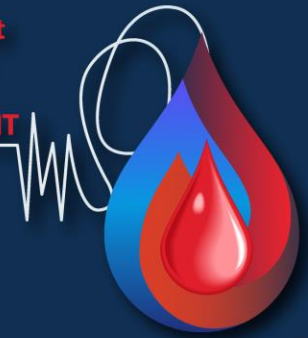


12

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Transfusional
Congreso Iberoamericano **GCIAMT**

*Nuevamente juntos, innovando
para fortalecer capacidades*

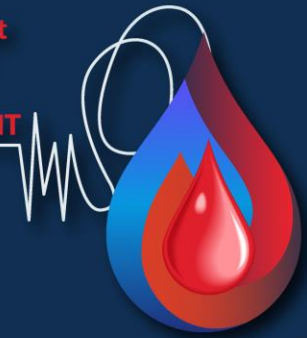


Riesgo de transmisión de infecciones y diferentes estrategias de pruebas

12

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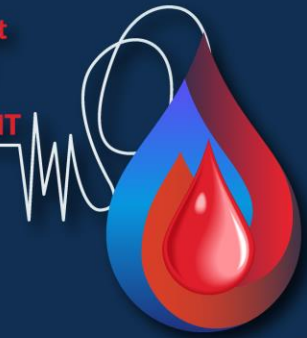


POTENCIAL CONFLICTO DE INTERESES:

En los últimos 2 años recibí honorarios por conferencias de las empresas Roche y Grifols.

12

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Ponente: José Eduardo Levi

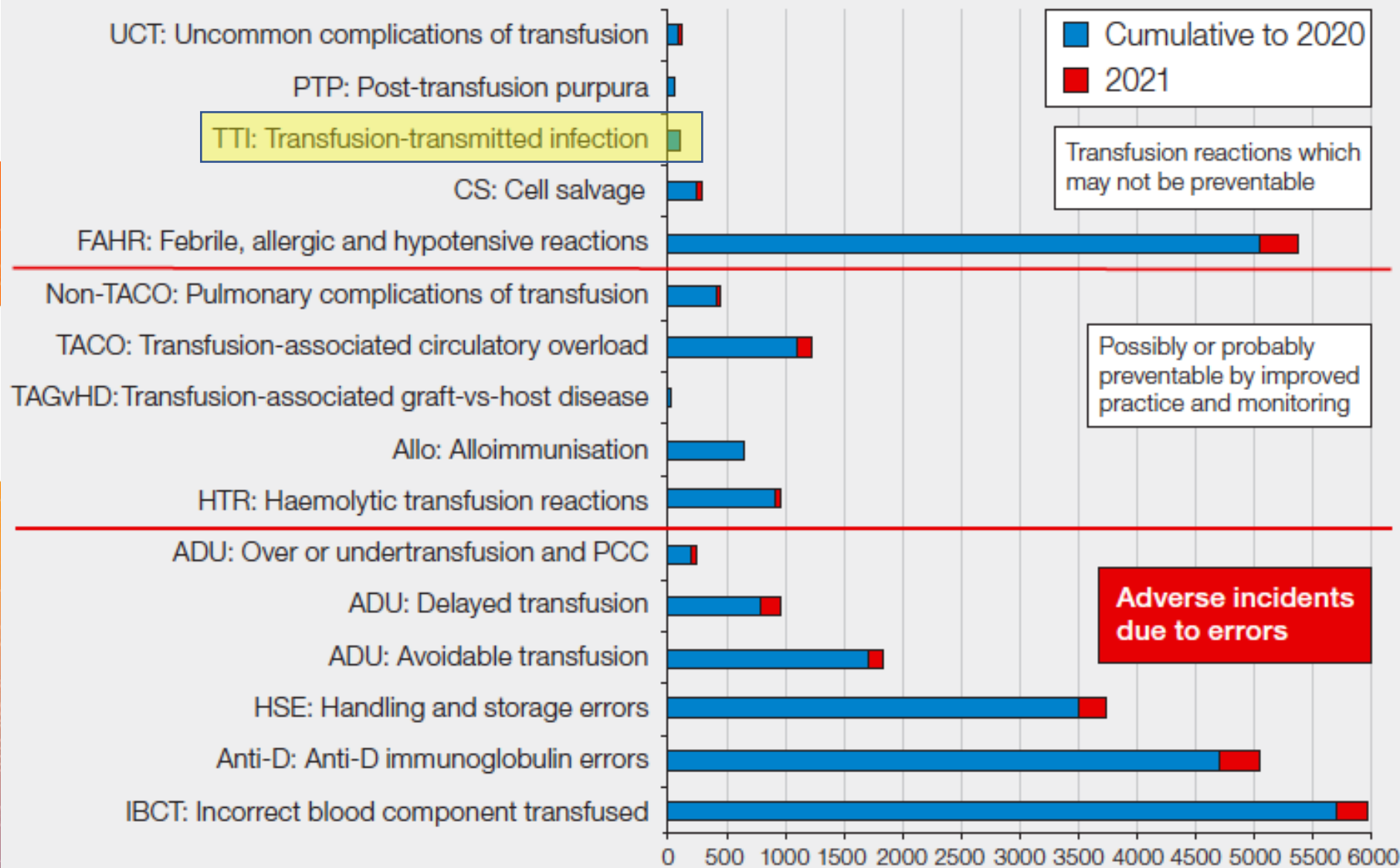
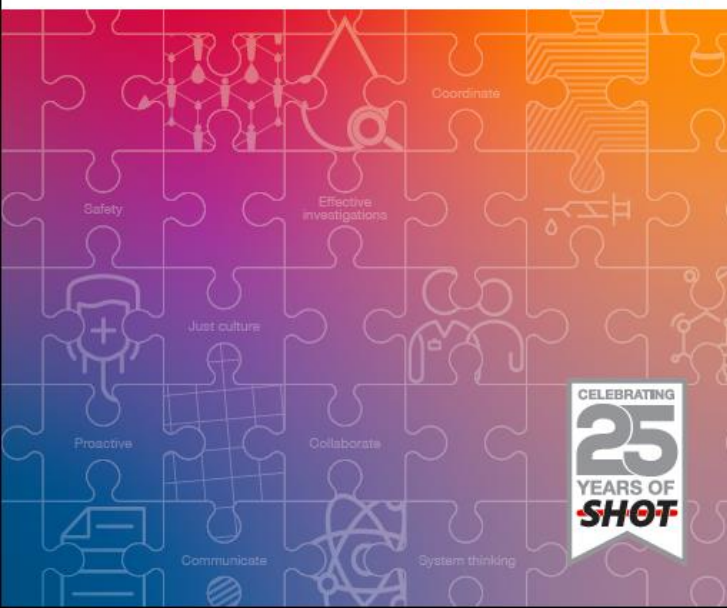
- Biólogo
- Doctor en Virología
- Investigador del Instituto de Medicina Tropical de la Universidad de São Paulo, Brasil
- Superintendente de Investigación y Desarrollo de la red Dasa
- Director Regional América Latina, Sociedad Internacional de Transfusión Sanguínea (ISBT), 2022-2024

Riesgo de transmisión de infecciones x otros riesgos

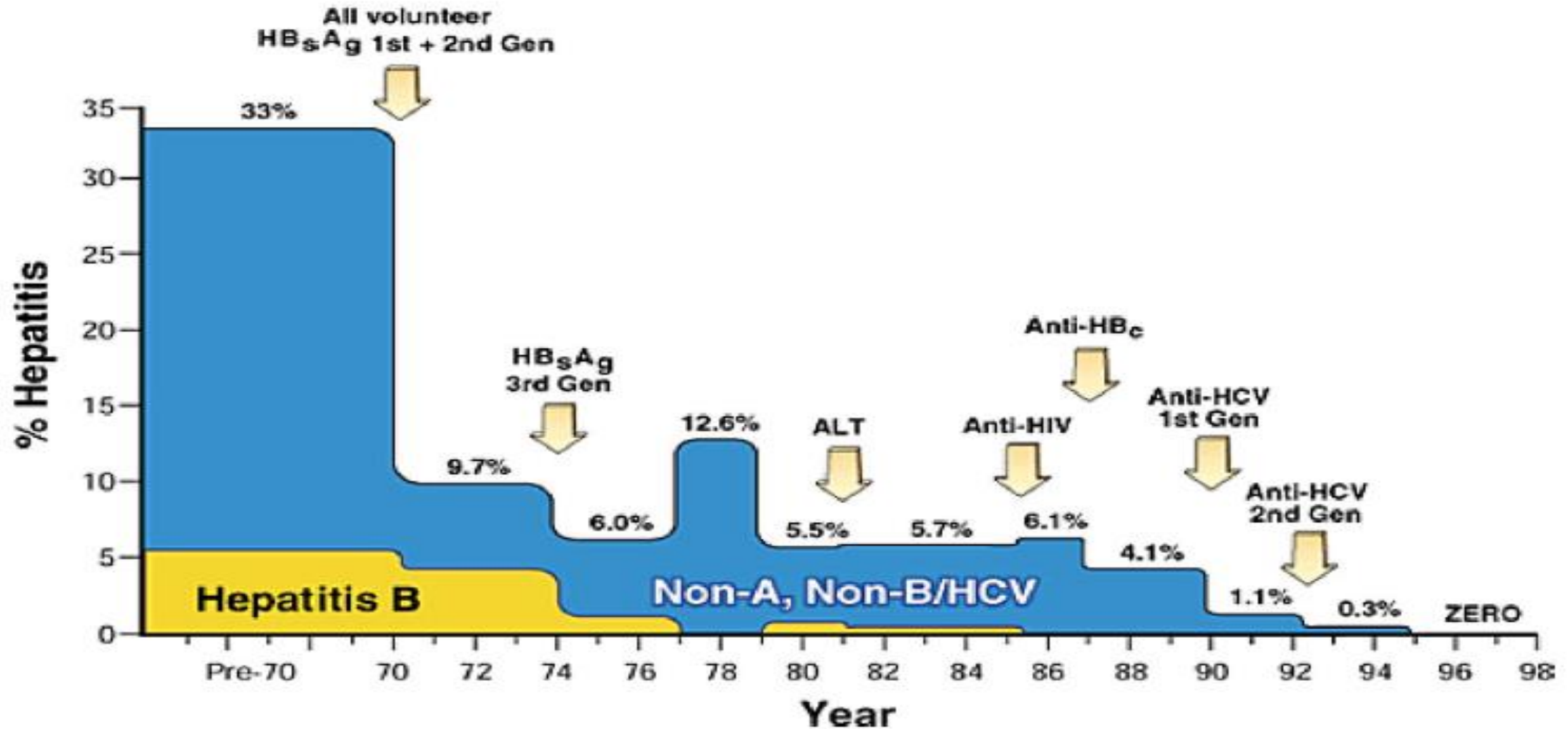


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Involución del riesgo de transmisión de infecciones



Otros Riesgos Transfusionales

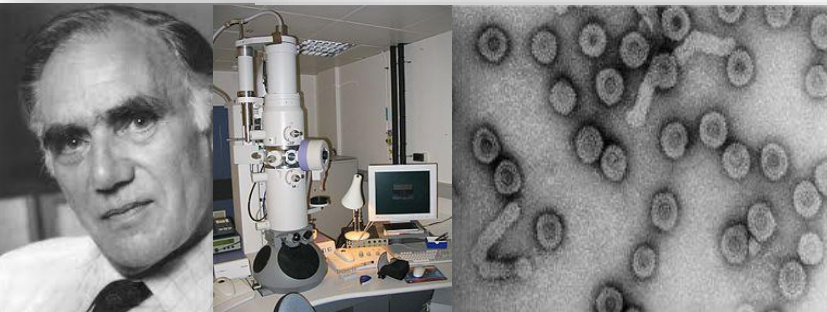
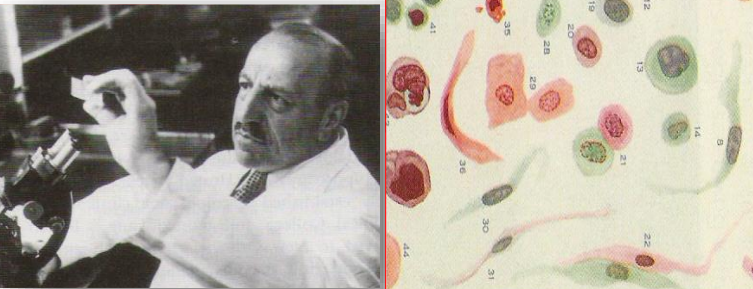
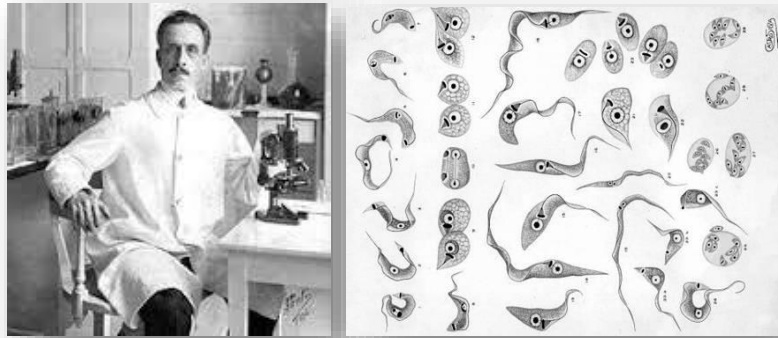
Table 3.2:
Risk of transfusion
reaction by
reaction type
2012-2021

Transfusion reaction	Risk of transfusion reaction based on SHOT data 2012-2021
Febrile, allergic or hypotensive reactions	1 in 8,138
Transfusion-associated circulatory overload	1 in 23,175
Haemolytic transfusion reactions	1 in 55,216
Pulmonary non-TACO	1 in 117,530
Post-transfusion purpura	1 in 3,085,171
Transfusion-associated graft vs host disease	1 in 24,681,368

EVOLUCIÓN DE LAS PRUEBAS PARA ENFERMEDADES INFECCIOSAS

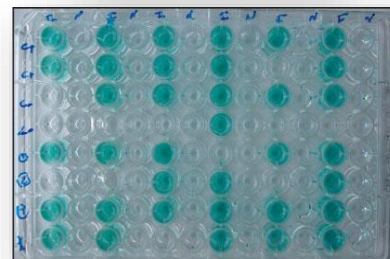
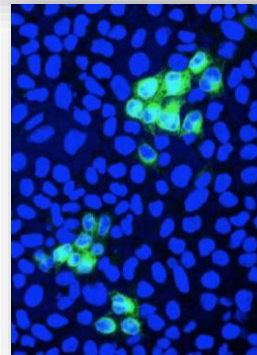
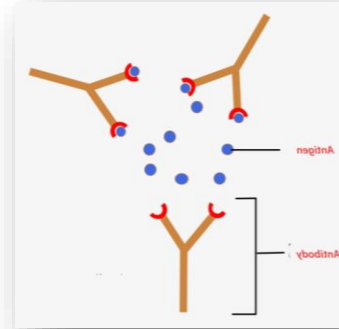
Hasta 1950

MICROSCOPIA



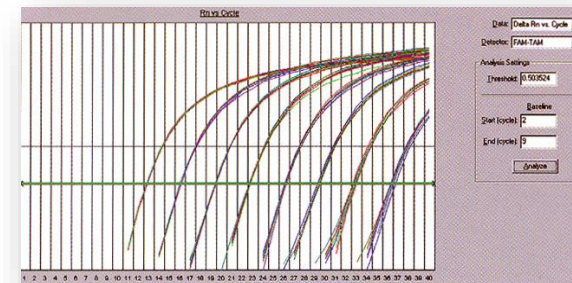
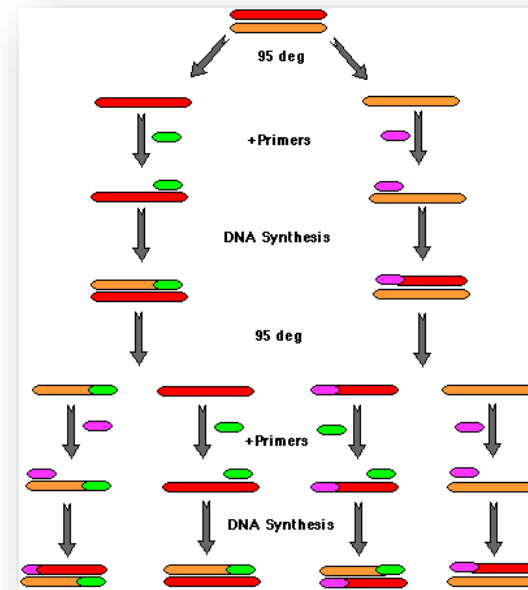
1960-2000

SEROLOGÍA



2001-2025

NAT



2025-?

NGS



PRUEBAS OBLIGATORIAS DONACIONES DE SANGRE, ÓRGANOS Y TEJIDOS – BRASIL 2022

HIV	Anti-HIV 1 + 2 + O Ac/Ag p24	NAT - 2013
HTLV	Anti-HTLV 1 + 2	
HBV	Anti-HBc HBsAg	NAT - 2016
HCV	Anti-HCV o Ac/Ag C	NAT - 2013
Sífilis	Anti- <i>T.pallidum</i> o VDRL/RPR	
Chagas	Anti- <i>T.cruzi</i>	
Malária	Gota grossa o Testes antigênicos	

Riesgo de transmissão de infecções

Tabela 7: Frequências absoluta (f) e relativa (%) das reações transfusionais notificadas, segundo o tipo de reação, o diagnóstico e o ano da ocorrência. Brasil, 2007 a 2015.

	Diagnóstico da reação	2007		2008		2009		2010		2011		2012		2013		2014		2015	
		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
I M E D I A T A S	Reação Febril não hemolítica - RFNH	1.192	53,0	1.216	49,0	1.883	49,0	2.514	50,2	3.488	49,6	4.004	46,2	4.731	47,4	5.476	48,4	5.048	47,9
	Alérgica	731	32,5	919	37,0	1.422	37,0	1.788	35,7	2.554	36,3	3.402	39,2	3.923	39,3	4.487	39,7	4.149	39,3
	Anafilática	15	0,7	16	0,6	32	0,8	40	0,8	38	0,5	50	0,6	75	0,8	59	0,5	70	0,7
	Contaminação bacteriana	7	0,3	12	0,5	6	0,2	10	0,2	10	0,1	17	0,2	20	0,2	26	0,2	24	0,2
	Reação Hemolítica aguda imunológica- RHAI	15	0,7	8	0,3	27	0,7	16	0,3	39	0,6	32	0,4	36	0,4	49	0,4	45	0,4
	Lesão Pulmonar Aguda Associada à Transfusão- TRALI	20	0,9	25	1,0	26	0,7	31	0,6	55	0,8	79	0,9	62	0,6	61	0,5	67	0,6
	Reação Hemolítica aguda não imune- RHANI	4	0,2	4	0,2	14	0,4	13	0,3	9	0,1	7	0,1	19	0,2	12	0,1	14	0,1
	Reação Hipotensiva	7	0,3	9	0,4	18	0,5	21	0,4	31	0,4	64	0,7	79	0,8	73	0,6	73	0,7
	Sobrecarga volêmica	51	2,3	76	3,1	124	3,2	139	2,8	272	3,9	338	3,9	444	4,5	475	4,2	450	4,3
	Outras reações imediatas	138	6,1	116	4,7	220	5,7	338	6,7	457	6,5	558	6,4	466	4,7	438	3,9	452	4,3
	Subtotal	2.180	97,0	2.401	97,0	3.772	98,0	4.910	98,0	6.953	99,0	8.551	99,0	9.855	99,0	11.156	99,0	10.392	99,0
T A R D I A S	Doença transmissível	3	0,1	10	0,4	4	0,1	11	0,2	10	0,1	18	0,2	4	0,0	1	0,0	4	0,0
	Doença do enxerto contra o hospedeiro-GVHD	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0
	Reação Hemolítica Tardia -RHT	3	0,1	1	0,0	4	0,1	7	0,1	1	0,0	5	0,1	11	0,1	15	0,1	11	0,1
	Anticorpos irregulares/Isoimunização	62	2,8	61	2,5	46	1,2	64	1,3	50	0,7	76	0,9	87	0,9	111	1,0	117	1,1
	Outras reações tardias	3	0,1	11	0,4	20	0,5	16	0,3	17	0,2	22	0,3	15	0,2	24	0,2	23	0,2
	Subtotal	71	3,0	83	3,0	74	2,0	98	2,0	78	1,0	121	1,0	117	1,0	151	1,0	155	1,0
	Total	2.251		2.484		3.846		5.008		7.031		8.672		9.972		11.307		10.547	

Agente envolvido	1995	1997	1999	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
CMV	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	0	4
HBV	0	0	0	0	1	0	0	0	1	2	3	3	1	5	2	1	0	19
HCV	0	0	0	0	0	0	0	0	1	2	2	2	2	2	0	1	1	13
HIV	1	1	1	1	1	0	2	1	1	3	5	1	4	3	2	1	0	28
HTLV	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	3
Plasmodium vivax	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	4
Treponema	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Não Informado	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
ZIKAV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	1	1	1	1	2	1	2	4	4	8	10	8	8	12	4	6	2	75

NAT - REDUCCIÓN SIGNIFICATIVA DEL RIESGO

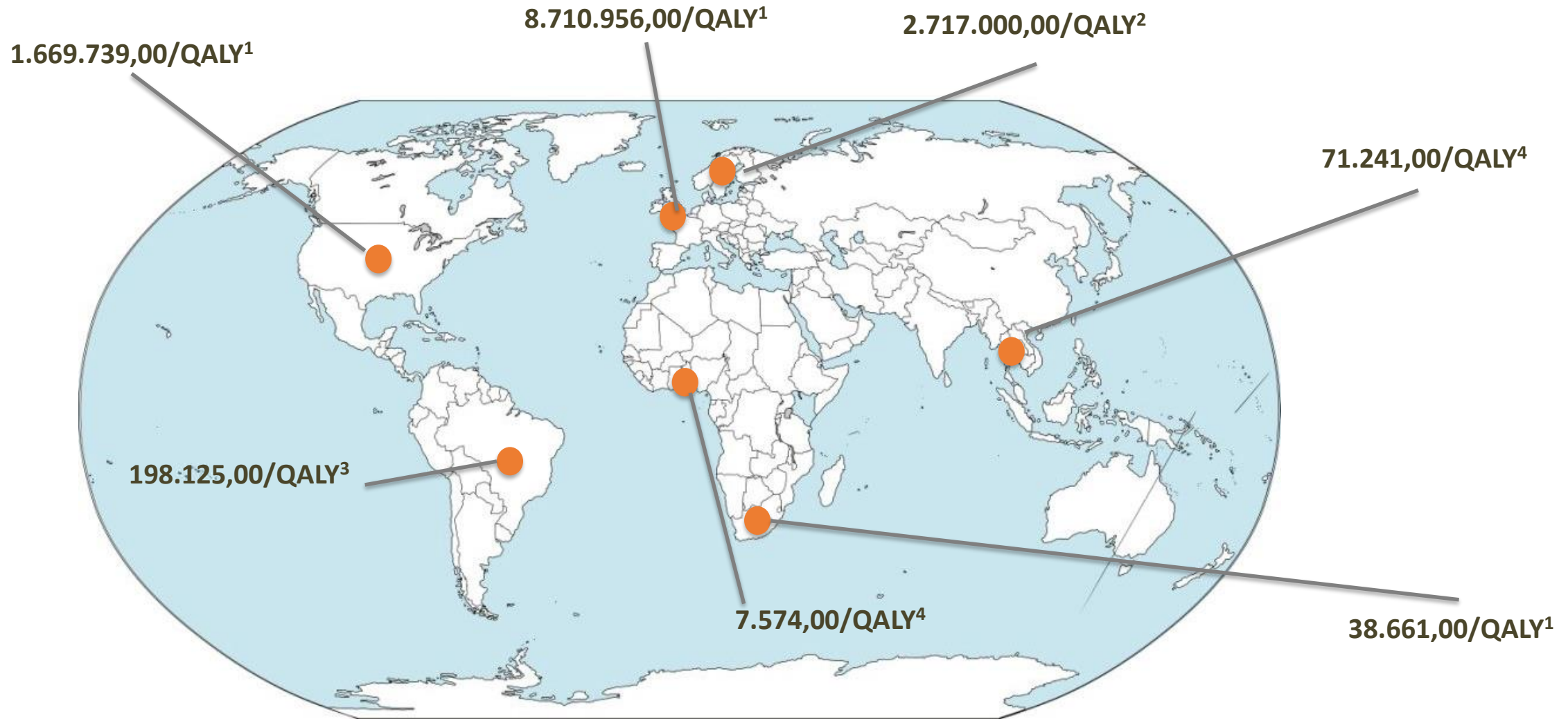
The Brazilian experience of nucleic acid testing to detect human immunodeficiency virus, hepatitis C virus, and hepatitis B virus infections in blood donors

TRANSFUSION 2018;58;862–870

DATOS NAT-BRASIL

	NAT Rendimiento	N Cribadas	TASA	TASA/ MILLION
HBV	42	5.795.424	1:138.000	7,24
HIV	63	13.610.536	1:216.040	4,62
HCV	28	13.610.536	1:486.000	2,05

ANÁLISIS DE COSTO-EFECTIVIDAD DE NAT EN EL MUNDO



1. Custer *et al.* Vox Sanguinis 2017 - MP16 (US\$ de 2014)
2. Davidson *et al.* Transfusion 2011 - ID-NAT (US\$ de 2007)
3. Relatório CONITEC n.26/2012
4. van Hulst *et al.*, Transfusion 2009

¿COMO MEJORAR LA COSTO-EFECTIVIDAD DE LAS PRUEBAS NAT?

- 1.REMOVER PRUEBAS SEROLÓGICAS Y/O ANTIGENICAS
- 2.AÑADIR OTROS MARCADORES
- 3.MULTIPLEX

SINERGIAS Y DISCREPANCIAS NAT X SEROLOGIA

	NAT		
SEROLOGIA			
	HBV-DNA	HCV-RNA	HIV-RNA
ANTI-HBc	1-3%*		
HBsAg	100%		
ANTI-HCV		75-85%#	
ANTI-HIV			>99%&

*INFECCIÓN OCULTA (OBI) POR VIRUS HEPATITIS B (HBV)

15-25% DE "CLAREADORES", PERSONAS QUE SE INFECTAN Y ELIMINAN EL HCV DE LA CIRCULACIÓN.
& CONTROLADORES DE ELITE

¿COMO MEJORAR LA COSTO-EFECTIVIDAD DE LAS PRUEBAS NAT?

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SHOT
Serious Hazards
of Transfusion

	Bacteria	HAV	HBV	HCV	HEV	HIV	HTLV I	Parvovirus (B19)	Malaria	vCJD or prion	Total
Death due to, or contributed to, by TTI	11	0	0	0	3	0	0	0	1	3	18
Major morbidity	29	3	14	2	9	4	2	1	1	1	66
Minor morbidity	4	1	0	0	4	0	0	0	0	0	9
Red blood cells	7	1	11	2	4	2	2	1	2	4	36
Pooled platelets	21	2	1	0	2	1	0	0	0	0	27
Apheresis platelets	16	1	1	0	4	0	0	0	0	0	22
Fresh frozen plasma	0	0	1	0	5	1	0	0	0	0	7
Cryoprecipitate	0	0	0	0	1	0	0	0	0	0	1

11/18 = 61%

29/66 = 44%

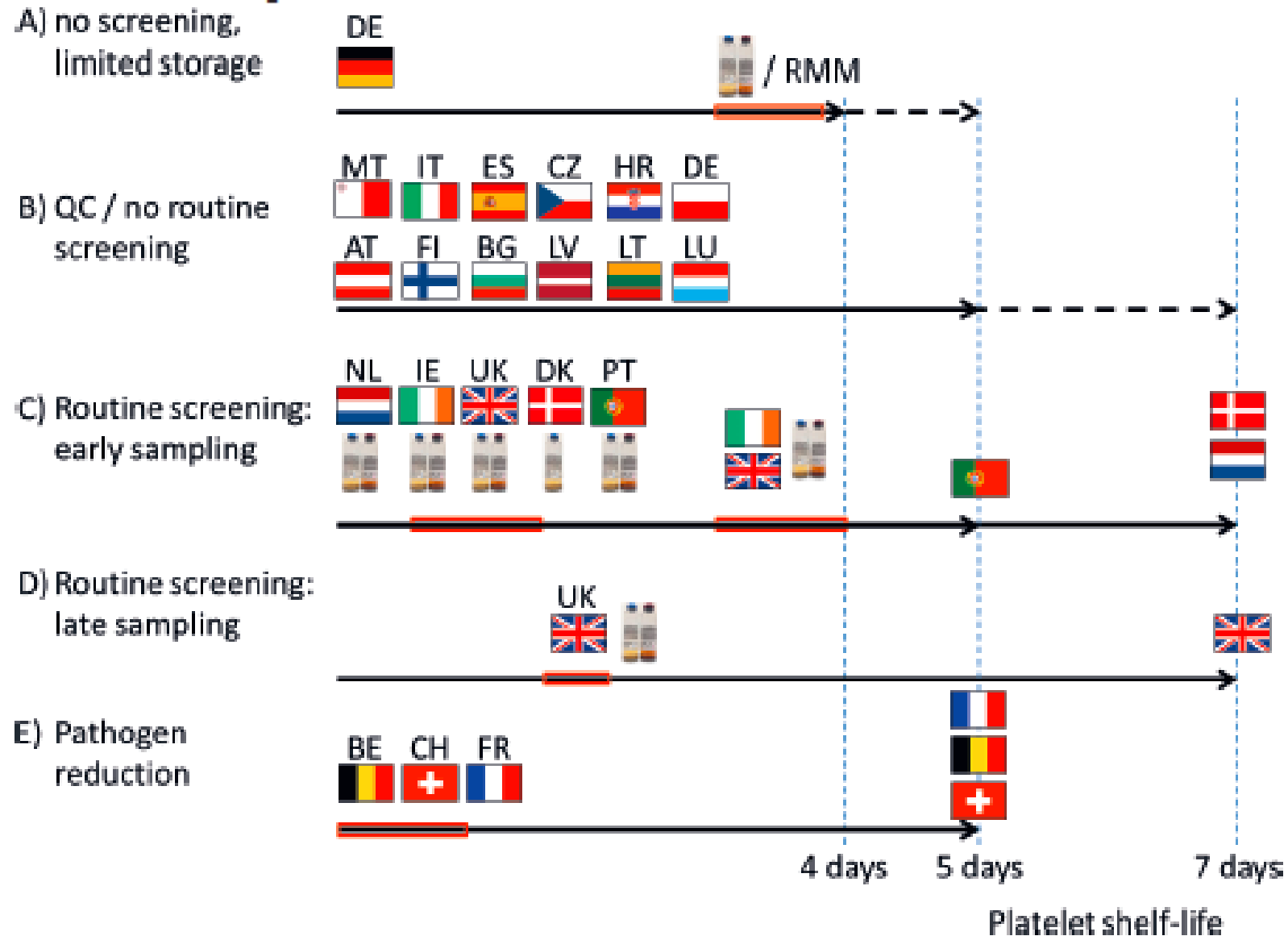
The international experience of bacterial screen testing of platelet components with automated microbial detection systems: An update

Hany Kamel¹  | Sandra Ramirez-Arcos^{2,3}  | Carl McDonald⁴  | for the ISBT
Transfusion-Transmitted Infectious Disease Bacterial Working Party Bacterial Subgroup

**TASA PROMEDIO DE CONTAMINACIÓN BACTERIANA EN
CONCENTRADOS DE PLAQUETAS = 1:5.000**

TASA PROMEDIO DE SEPSIS TRANSFUSIONAL = 1:50.000

Microbiological Screening of Platelet Concentrates in Europe

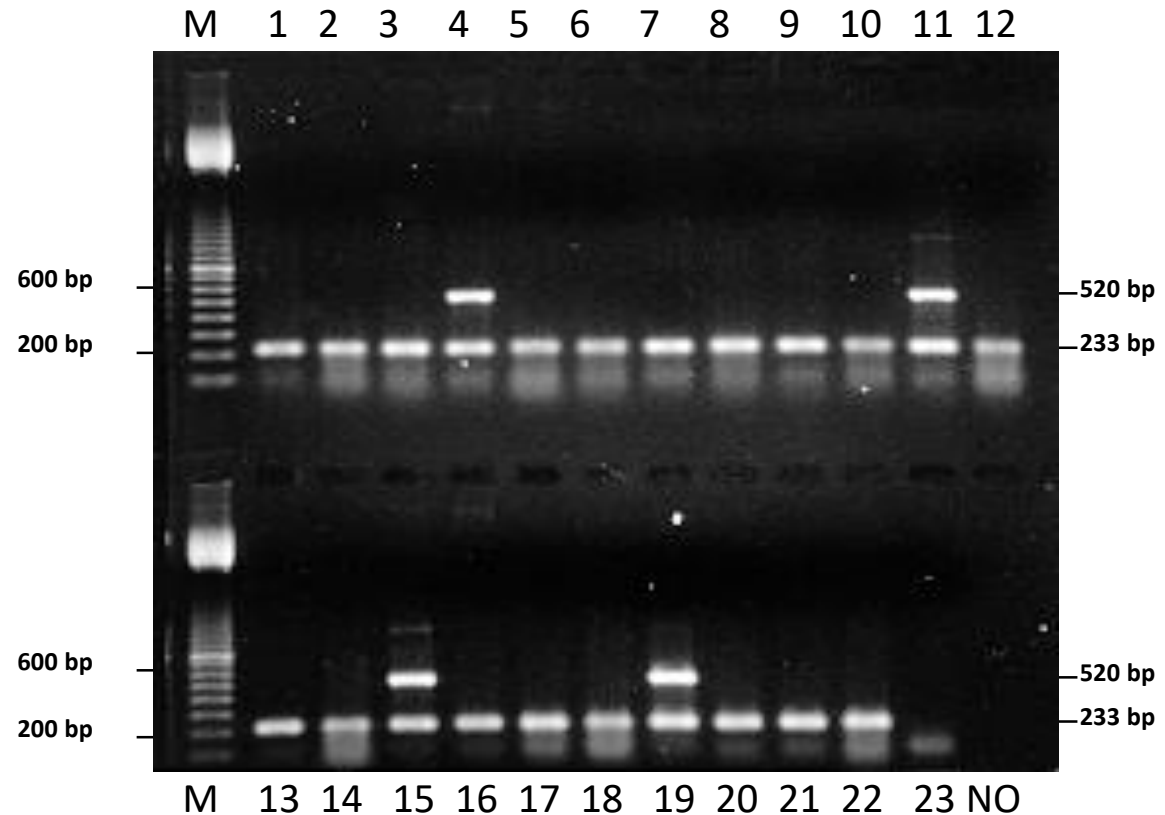


GENES RIBOSOMALES – MUY CONSERVADOS EVOLUTIVAMENTE

HAY SECUENCIAS de rADN HOMÓLOGAS A TODAS BACTÉRIAS

UNIVERSAL PCR – 16S rRNA

- 1- *B. cepacia* complex
- 2- *S. maltophilia*
- 3- *S. aureus*
- 4- ***P. aeruginosa***
- 5- *P. stutzeri*
- 6- *K. pneumoniae*
- 7- *H. influenzae*
- 8- *E. aerogenes*
- 9- *S. epidermidis*
- 10- *A. calcoaceticus*
- 11- ***P. aeruginosa***
- 12- *A. xylosoxidans*



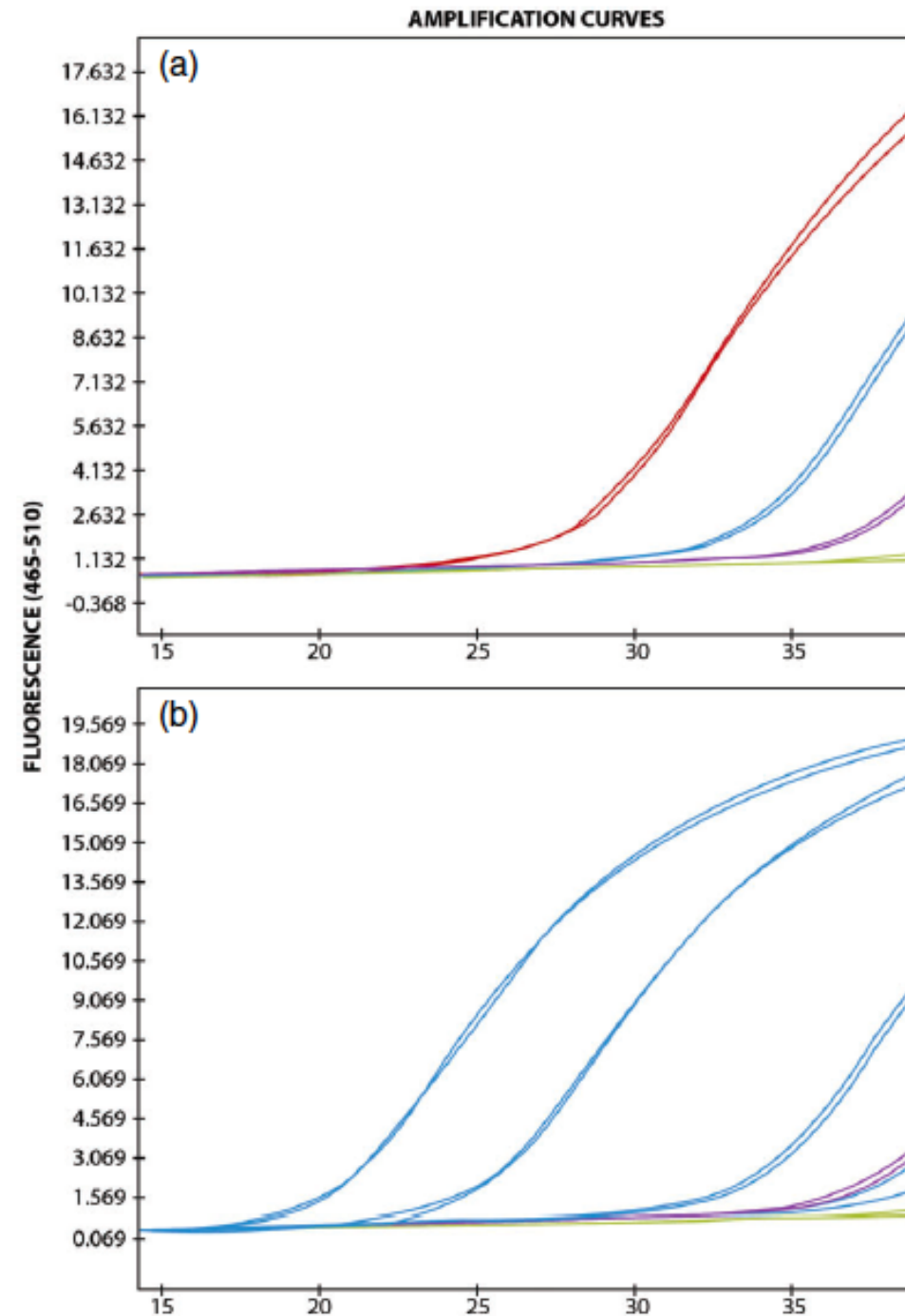
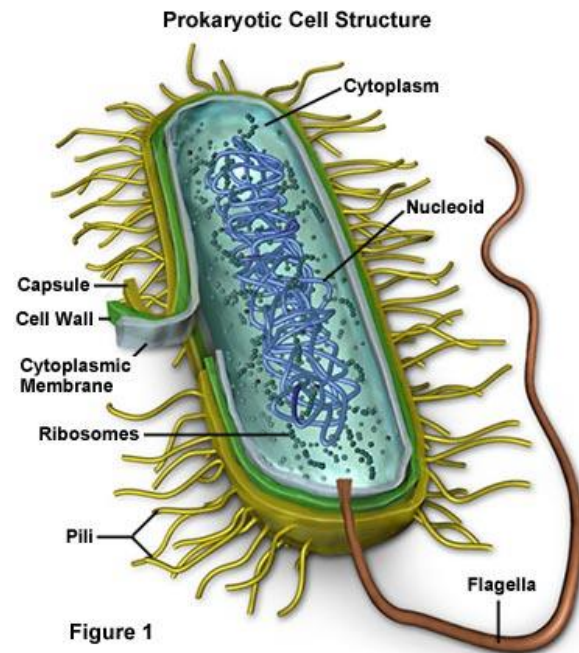
- 13- *E. coli*.
- 14- *P. acnes*
- 15- ***P. aeruginosa***
- 16- *E. cloacae*
- 17- *B. cereus*
- 18- *S. viridans*
- 19- ***P. aeruginosa***
- 20- *C. perfringens*
- 21- *B. subtilis*
- 22- *L. monocytogenes*
- 23- *S. enterica*
- NO- H₂O

Detection of bacterial contamination in platelet concentrates from Brazilian donors by molecular amplification of the ribosomal 16S gene

J. D. Viana,¹ S. C. Ferreira,¹ S. R. Matana,¹ F. Rossi,² P. Patel,³ J. A. Garson,^{3,4} V. Rocha,¹ R. Tedder,^{3,4} A. Mendrone-Júnior¹ & J. E. Levi¹

¹Fundação Pró-Sangue Hemocentro de São Paulo, São Paulo, Brazil, ²Departamento de Microbiologia do Laboratório Central, Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil, ³Microbiology Services, NHS Blood and Transplant, London, UK, and ⁴Division of Infection and Immunity, University College London, London, UK

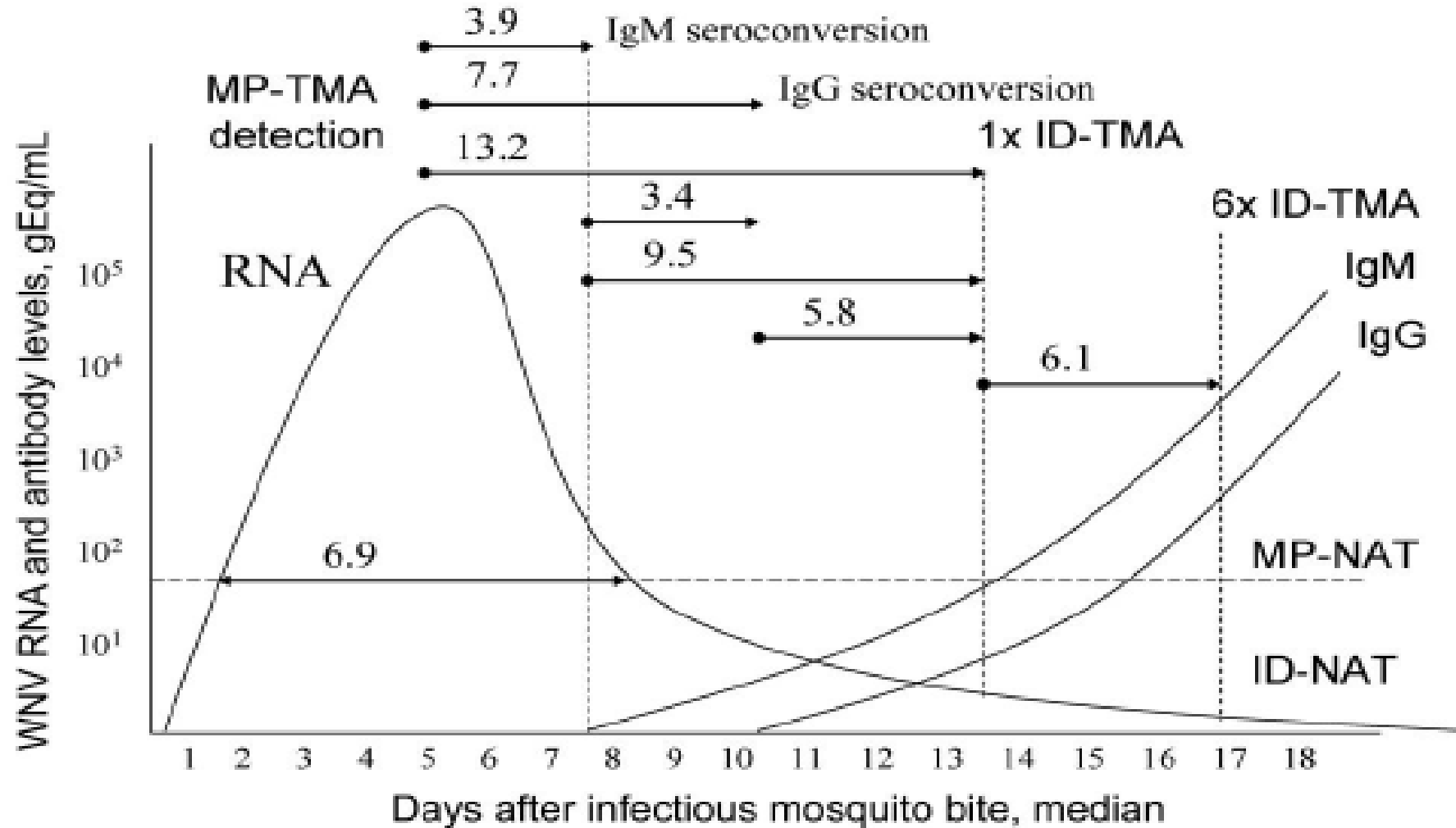
Transfus Med. 2018,
6:420-6. doi: 10.1111/tme.12561.



Virus and Antibody Dynamics in Acute West Nile Virus Infection

The Journal of Infectious Diseases 2008; 198:984–93

Michael P. Busch,^{1,2} Steven H. Kleinman,^{1,9} Leslie H. Tobler,¹ Hany T. Kamel,⁵ Philip J. Norris,^{1,2} Irina Walsh,¹ Jose L. Matud,³ Harry E. Prince,³ Robert S. Lanciotti,⁷ David J. Wright,⁹ Jeffrey M. Linnen,⁴ and Sally Caglioti⁶



NAT-WNV

X

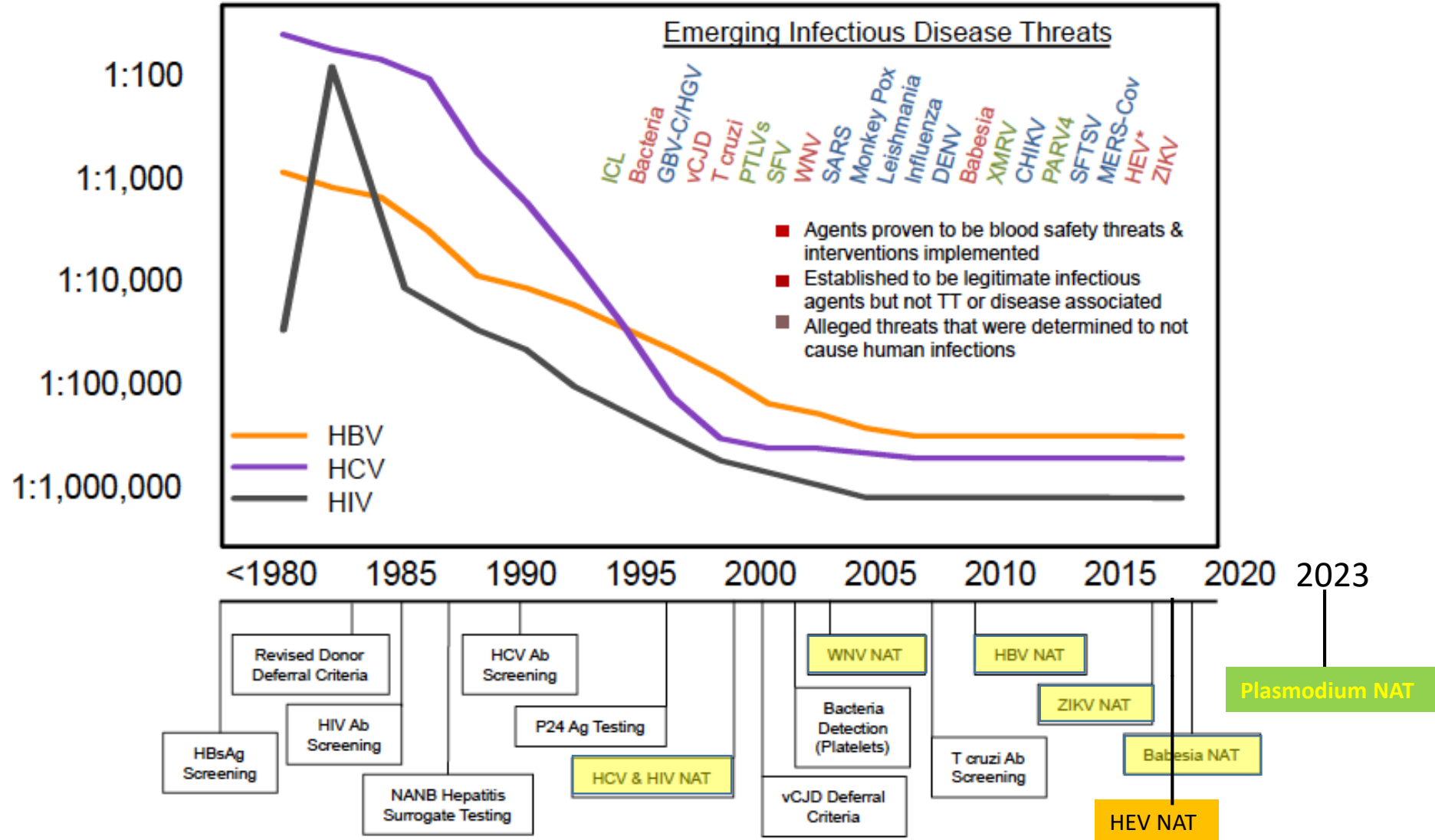
NAT-HCV/HIV

Results

Overall, 944 confirmed West Nile viremic donors (0.02%) were identified by NAT screening among 4,585,573 donations from July 1 to October 31, 2003, at

RESULTS: During the 10-year period approximately 66 million donations were screened with 32 HIV (1:2 million) and 244 HCV (1:270,000) NAT yield donations identified. HCV prevalence among FT donors

Risks of major transfusion-transmitted viral infections and emerging infectious agents of concern to blood safety



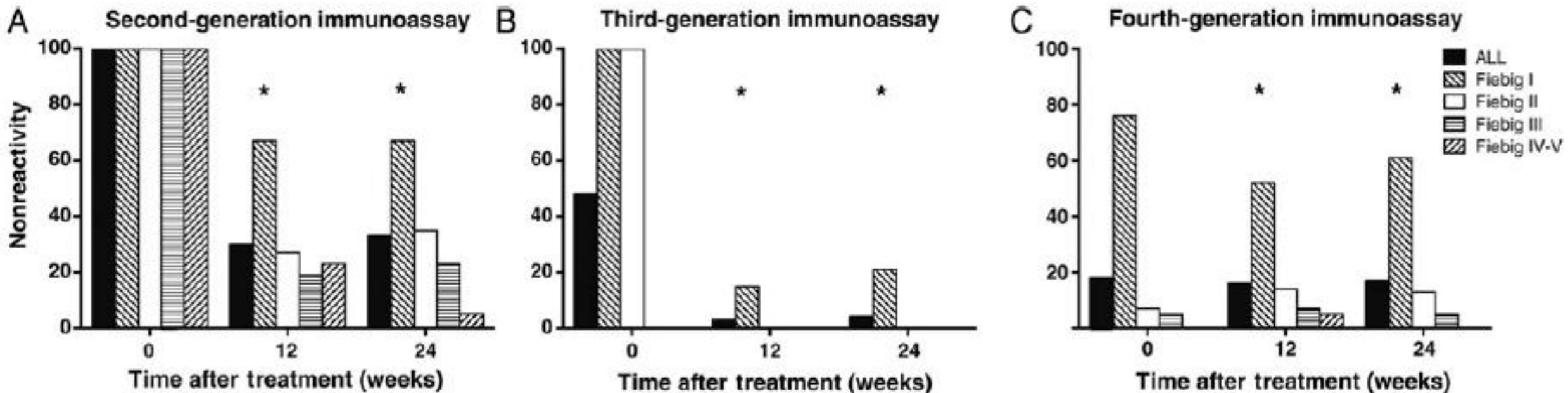


COVID NAT LAB
DASA + MINISTERIO DE SALUD BRASIL
3 MILLIONES DE RT-PCR SARS-CoV-2

NUEVO RETO - DONANTES HIV+ y TERAPIA PRE/POS EXPOSICIÓN

Initiation of Antiretroviral Therapy During Acute HIV-1 Infection Leads to a High Rate of Nonreactive HIV Serology

Clinical Infectious Diseases[®] 2016;63(4):555-61



NUEVO RETO - DONANTES HIV+ y TERAPIA PRE/POS EXPOSICIÓN

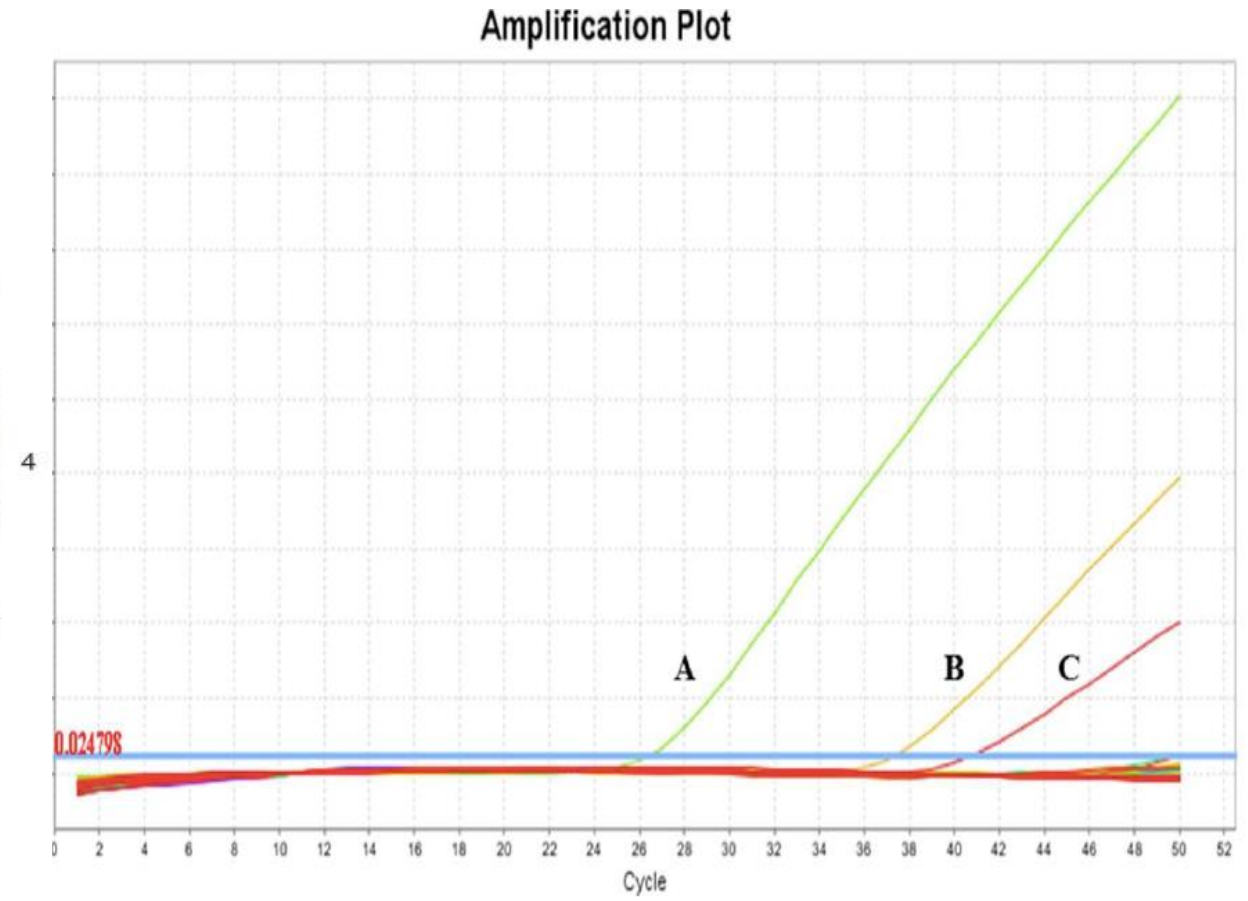
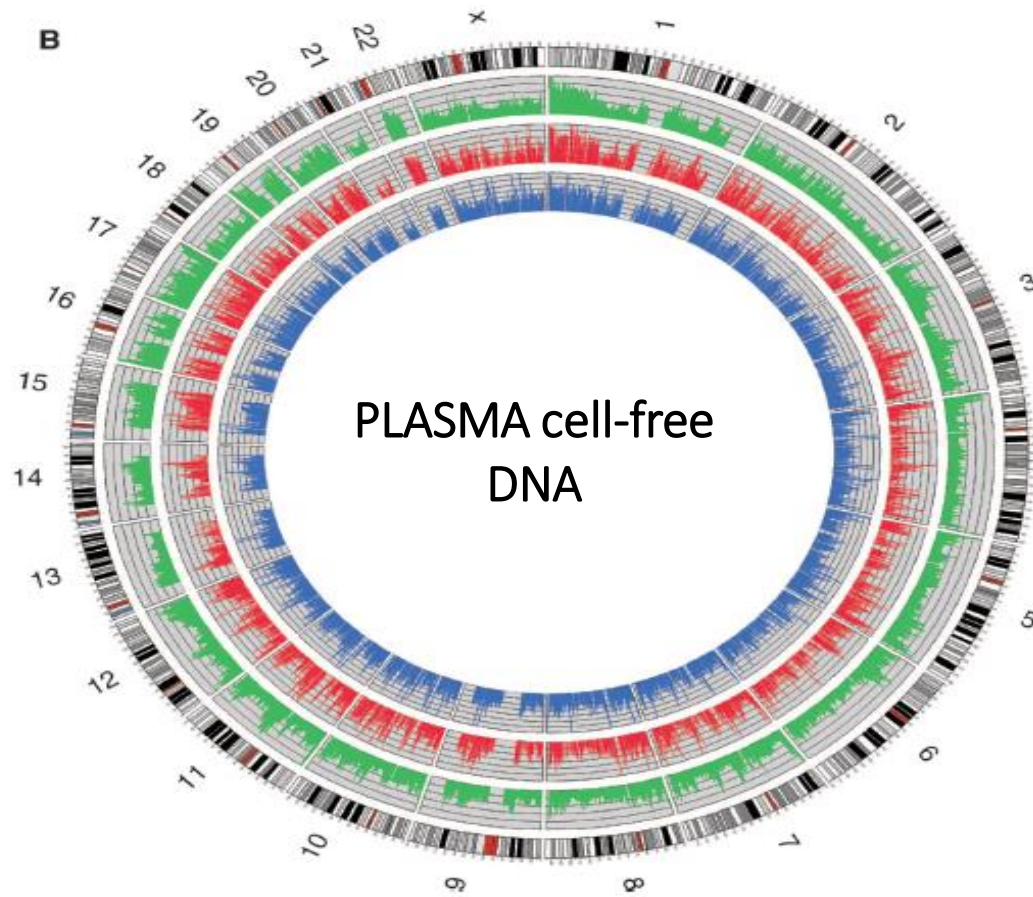
Influence of unreported HIV prophylaxis on the kinetics of post-blood donation HIV seroconversion *Transfusion.* 2021;1-5.

Donor	Time (days)	CMIA serology ^a	Pooled qualitative RT-PCR	Individual qualitative RT-PCR	Quantitative RT-PCR ^b
One	Index	Negative	Borderline	Positive	<10
	48	Negative	ND	Negative	Negative
	70	1.13	ND	Negative	Negative
	105	35.4	ND	Positive	151
Two	Index	Negative	Positive	Positive	4774
	6	Negative	ND	ND	6080
	25	Positive	ND	Positive	ND

High-throughput strategy for molecular identification of Vel- blood donors employing nucleic acids extracted from plasma pools used for viral nucleic acid test screening

TRANSFUSION 2016;56:1430–1434

Marcia R. Dezan, Carla L. Dinardo, Silvia R.A. Bosi, Sileni Vega,
Nanci A. Salles, Alfredo Mendrone-Júnior, and José E. Levi



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- 3.MULTIPLEX

VAH/VBH/VCH/VEH/VIH



La prueba ideal

*La prueba ideal debe tener una **sensibilidad y especificidad del 100%**, además de separar a los donantes que están en riesgo de transmisión por la donación de sangre de los que no lo están.*



12

Congreso Colombiano **Acobasmet**
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Transfusional
Congreso Iberoamericano **GCIAMT**

*Nuevamente juntos, innovando
para fortalecer capacidades*



MUCHAS GRACIAS!
dudilevi@usp.br



Join us next year at ISBT Gothenburg 2023!



ISBT Gothenburg 2023

June 17 - 21, 2023

Gothenburg, Sweden

**Registration and Abstract submission
opening in January 2023**