

10-year survey of NAT

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On behalf of the Virology and SRAP subgroups of
the ISBT TTID WP

Disclosures:

I have no disclosures

Blood donation NAT

- Nucleic acid amplification testing (NAT) - detection of nucleic acid sequence
- Blood donation NAT for transfusion transmitted infectious diseases (TTIDs)
 - Additional layer of blood safety
 - Human immunodeficiency virus (HIV)
 - Hepatitis C virus (HCV)
 - Hepatitis B virus (HBV)
 - Hepatitis E virus (HEV)
 - West Nile virus (WNV)
 - Zika virus (ZIKV)
- Tracking distribution and prevalence of TTIDs over time within the blood donor population

Rationale for current study

- Increased adoption of blood donation NAT globally¹⁻³
- Previous NAT survey by Roth *et al*³
 - Increased routine NAT usage
 - Data from donations collected during 2008 calendar year
- Updated understanding of utility and safety benefits of NAT
 - Improvements in testing chemistry
 - Advances in infectious disease molecular surveillance
 - Expansion of emerging TTIDs

1. Engelfriet CP. Vox Sang 2002; 82:87–111
2. Coste J, *et al*. Vox Sang 2005; 88(4):289–303
3. Roth WK, *et al*. Vox Sang 2012; 102(1):82-90

Project aims and scope

- **Aim: To undertake a comprehensive survey of NAT usage and yield globally**
 - Blood donations collected during the 2019 calendar year
 - Based on previous survey¹ to allow trends over time to be captured

Methods

- **Online survey (also fillable PDF/word) - Qualtrics**
 - Questions based on those from previous NAT survey¹
 - General: 8; HIV: 19; HCV: 23; HBV: 20; HEV: 17; WNV: 17; ZIKV: 17; Other: 2
 - Data collection period: January – December 2019
 - Circulated: 13/05/2021; First reminder: 13/10/2021; Second reminder: 07/02/2022
 - Publicised during ISBT congress in June 2022
 - Personal emails to ISBT TTID WP members in August 2022
 - Roche & Grifols: encourage participation by customers
- **Descriptive analysis (responses received as of 4/19/23)**
 - Based on proportion of survey responses

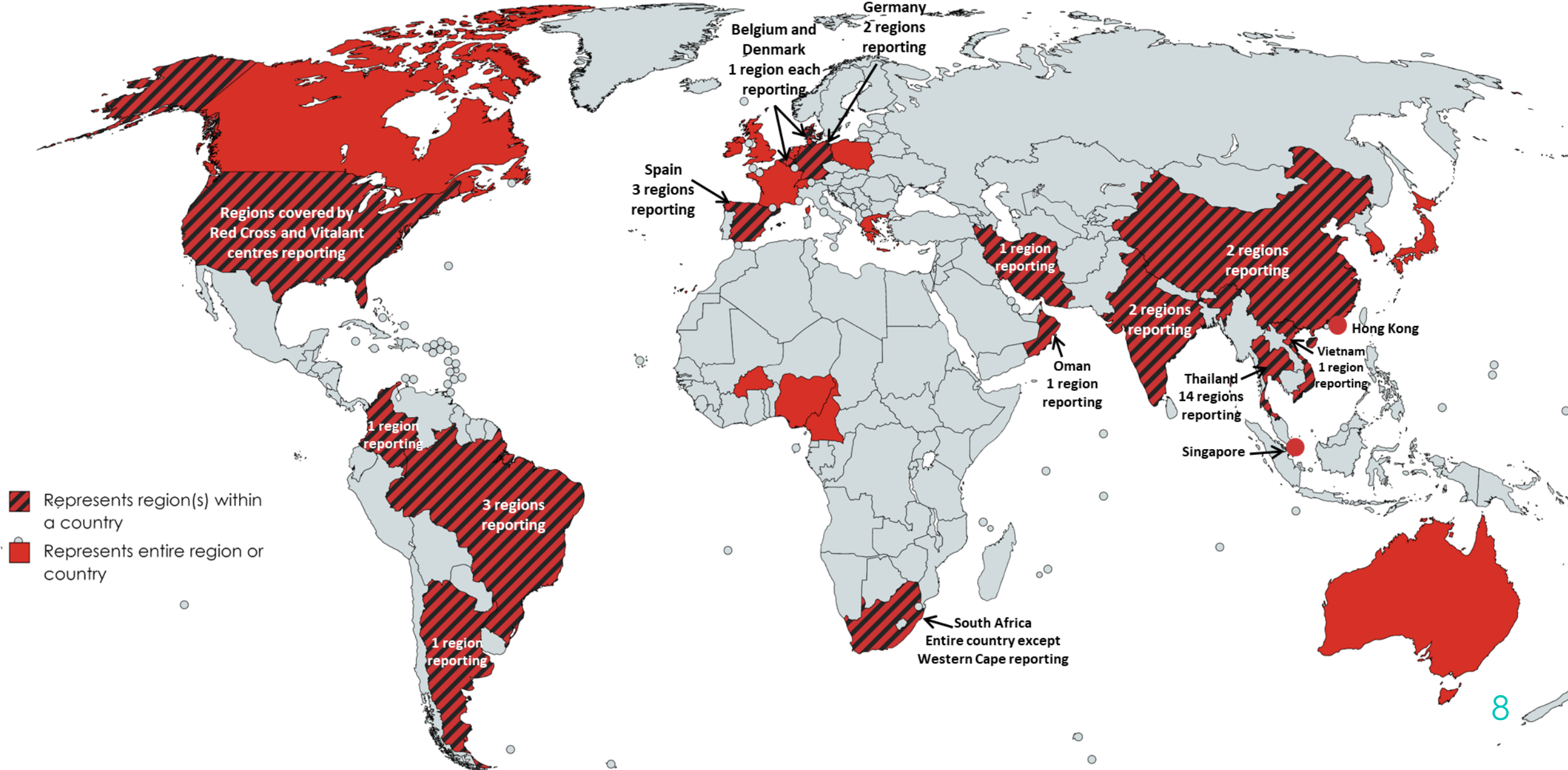
Responses

As of 4/19/2023, 41 responses from 31 different countries

Argentina, Australia, Belgium, Brazil (3 regions), Burkina Faso, Cameroon, Canada (2 regions), China (2 regions), Columbia, Denmark, France, Germany (2 regions), Greece, Hong Kong, India (3 regions), Iran, Ireland, Japan, Netherlands, Nigeria, Oman, Poland, Republic of Korea, Singapore, South Africa, Spain (3 regions), Switzerland, Thailand, UK (3 regions), USA, Vietnam

Thijs van de Laar, Claire Styles, Phil Kiely, Angelo Margaritis, So-Yong Kwon, Yan QIU, Xuelian Deng, Antoine Lewin, Signe Winther Jørgensen, Christian Erikstrup, David Juhl, Konstantinos Stamoulis, Silvia Saulea, Bernardo Armando Camacho Rodriguez, Wai-Chiu Tsoi, Sineenart Oota, Sheila O'Brien, Silvano Wendel, Roberta Fachini, Emma Castro, Laura Navarro, Heli Harvala, Katy Davison, Claire Reynolds, Lisa Jarvis, Piotr Grabarczyk, Aneta Kopacz, Dorota Kubicka-Russel, Magdalena Łętowska, Fiona Young, Sze Sze Chua, Jeslyn Tan, Diana Teo, An Muylaert, Isabel Herrauz, Ana Jimenez de Bianco, Lydia Blanco, Ratti Ram Sharma, Susan Stramer, Brian Custer, Ann Jones, Christoph Niederhauser, Marion Vermeulen, Syria Laperche, Pierre Gallian, Opeyemi Lufeyisol, Salam Sawadog, Masahiro Satake, Ahmad Gharehbag, Marcelo Addas-Carvalho, Sebastian Blanco-Sandra Gallego, Pankaj Shrivastava, Axel Seltsam, Arwa Al-Riyami, Khuloud Al Maamari, Fatma Ba Alawi, Hem Chandra Pandey, Doora Mbanya, Rochele Azevedo Franca

Survey responder regions/countries



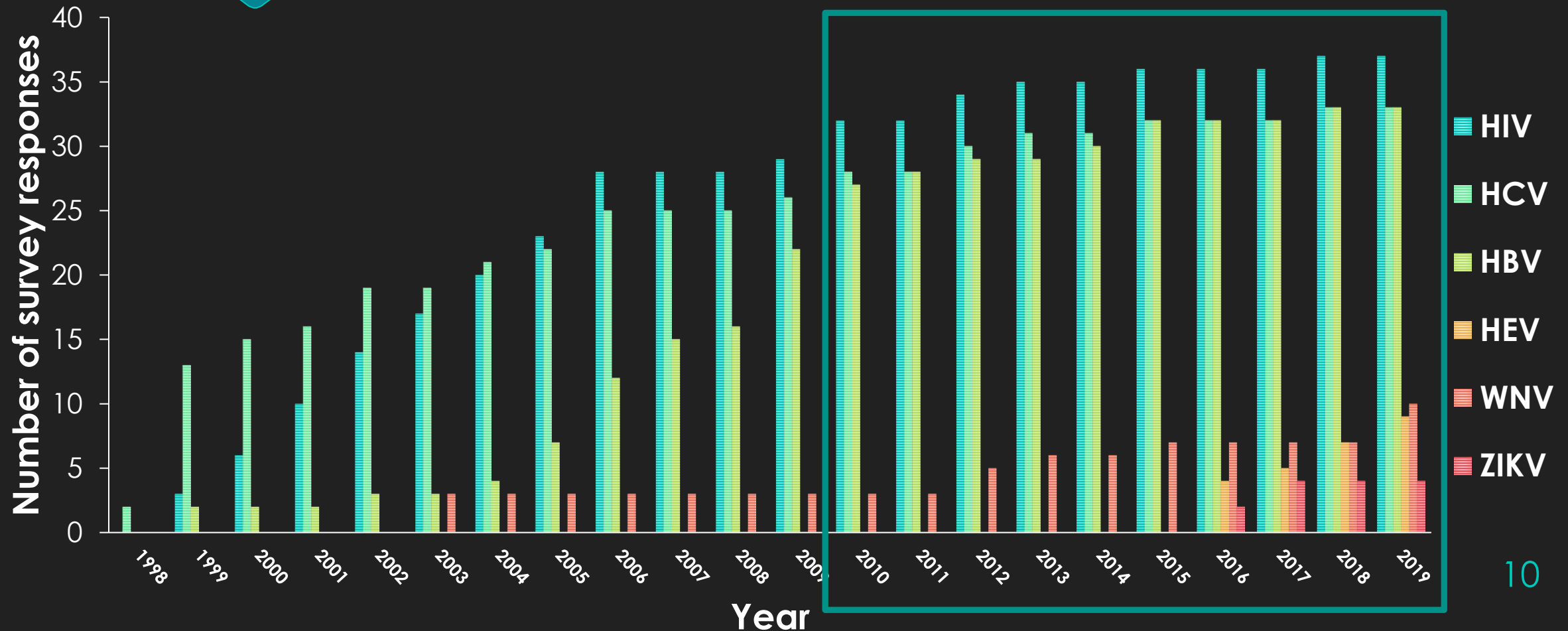
NAT usage

Number of countries/regions performing NAT of blood donations during 2019

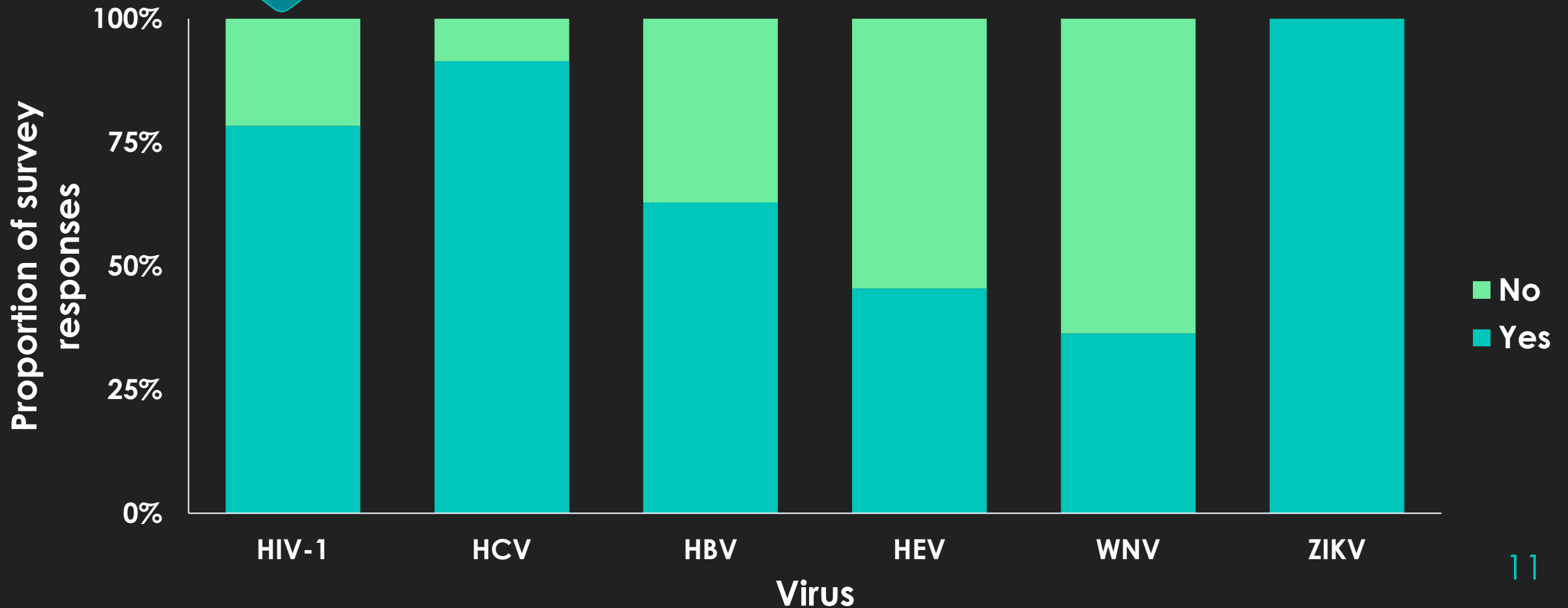
	HIV-1	HCV	HBV	HEV	WNV	ZIKV
Yes	37	35	35	11	11	4
No	4	4	4	28	28	35
No response	0	2	2	2	2	2

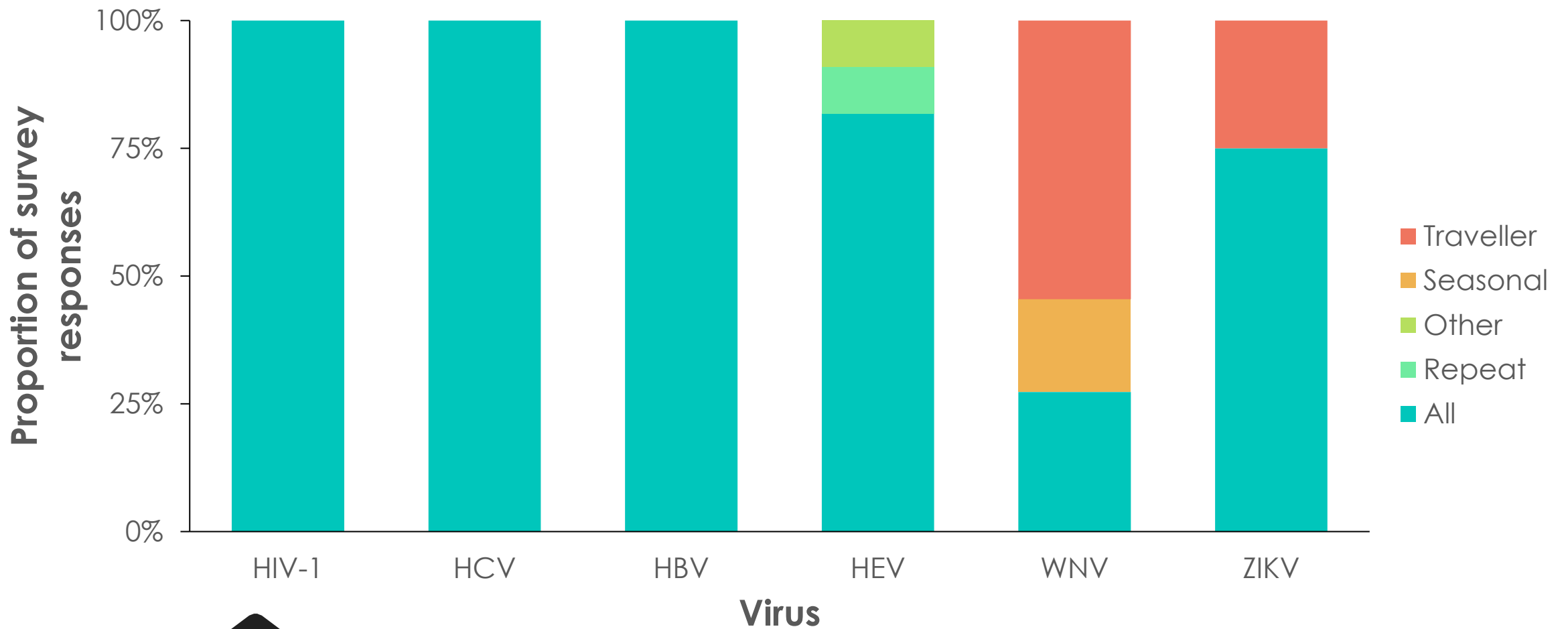
- 4 responders did not perform NAT for any virus (economic reasons)
- 37/41 responses from a country/region performing NAT for at least one virus
 - ~29 million donations (HIV testing), covering population of over 1 billion people
- Commercial assays – predominantly Grifols or Roche (no in-house testing)

Implementation year of each test



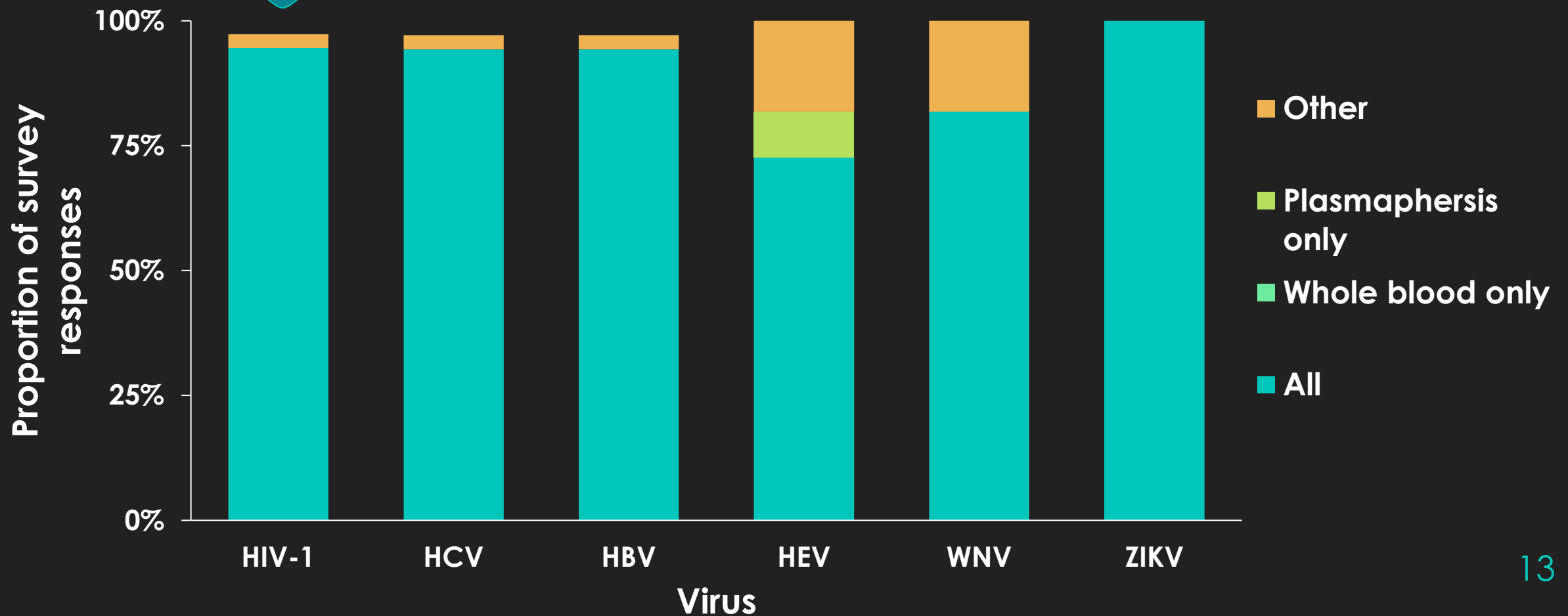
Government mandated NAT



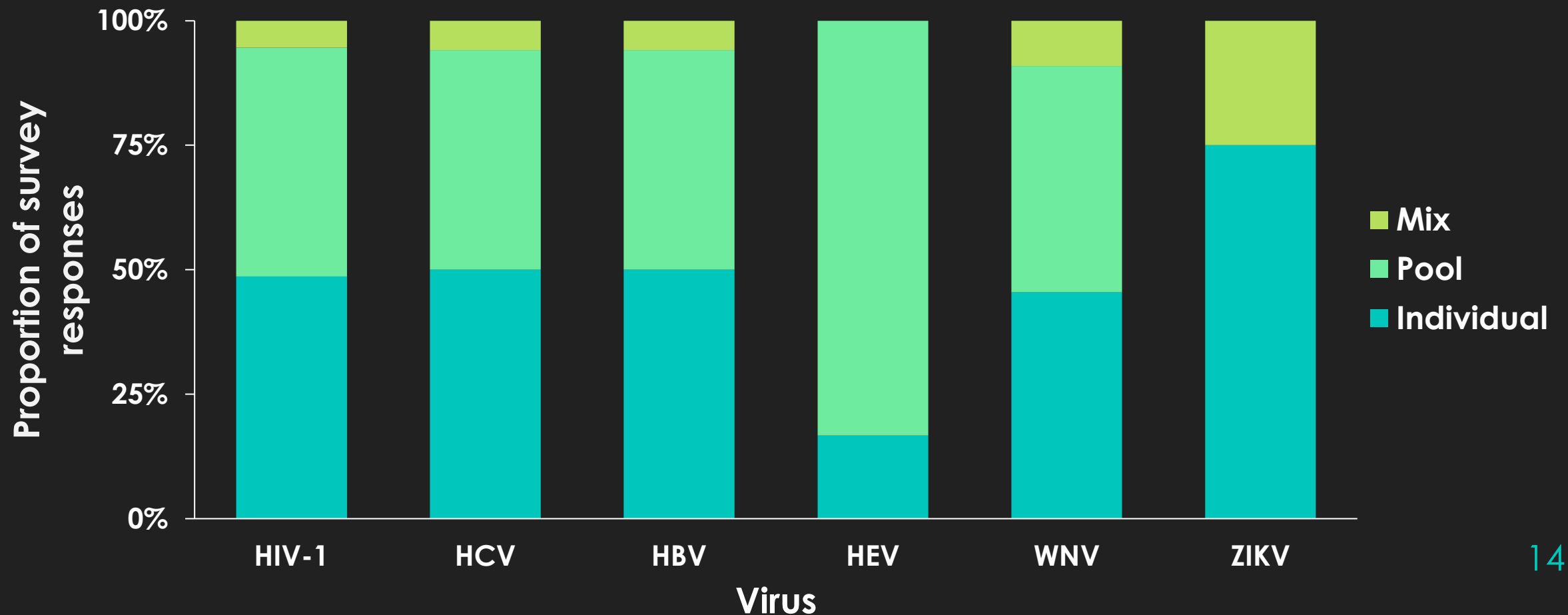


Donor type

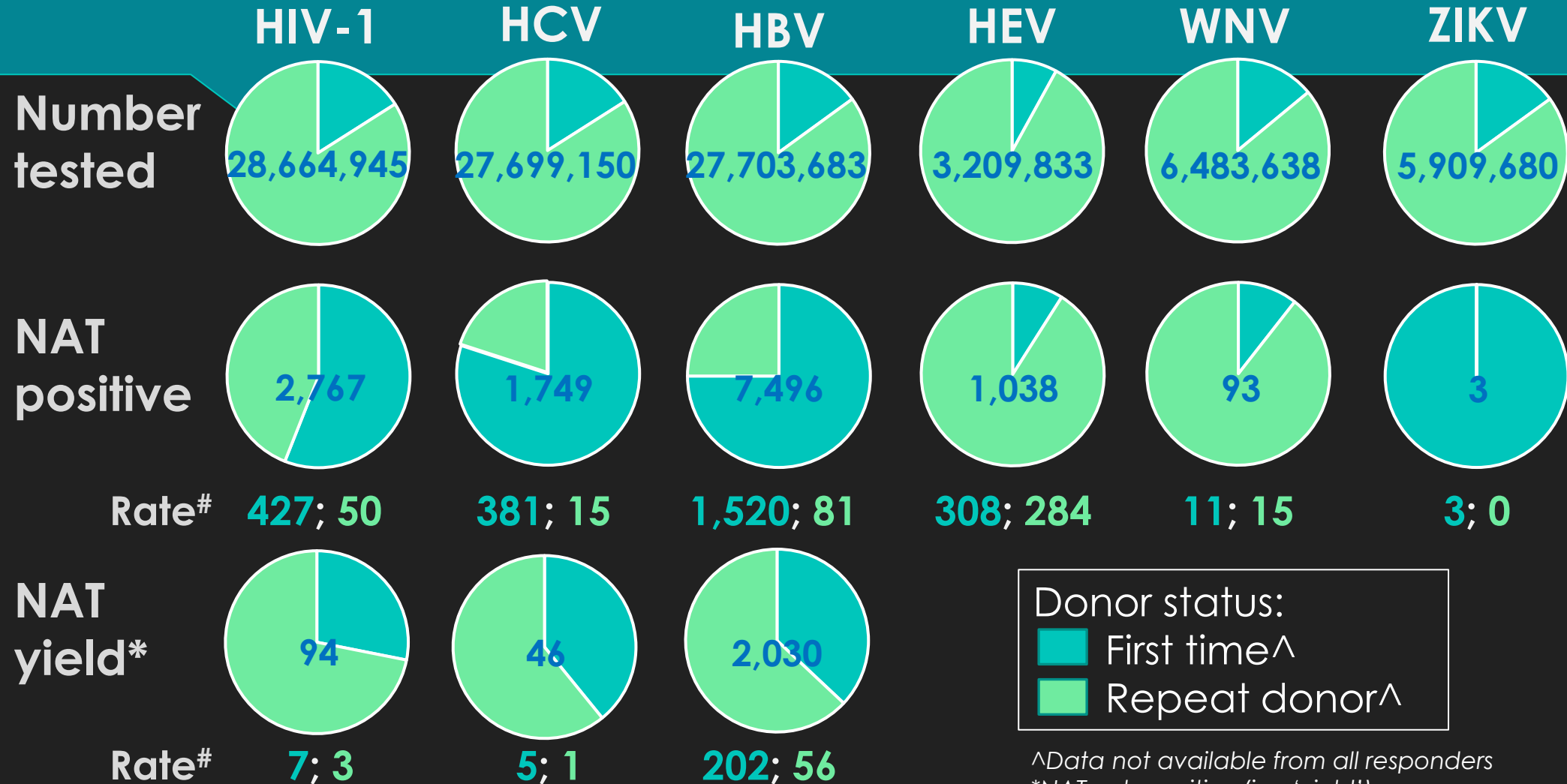
Donation type



Testing characteristics



NAT positive blood donations, 2019^



Donor status:
 First time^
 Repeat donor^

^Data not available from all responders
 *NAT only positive (i.e. 'yield')
 # per 1 million donations

	HIV-1	HCV	HBV	HEV	WNV	ZIKV
No. tested	517,547,384	540,392,660	370,188,565	7,721,980	140,202,921	19,301,071
NAT positive	32,914	74,945	67,895	1,763	3,143	589
First time^	61%	80%	75%	91%	13%	14%
Repeat^	39%	20%	25%	9%	87%	86%
NAT yield*	1,155	1,121	14,376	-	-	-
First time^	24%	36%	29%	-	-	-
Repeat^	76%	64%	71%	-	-	-

**NAT only positive*

^Data not available from all responders

**NAT positive blood donations,
implementation to 2019**

Conclusions

■ Increased NAT usage since 2010

- HIV/HCV/HBV (small increase); WNV (travellers); HEV/ZIKV (new introduction)
- HIV/HCV/HBV (all donors/donations); WNV/HEV/ZIKV (selected testing)
- No in-house NAT; individual NAT/ smaller pools for HIV/HBV/HCV

■ NAT positive donations identified for all viruses tested

- HIV/HCV/HBV: NAT positive and NAT yield rate ↑ in first time donors
- WNV: NAT positive rate ↑ in repeat donors

Acknowledgements

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Thank you!

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