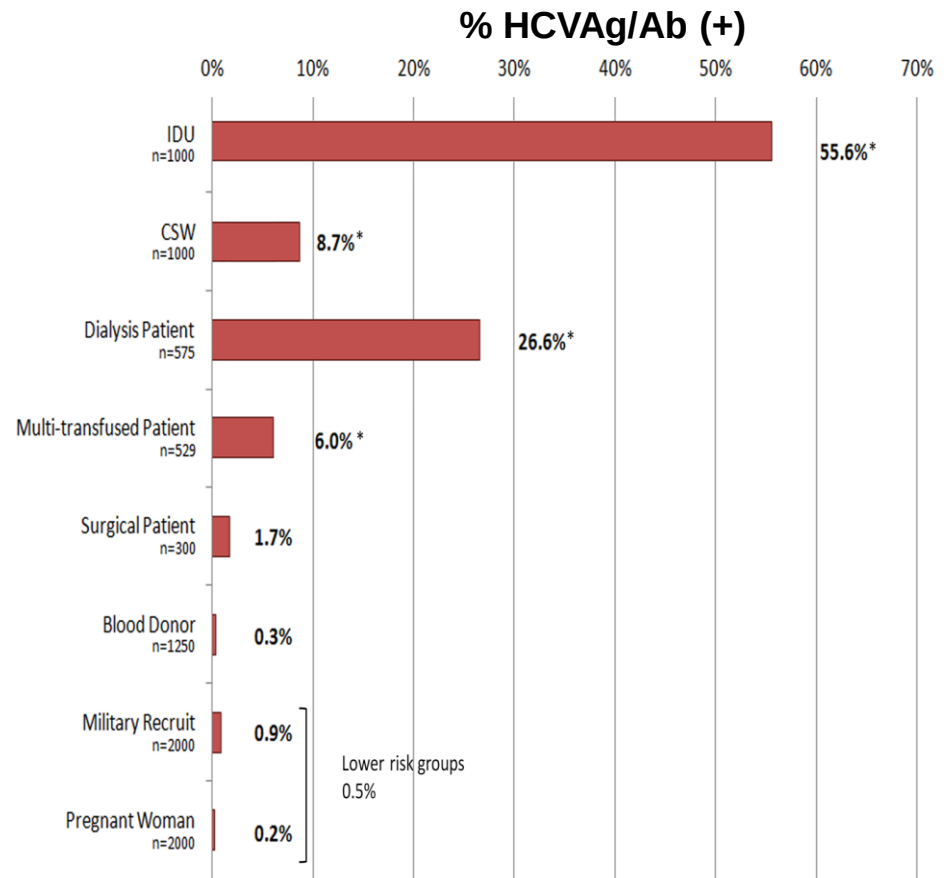
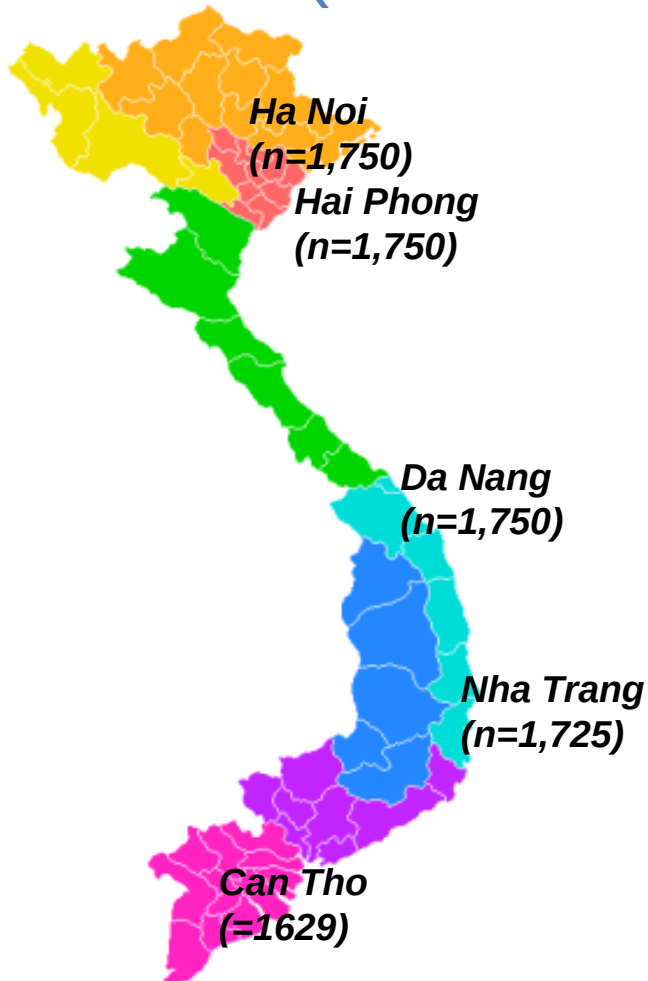
³*J Prev Med.* 2013 ; XXIII (11): 49-54

⁴*Personal communication*



High Prevalence of anti-HCV in High-risk Groups

(Blood-Borne Virus Infection study, 2008-2009)



* Significantly higher prevalence compared to lower risk groups, $p < 0.0001$

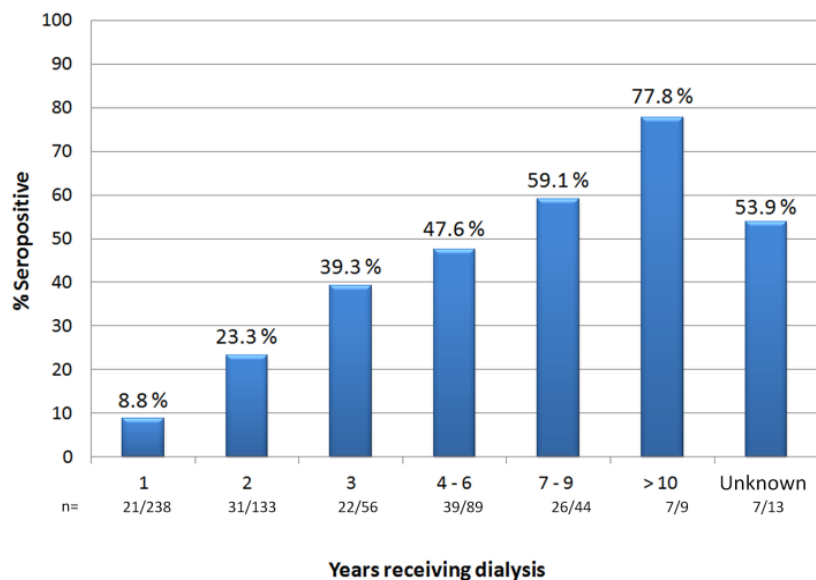
Published on Plos One (2012) 7(8);e41266



National Institute of Hygiene and Epidemiology

HCV infection and Associated Factors in Dialysis Patients in Viet Nam

	Ha Noi	Hai Phong	Da Nang	Khanh Hoa	Can Tho	Total
Total Tested	100	100	100	125	150	575
HCV Ab/Ag Pos	43.0%	11.0%	32.0%	32.8%	17.3%	26.6%
HCV pos with RNA	90.7%	54.5%	68.8%	73.1%	61.5%	73.9%
Mean Viral Load Log ₁₀ IU/ml	5.0	3.4	4.2	4.6	4.7	4.6



Variable	OR (95% CI)	p-value
Age	1.01 (1.00-1.02)	0.185
Male Gender	1.60 (1.06-2.41)	0.026*
Duration Receiving Transfusions	1.07 (1.01-1.13)	0.023*
Duration Receiving Dialysis	1.31 (1.19-1.43)	<0.001*
History of Surgery	0.98 (0.64-1.50)	0.936

Published on Plos One (2012) 7(6);e39027



Prevalence of anti-HCV among key populations in Vietnam

Population	Estimate population size (year)	Anti-HCV prevalence (IBBS, year)	HIV prevalence (sentinel surveillance, year)	Estimated HIV prevalence (Asian Epidemic Model, year)
PWID	271 506 (2013)	53.8% (2009–2010)	10.5% (2014)	23.4% (2014)
FSW	71 936 (2013)	8.7% (2008–2009)	2.5% (2014)	4.0% (2014)
MSM	382 506 (2013)	28.4% (2009–2010)	3.7% (2013)	2.2% (2014)

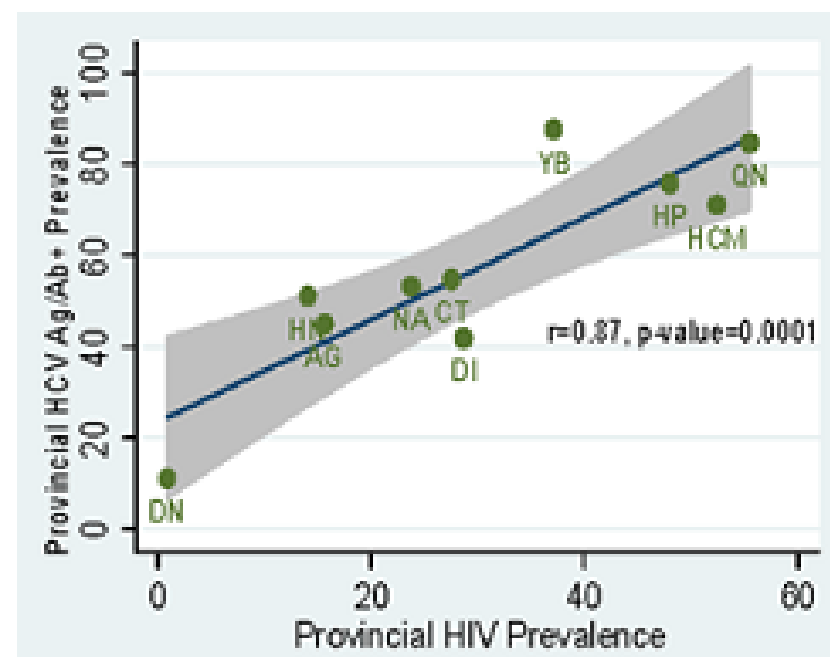
Source: WHO, Viral Hepatitis Situation and response in Vietam (2018)



National Institute of Hygiene and Epidemiology

HCV Infection among MWIDs (IBBS 2009-2010)

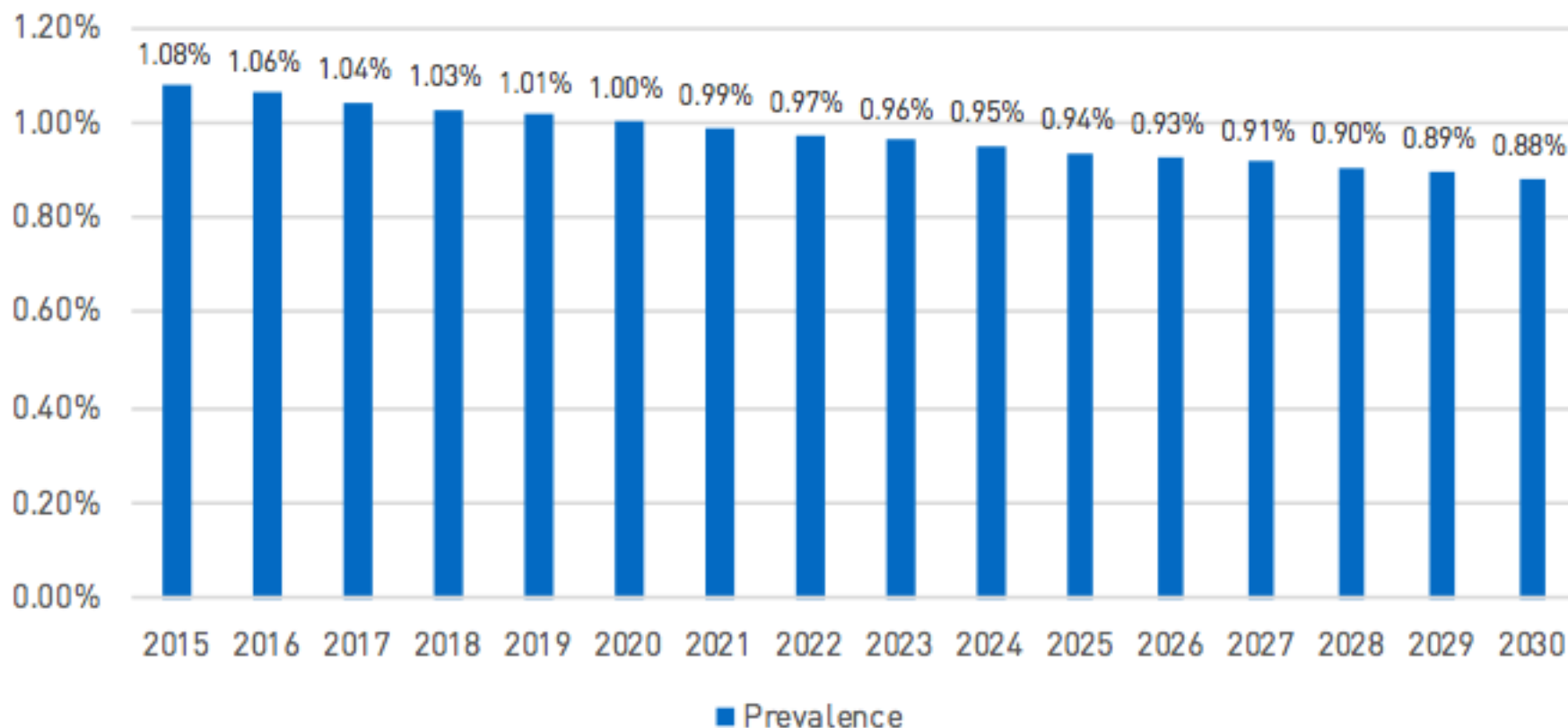
Sero-marker	Me prc	%
HIV	28.1 (1–55.5)	
HBsAg+	14.1 (11.7–28)	
HIV+	15.7 (9.6–66.7)	
HIV-	16.4 (10.3–22.8)	
HBsAg-/total anti-HBc+	71.4 (49.9–83.1)	
HIV+	81.2 (31.7–100)*	
HIV-	64.7 (49–78.1) *	
HCV Ag/Ab+	53.8 (10.9–87.4)	
HIV+	95.8 (35.5–99.4) *	
HIV-	52.2 (10.9–80.8) *	
HBV, HCV and HIV prevalence (among all enrollees with a recorded result)		
HBsAg+/HIV+ % (95% CI)	4.6 (0.9–13.4)	
anti-HBc+/HIV+ % (95% CI)	19.7 (0.1–39)	
HCV Ag/Ab+/HIV+ % (95% CI)	26.3 (14.1–55.2)	
HBsAg+/HCV Ag/Ab+/HIV+ % (95% CI)	1.2 (0.3–2.9)	



Source: Plos One (2015) 7(6);e39027



Estimation of chronic hepatitis C infection in Vietnam, 2015-2030

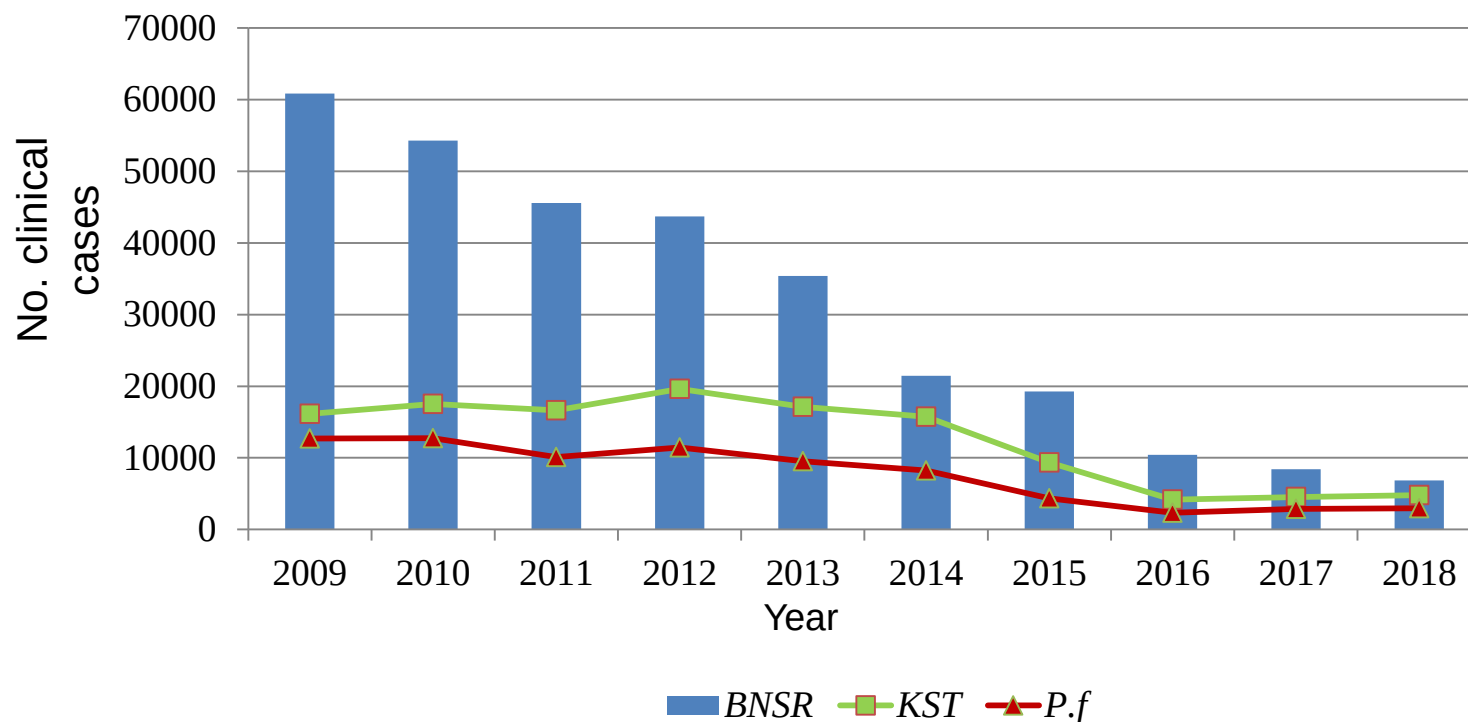


Summary

- HBV infection is highly common
 - Prevalence of HBsAg (+) in general population ranges 5,7%-19%
- HCV infection is highly concentrated among high-risk and highly affected group
 - Prevalence of HCV Ag/Ab(+)
 - General Population: 1,0 -1,22%
 - PWIDs: > 50%
 - PWIDs with HIV (+): > 90%
 - Dialysis patients: 26,6% and multi-transfused patients: 6%
- Surveillance on hepatitis viral infection need to be established



Situation of Malaria in Vietnam, 2009-2018



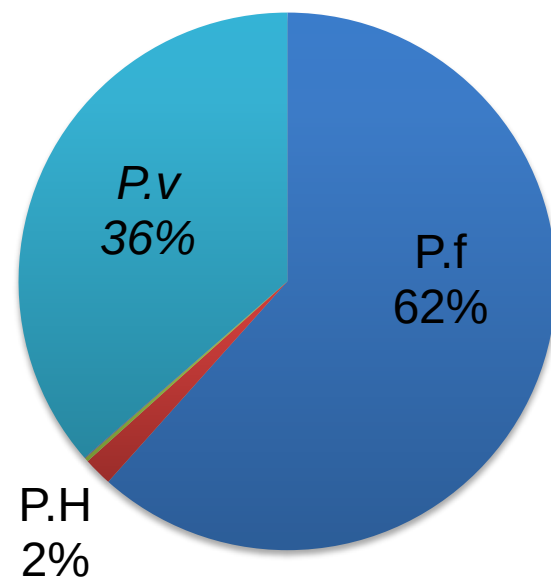
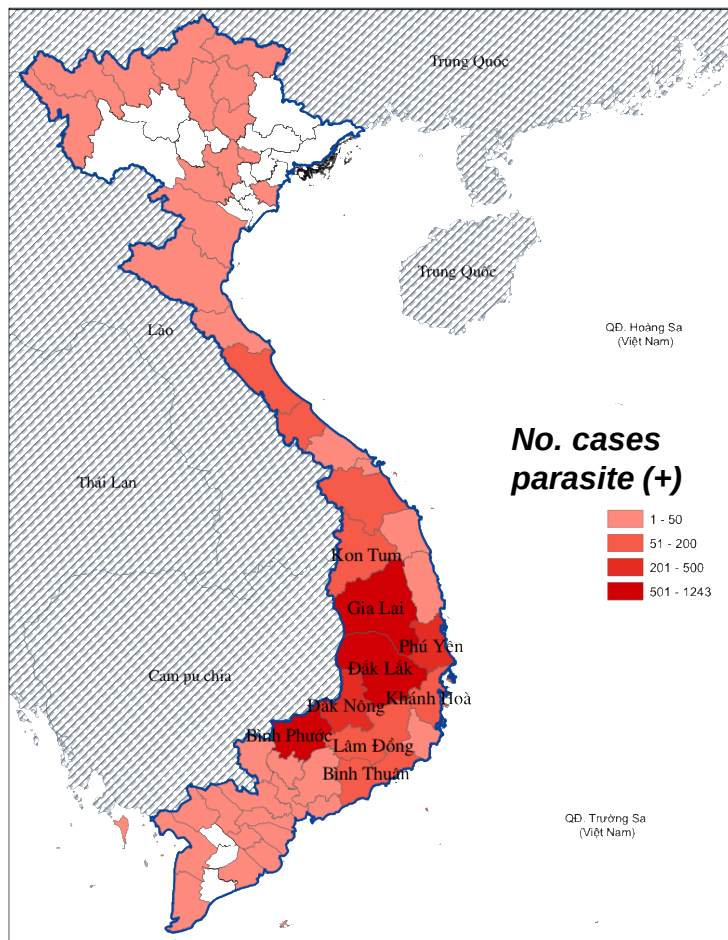
In 2018:

No. Clinical cases: 6.868, incidence/1.000: 0.074

No. cases Parasite (+): 4.811, rate/1.000: 0.052



Distribution of Malaria cases with parasite (+), 2018



Parasite (+) = 4.811



Conclusion and Recommendation

- Safety in blood donation and transfusion is a key component in current national programs of Vietnam toward ending HIV, viral hepatitis B and C in 2030
- System improvement is required for nationwide network of blood screening labs at:
 - 75 blood center at the provincial level
 - 150 blood bank departments in district hospital



Thank You for Your Attention!



National Institute of Hygiene and Epidemiology