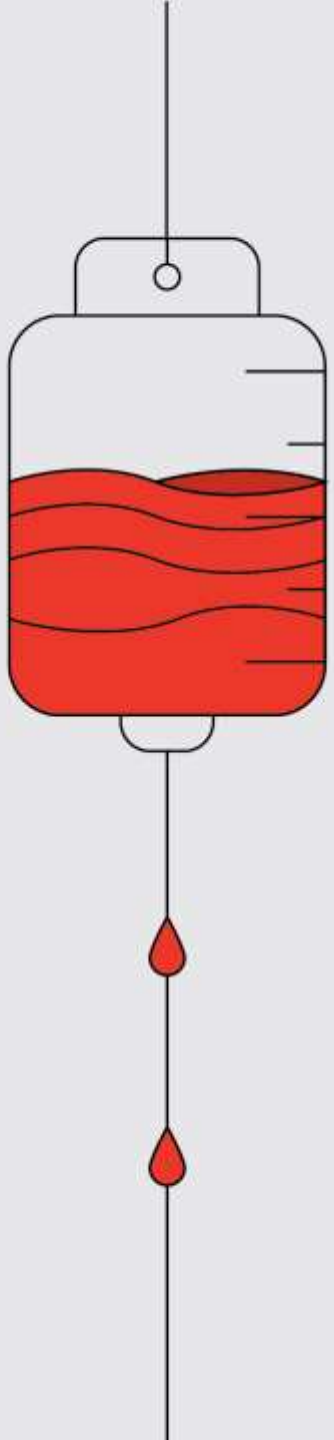


IPFA – Aarhus, Denmark

15th and 16th May 2024

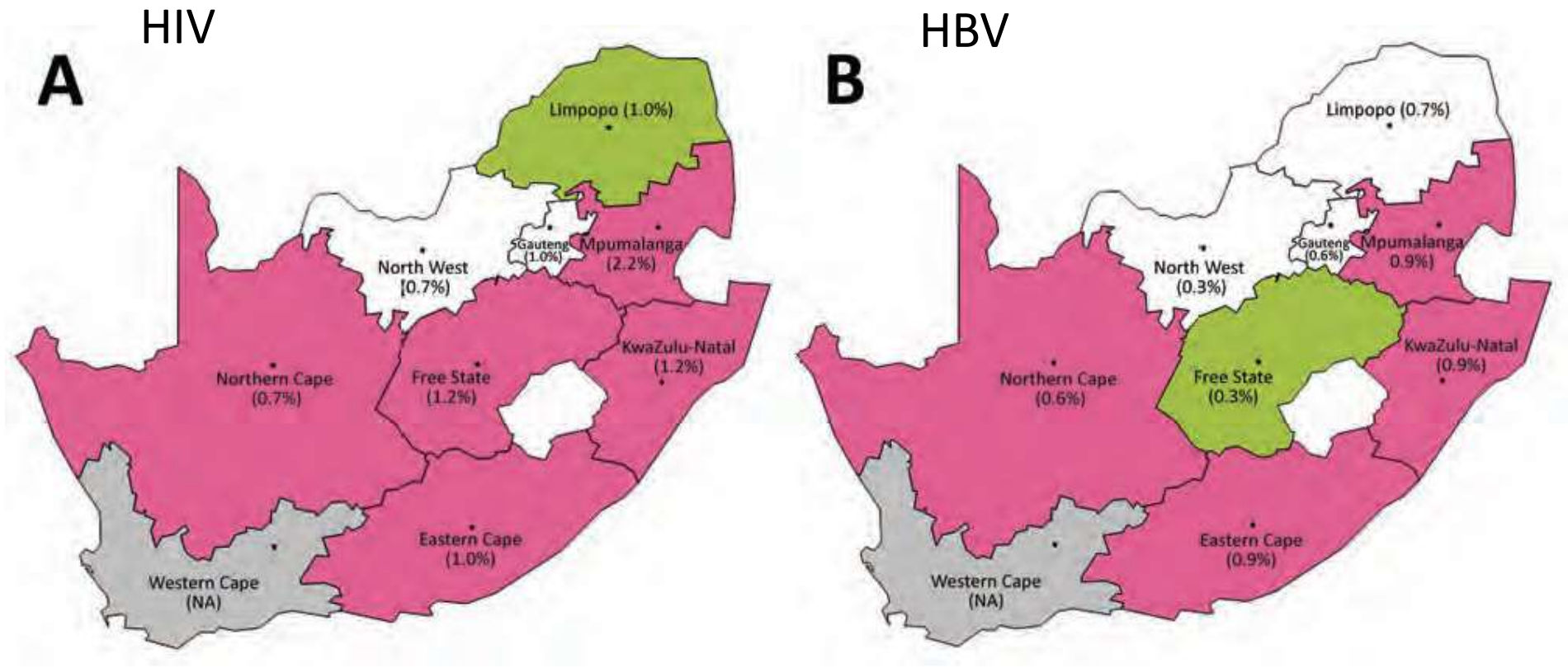
Recent HCV experience in South Africa

Marion Vermeulen

SANBS

Background

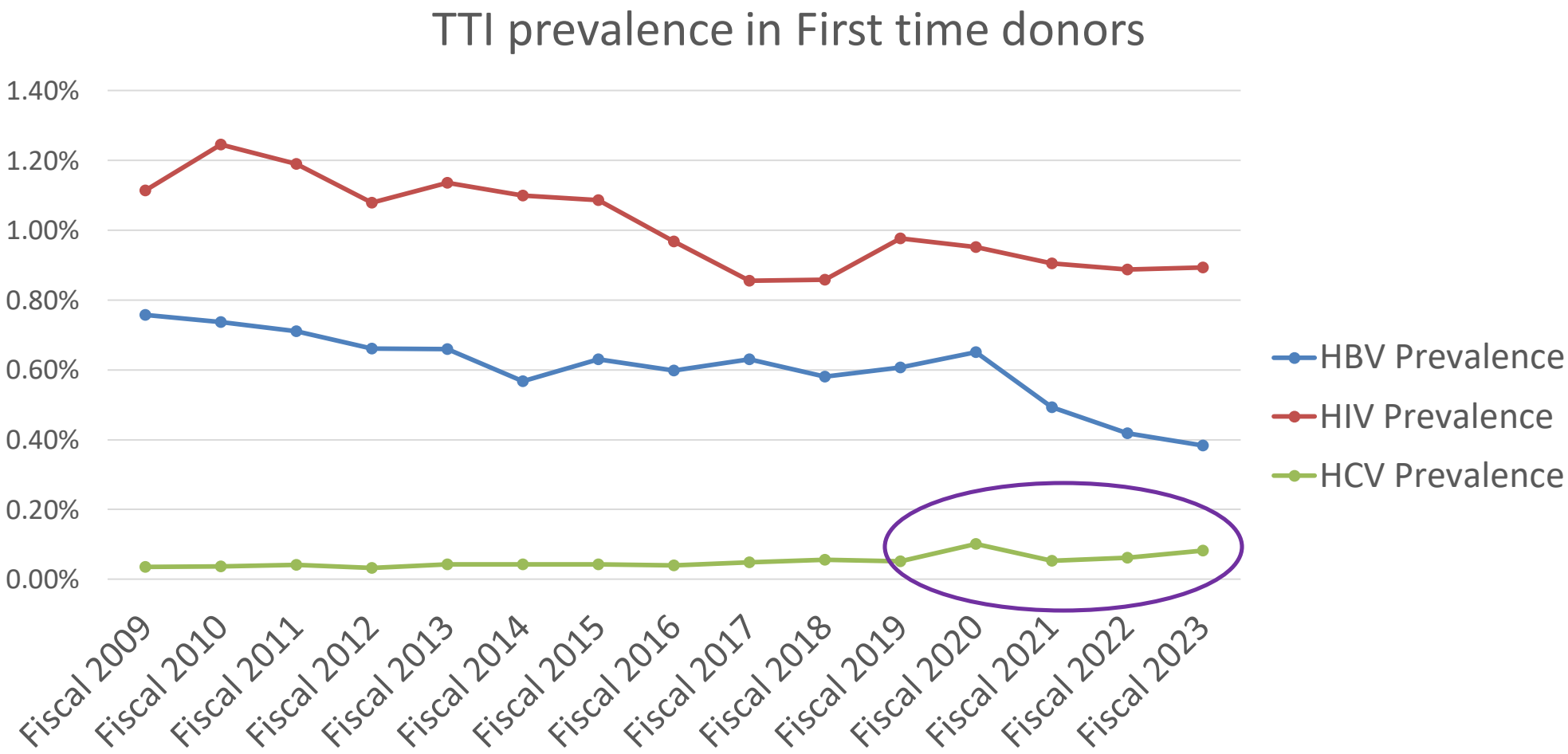
- South Africa is a high endemic country for HIV and HBV and this is seen in the prevalence in blood donors



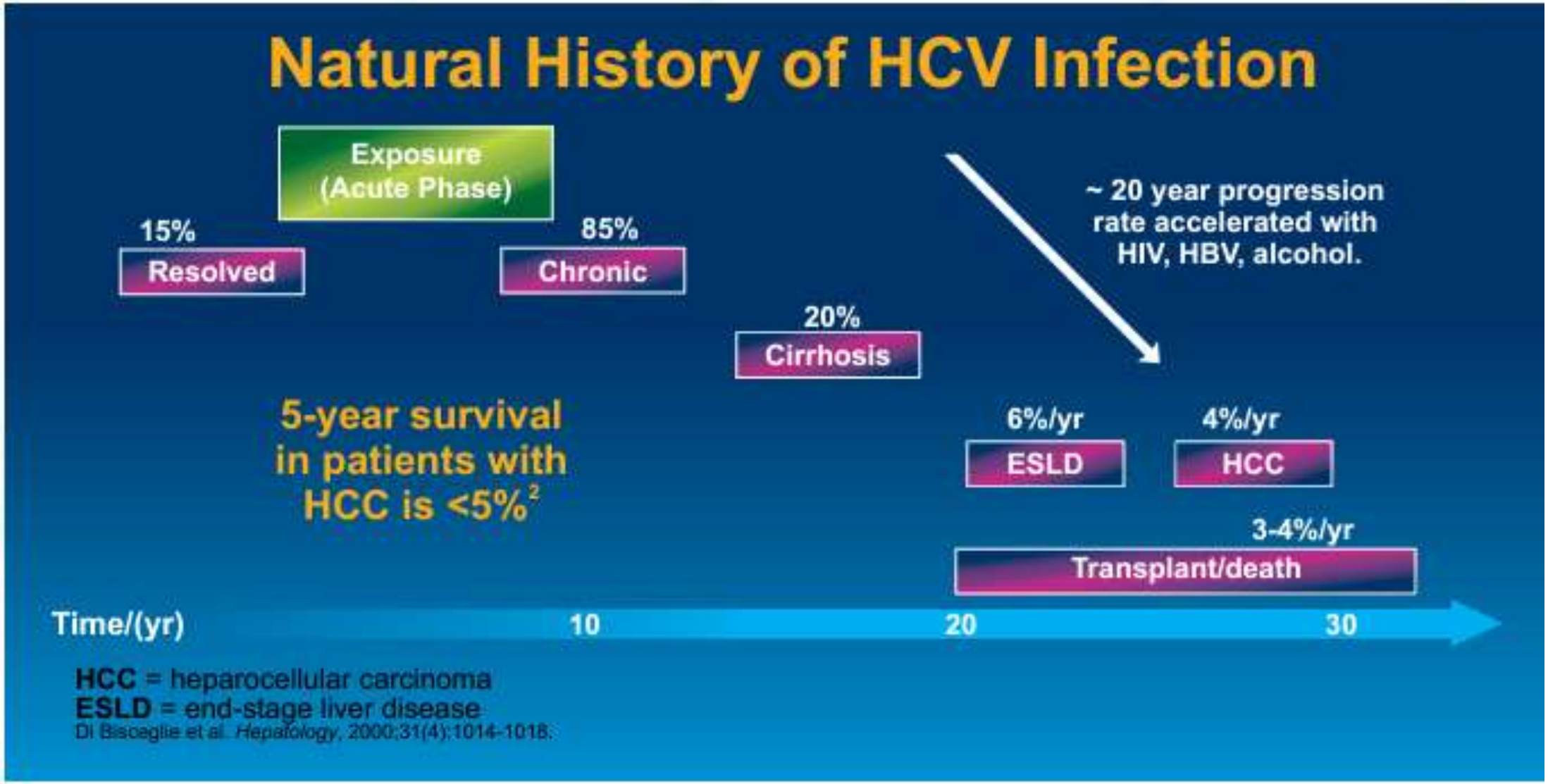
- HCV prevalence in South Africa has been historically low probably due to sanctions in the 80's and 90's

Emerging Infectious Diseases Vol. 23, No. 9, September 2017

Background


TTI prevalence in First time donors
1.40%
1.20%
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
Fiscal 2009
Fiscal 2010
Fiscal 2011
Fiscal 2012
Fiscal 2013
Fiscal 2014
Fiscal 2015
Fiscal 2016
Fiscal 2017
Fiscal 2018
Fiscal 2019
Fiscal 2020
Fiscal 2021
Fiscal 2022
Fiscal 2023
HBV Prevalence
HIV Prevalence
HCV Prevalence

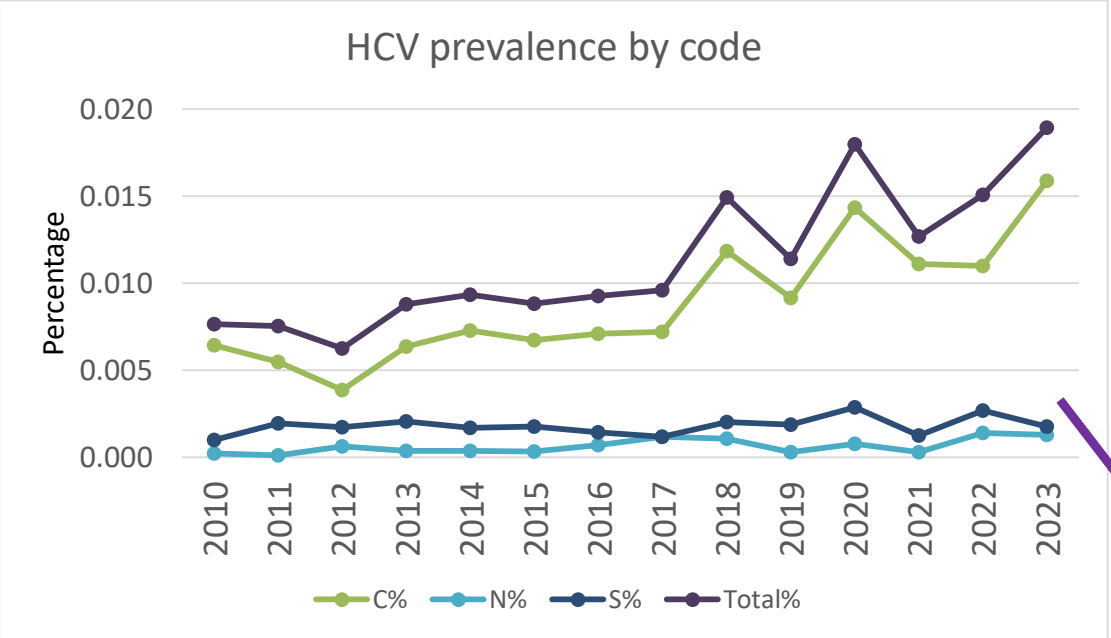
Background


Natural History of HCV Infection
Exposure (Acute Phase)
15%
Resolved
85%
Chronic
20%
Cirrhosis
~ 20 year progression rate accelerated with HIV, HBV, alcohol.
5-year survival in patients with HCC is <5%[2]
6%/yr
ESLD
4%/yr
HCC
3-4%/yr
Transplant/death
Time/(yr)
10
20
30
HCC = heparocellular carcinoma
ESLD = end-stage liver disease
Di Bisceglie et al. Hepatology. 2000;31(4):1014-1018.

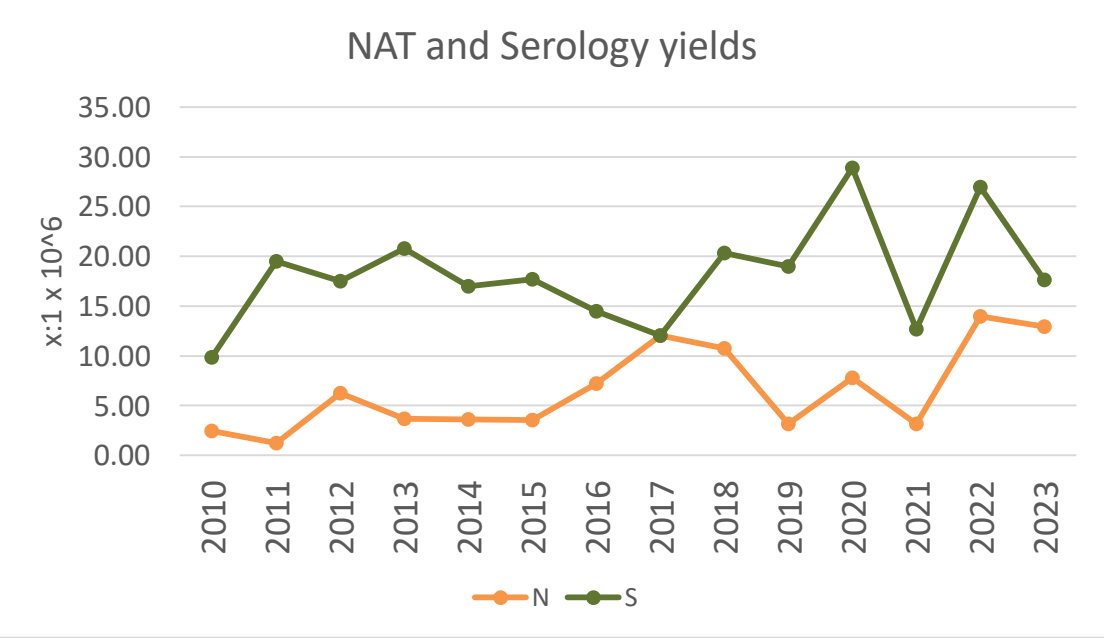
Aims

- Look at variables associated with the increase in prevalence in blood donors (2010-2023)
- Compare with the general population of people seeking medical attention (2017-2022)
- Compare with people who inject drugs (PWID) (2017-2018)
- Check genotypes over time (2005 – 2023)

Results – Test results

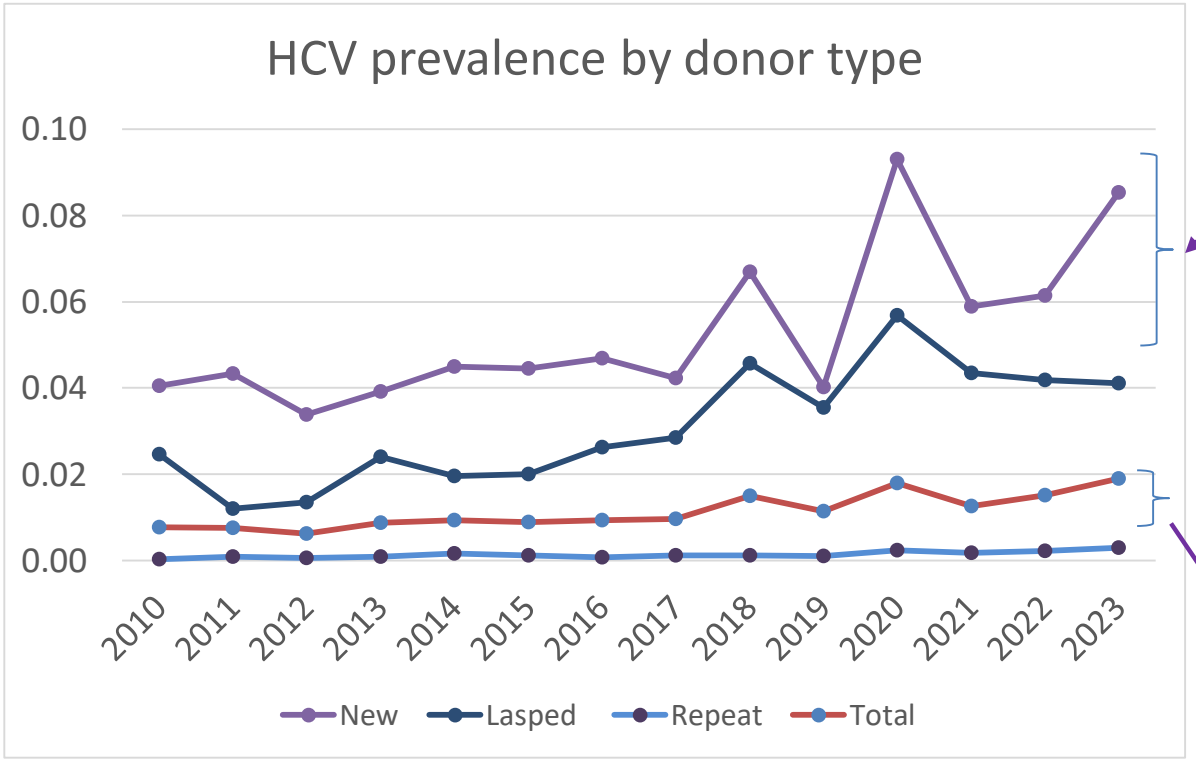


N= NAT yield
S = Serology yield
C= Concordant NAT and Serology positive

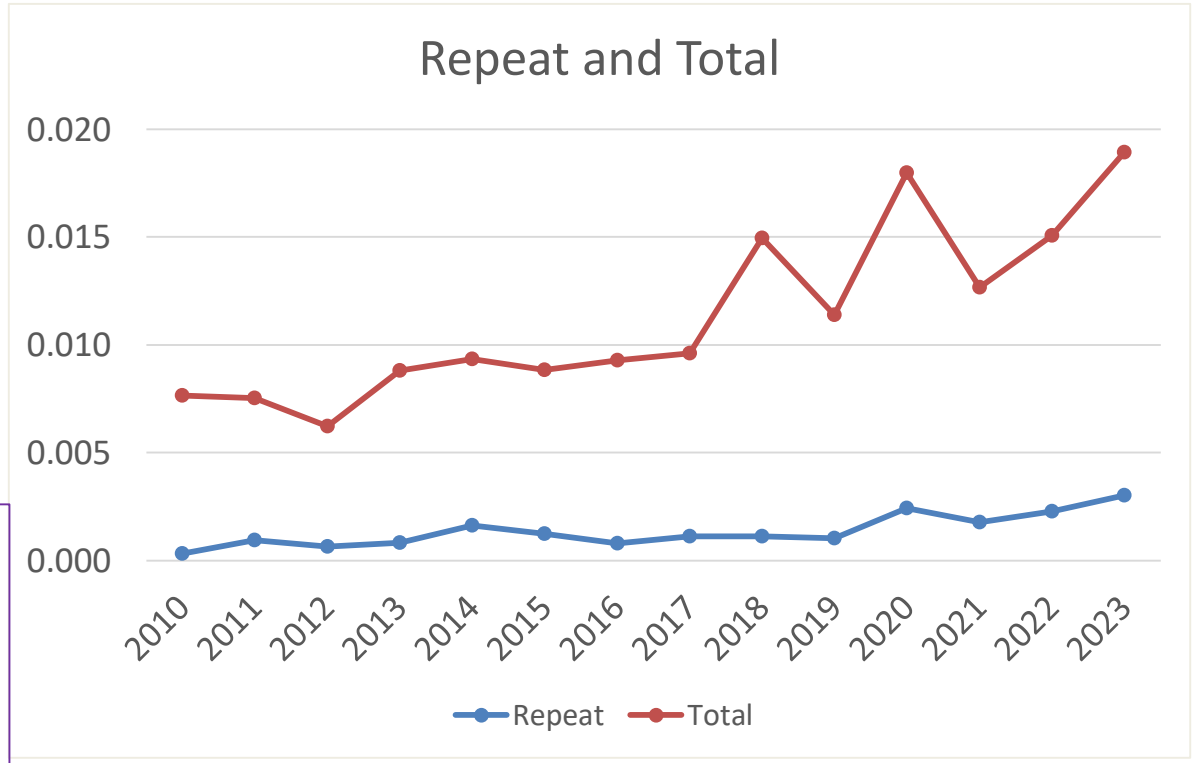


Concordant pos	p<0.001
NAT yields	p=0.01
Serology Yields	p=0.19

Results – Donor type

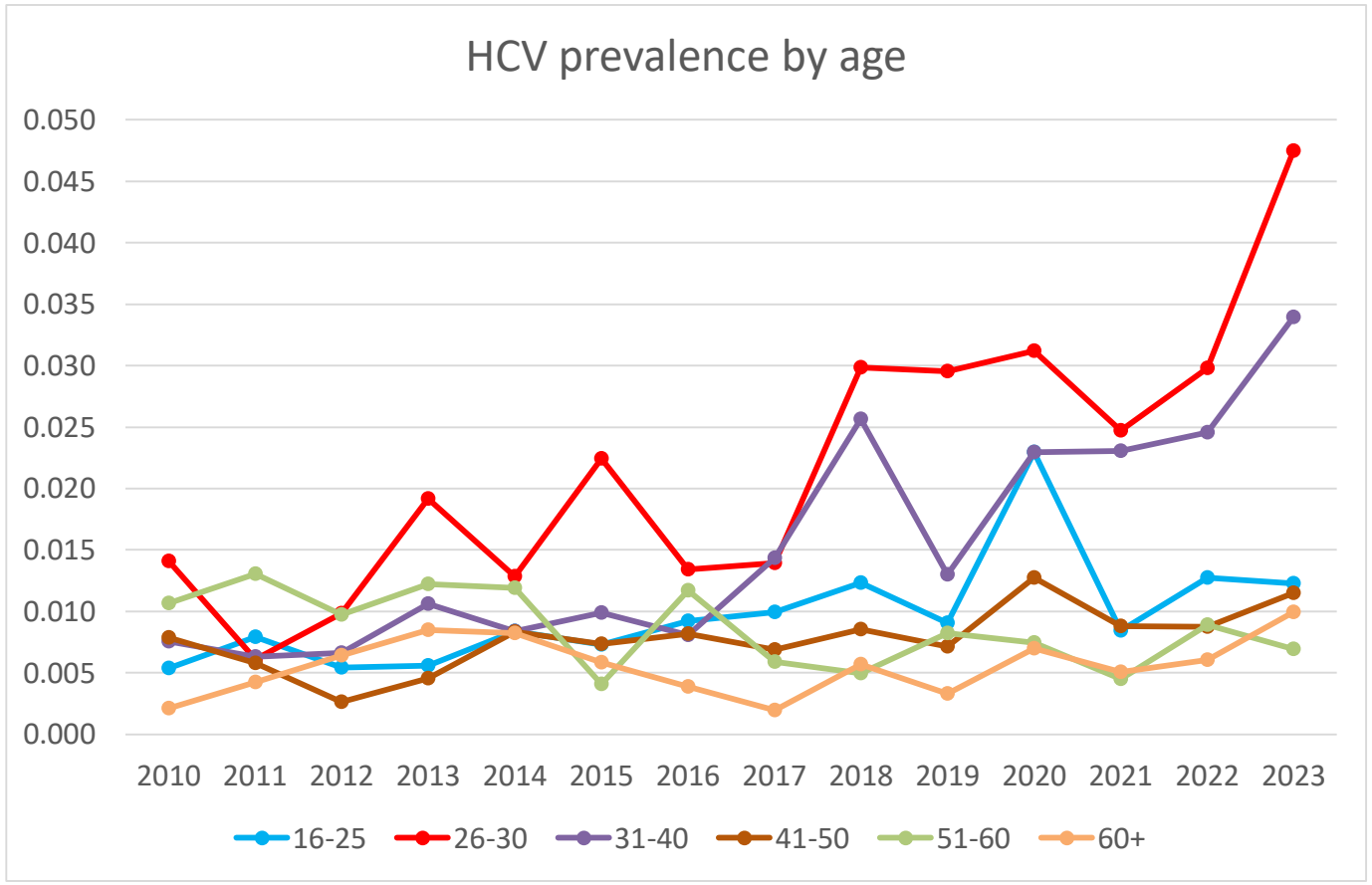


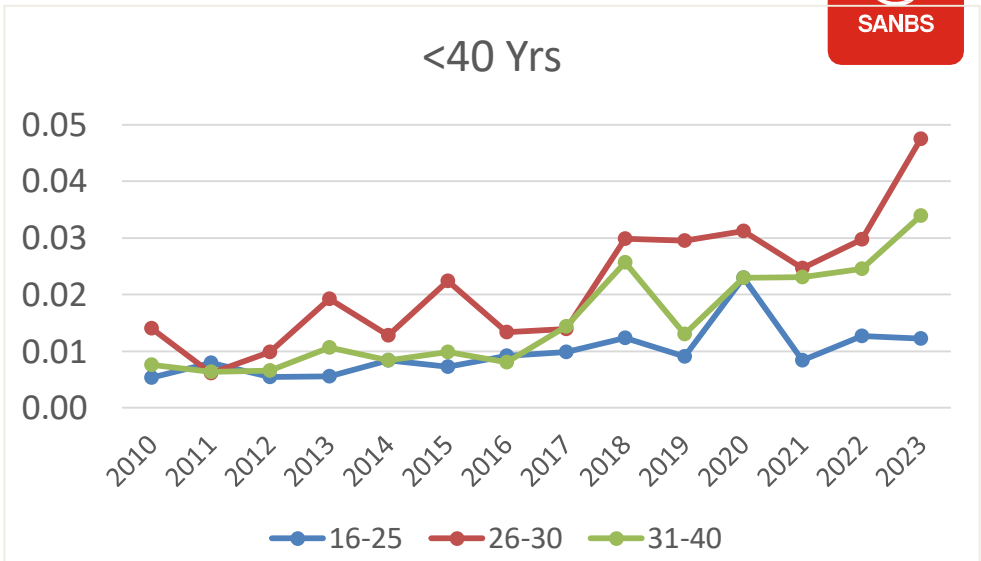
Increase looks like it is driven by First time and Lapsed donors

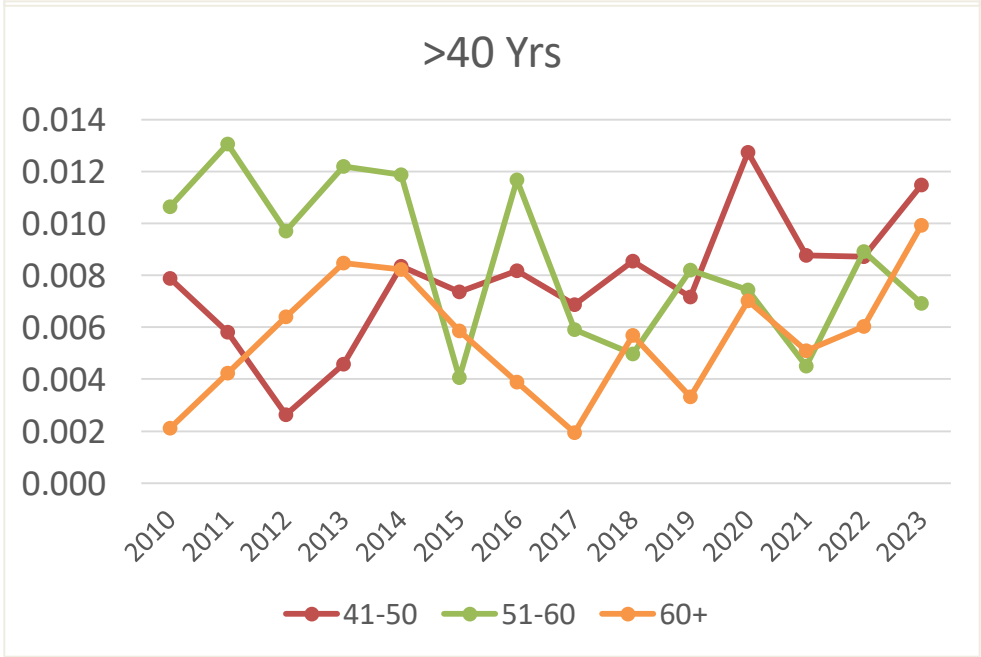


Prevalence in First time donors has doubled
0.04 – 0.085 (p=0.003)
Prevalence in Repeat donors has increased 10 fold
0.0003 – 0.003 (p<0.001)

Results - Age



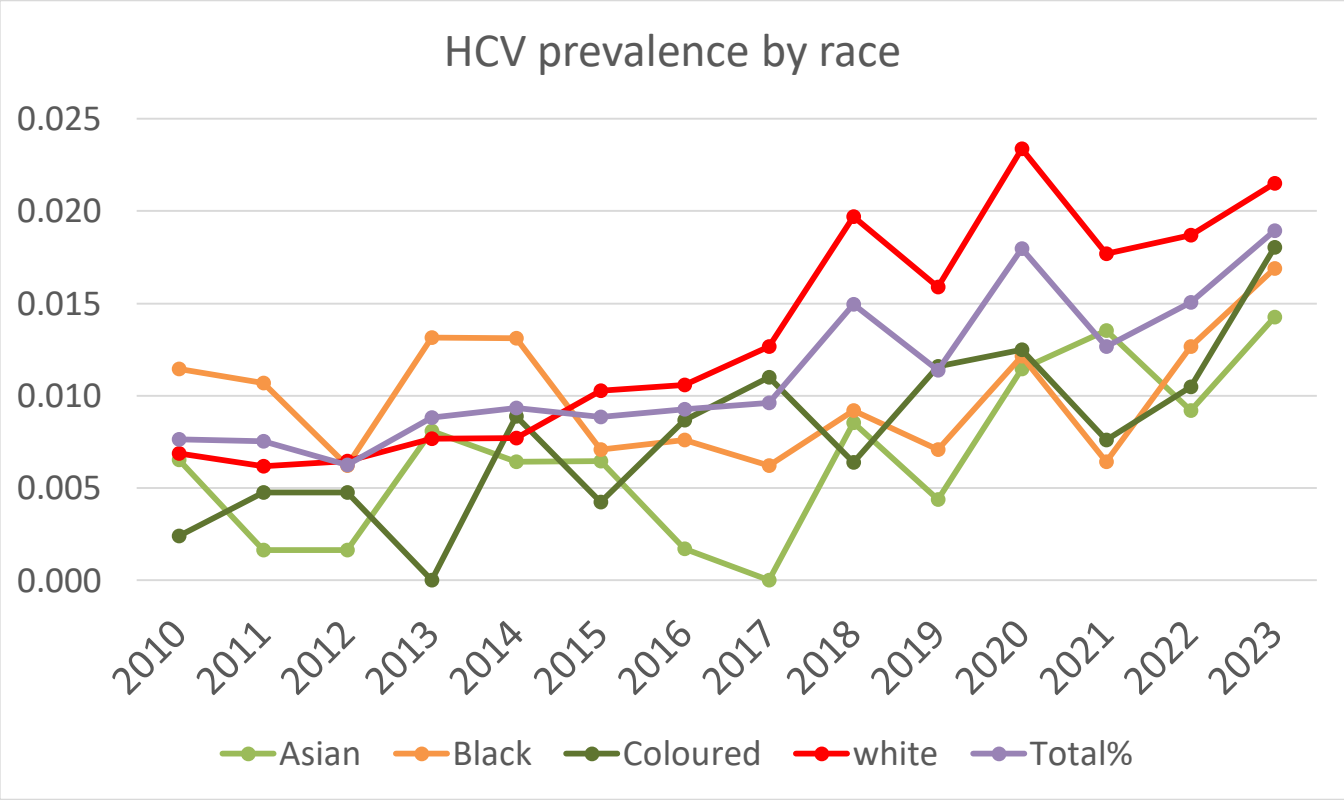


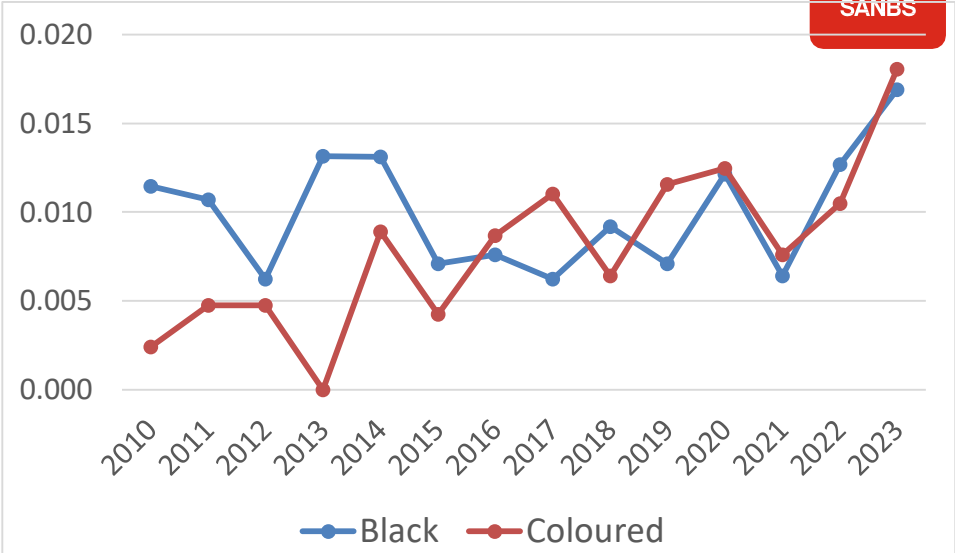


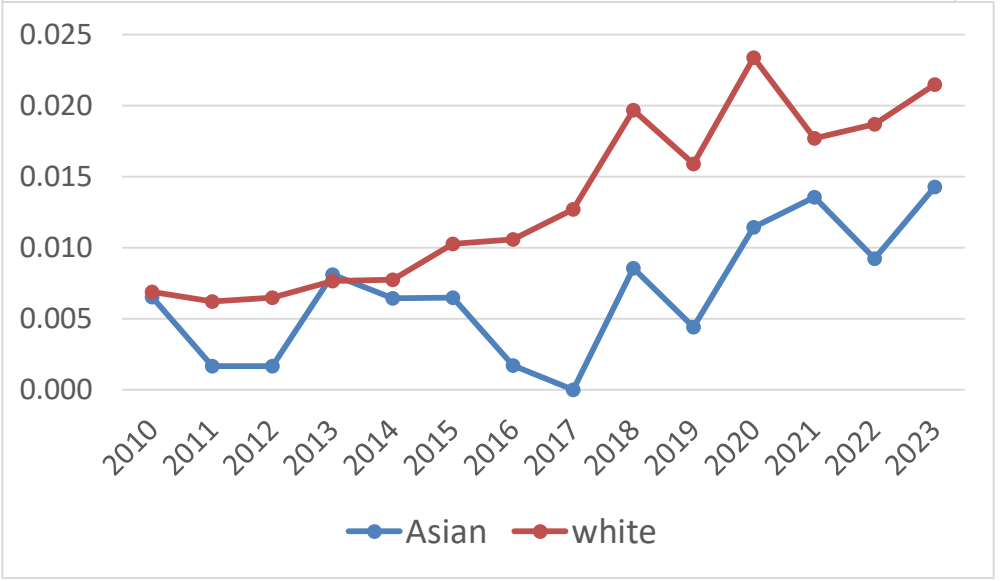
16-25 (p=0.01)
26-30 (p<0.0001)
31-40 (p<0.0001)

41-50 (p=0.007)
51-60 (p=0.02)
60+ (p=0.5)

Results- Race

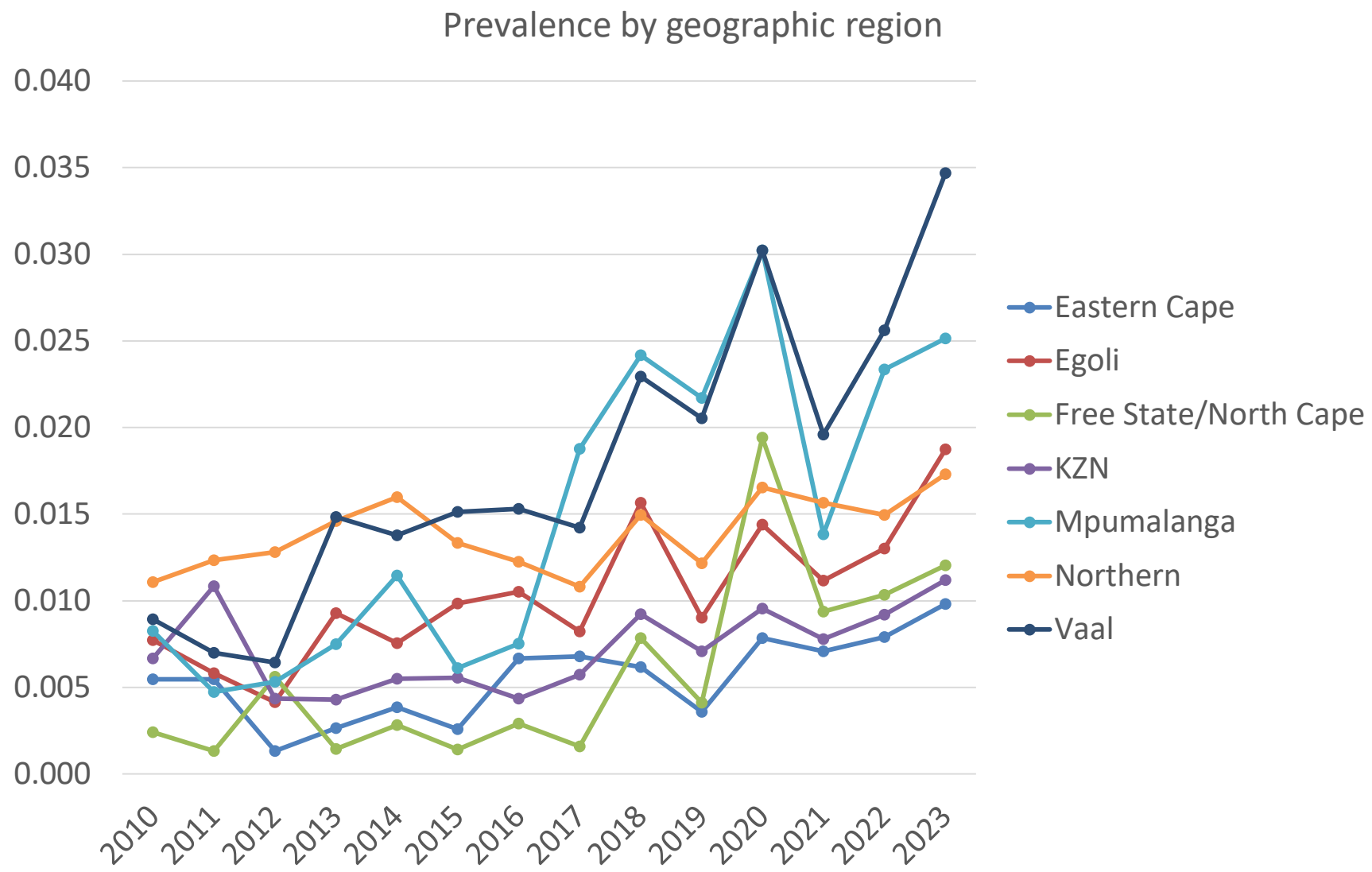






Prevalence in White donors has increased each year (p<0.0001)
Prevalence in Asian donors started increasing around 2017 (p=0.016)
Prevalence in Black donors remained stable (p=0.56)

Results – Geographic region



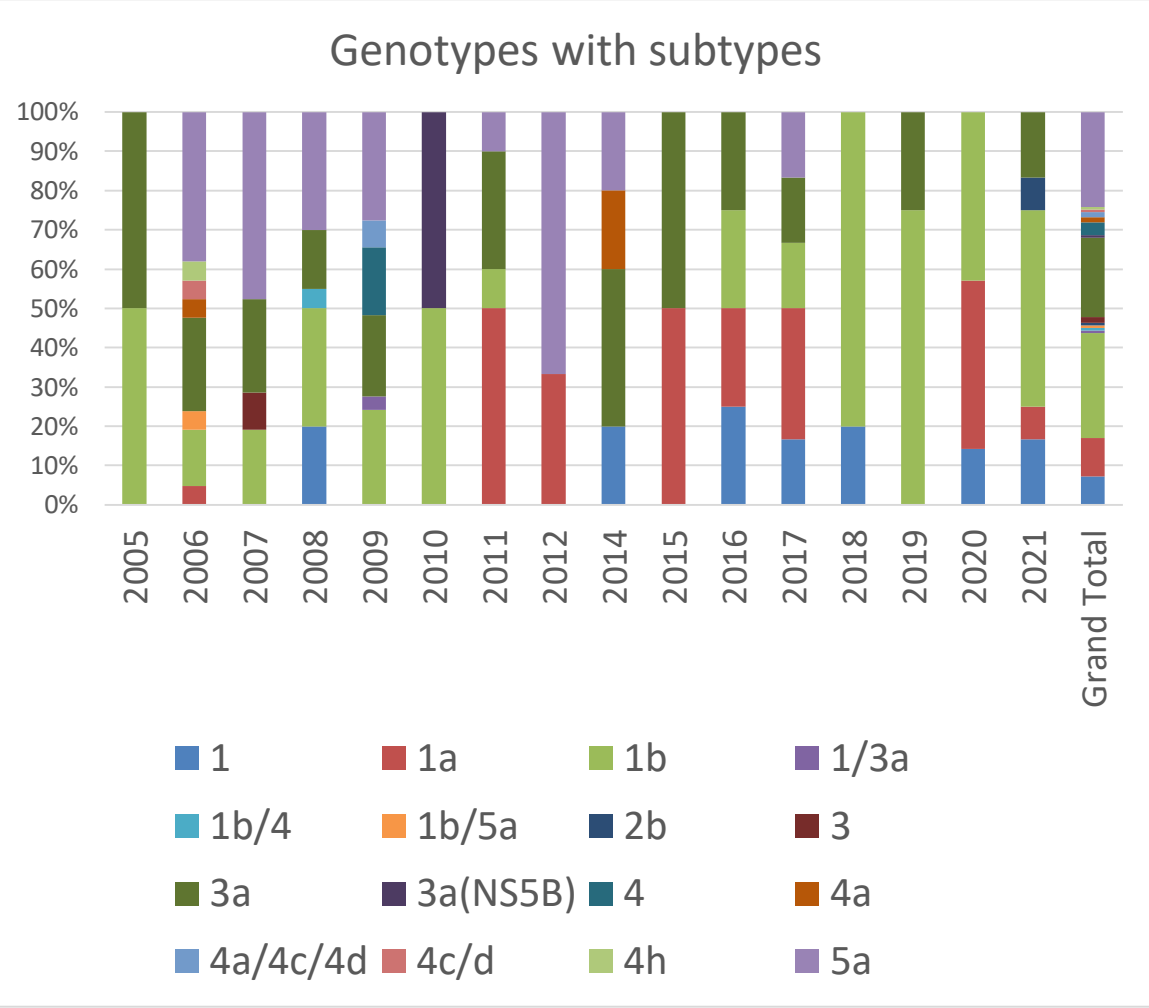
Eastern Cape (p=0.007)
Egoli (p=0.0006)
Freestate (p=0.005)
KZN (p=0.08)
Mpumalanga (p=0.0003)
Northern (p=0.03)
Vaal (p<0.0001)

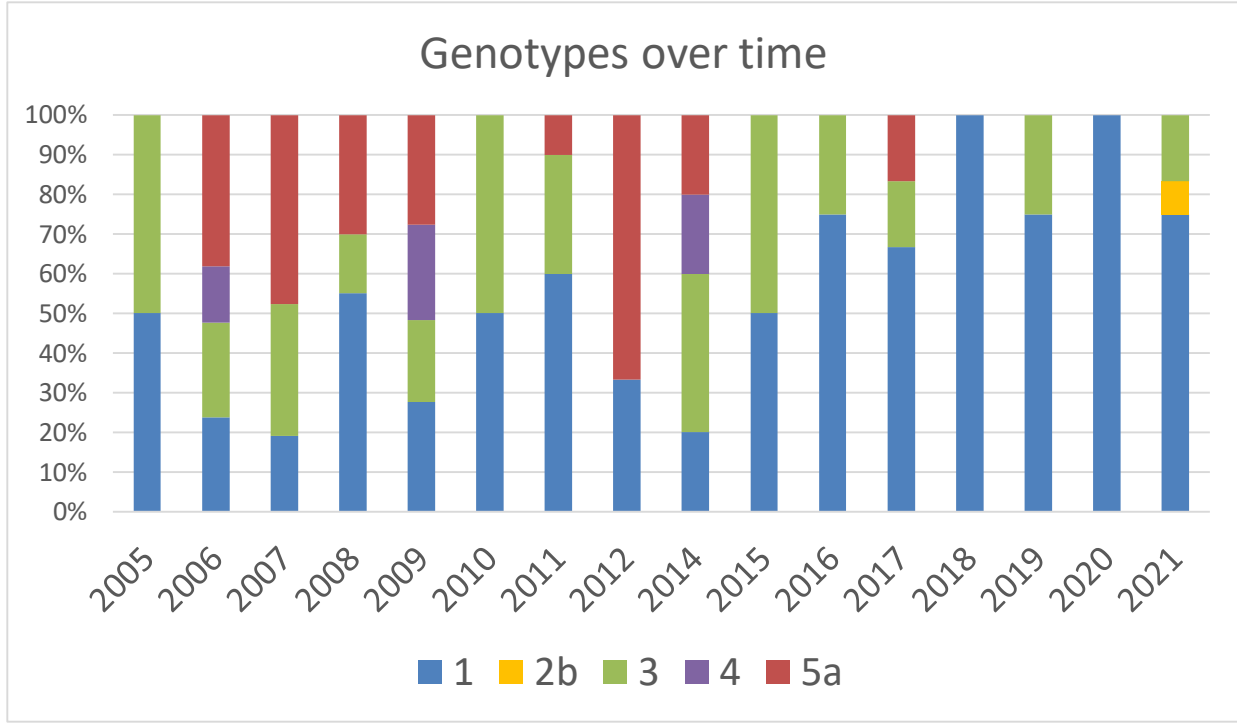
Characteristic	Proportion Blood donors n=167
HCV RNA positive – n (%)	153 (92%) all pos 1382 (84%)
Genotype (%)	
1	43.8%
1a	40%
1b	60%
2	
3 (all a)	22.2%
4	7.2%
4a	64%
5 (all a)	24.2%
1a/3	0.7%
1b/3	
1b/4	0.7%
1b/5a	0.7%
4a/4c/4d	1.3%
4c/4d	0.7%
4h	0.7%

PWID - Genotype 1a (73%) and 3a (15%) predominate

Genotype 5a unique to SA

Results - Genotypes





Concern in the increase in genotype 1

NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES

Division of the National Health Laboratory Service

SANBS

Hepatitis C laboratory data analysis on patients seeking medical attention in the public health sector, South Africa, 2017-2022

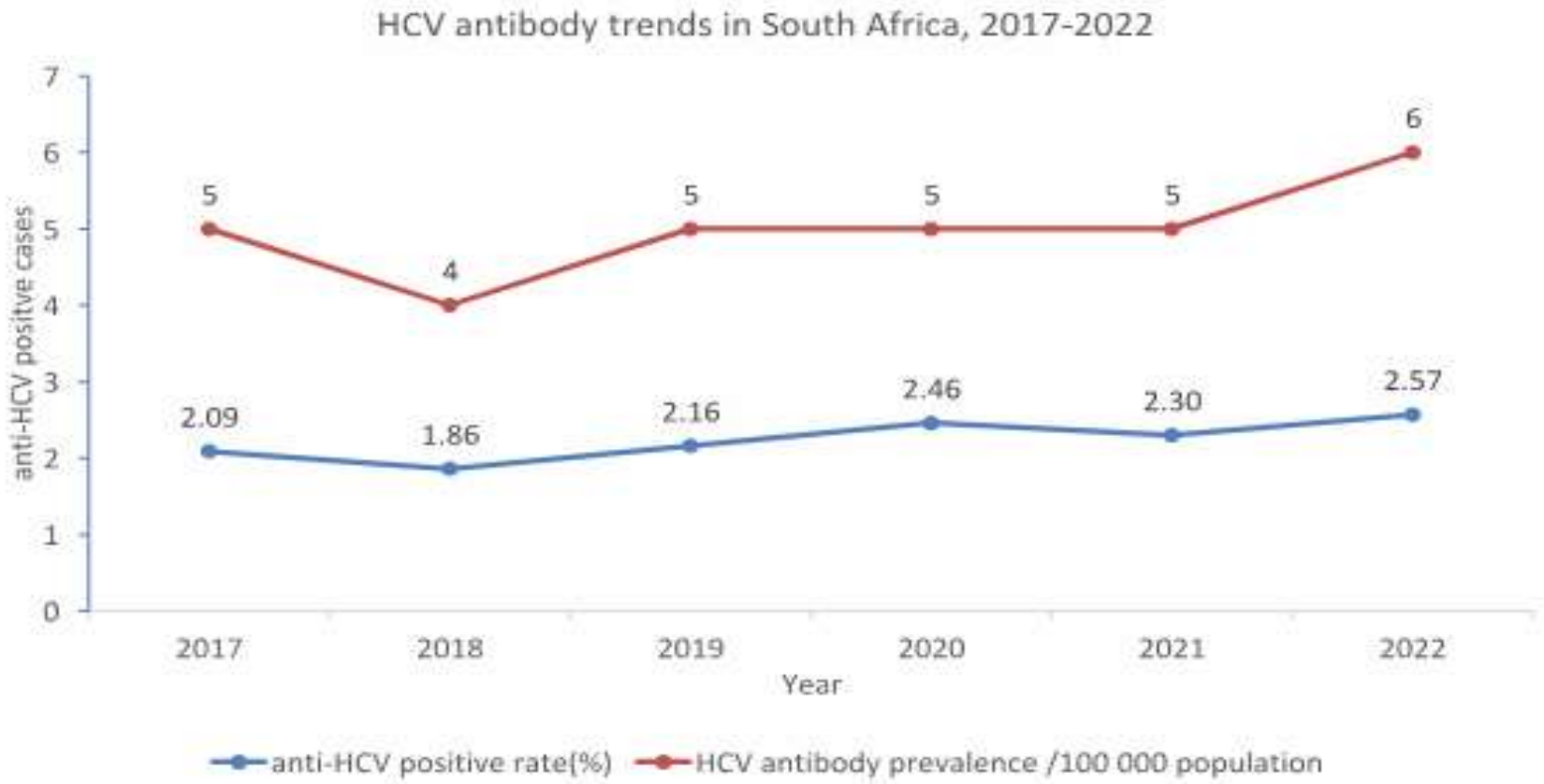
Authors: Morubula J Manamela[1], Victor Olago[1], Nishi Prabdial-Sing[1, 2]

1. National Institute for Communicable Diseases, a division of the National Health Laboratory Service division, South Africa.
2. Faculty of Health Sciences, School of Pathology, Division of Virology and Communicable Diseases Surveillance, University of Witwatersrand, Johannesburg, South Africa

19 February 2024

HCV Prevalence

HCV antibody testing positive rate and prevalence per year,2017-2022



Laboratory HCV antibody positivity rate by province

	Laboratory HCV antibody positive rate				
	2017	2018	2019	2020	2021
Province	N=3059	N=2219	N=3018	N=2904	N=3183
GAUTENG	3.58	4.43	4.27	4.72	5.42
KWAZULU-NATAL	0.91	1.06	1.02	1.10	1.19
WESTERN CAPE	1.28	1.07	1.04	1.14	1.22
EASTERN CAPE	2.51	1.37	1.43	1.47	1.55
MPUMALANGA	1.16	1.74	1.72	2.91	2.23
LIMPOPO	2.98	2.96	3.00	2.54	2.45
NORTH WEST	2.05	0.88	0.80	1.57	1.55
FREE STATE	1.82	0.95	0.92	1.19	0.73
NORTHERN CAPE	0.92	1.03	1.92	0.73	1.67
SOUTH AFRICA	**2.09**	**1.86**	**2.16**	**2.46**	**2.30**

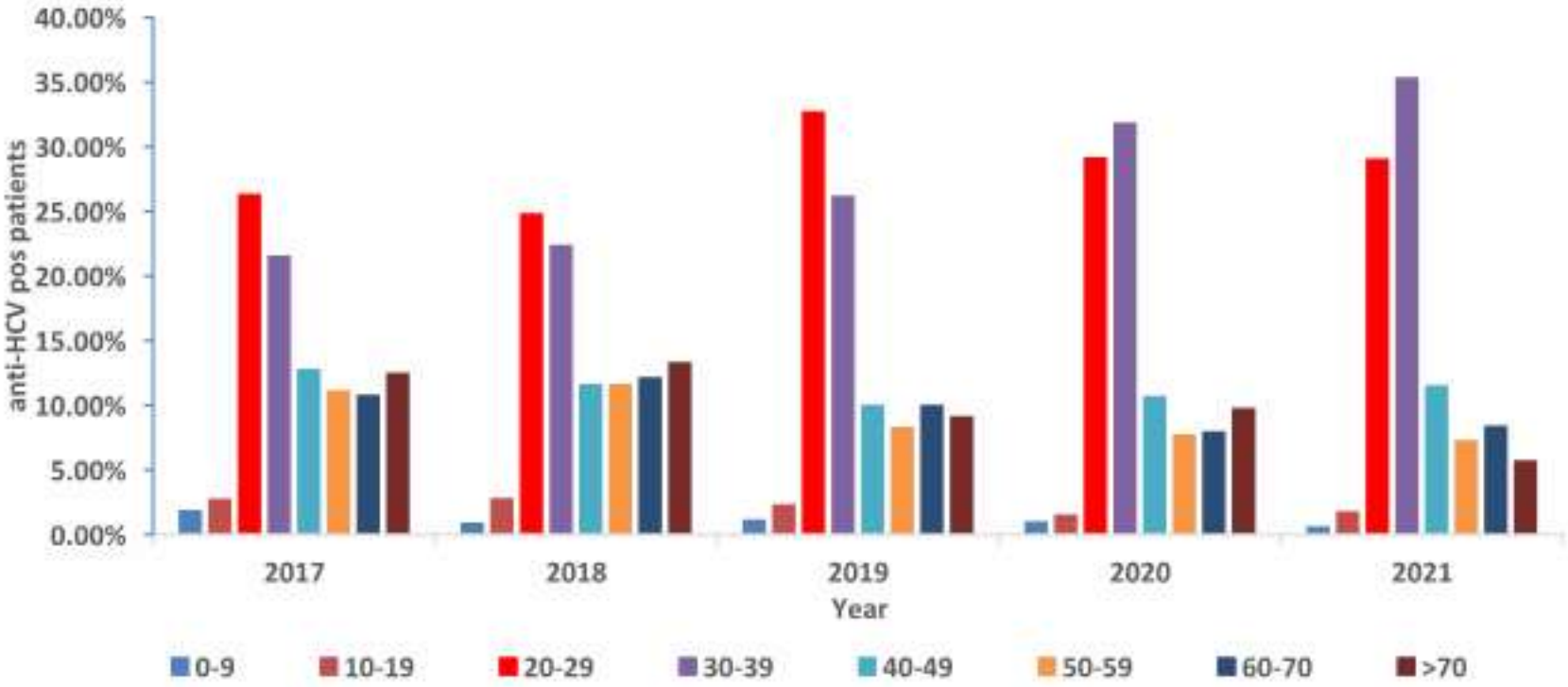
Probably due to referral patterns to tertiary healthcare

HCV antibody prevalence per 100 000 population

	HCV antibody prevalence/100 000 population				
Province	2017	2018	2019	2020	2021
GAUTENG	10	7	12	11	13
KWAZULU-NATAL	3	3	3	3	3
WESTERN CAPE	3	2	2	2	3
EASTERN CAPE	4	2	3	2	3
MPUMALANGA	3	3	4	6	5
LIMPOPO	4	3	4	3	3
NORTH WEST	3	2	1	2	2
FREE STATE	3	2	2	2	1
NORTHERN CAPE	3	3	3	2	3

Mpumalanga province shows an increase in HCV antibody prevalence/100 000 population

HCV antibody prevalence year and age group



- HCV antibody prevalence was high in patients between 20 and 39 years
- The pattern for HCV antibody prevalence was similar for the analysed year
- The age group analysis pattern is similar in all provinces

Hepatitis C genotype circulation in South Africa

HCV genotype	2017	2018	2019	2020	2021
1	1a	1a	1a	1a	1a
	1b	1b	1b	1b	1b
2	2a/c	2a/c	2a/c	2a/c	2a/c
	2b		2b		
3	3a	3a	3a	3a	3a
4	4a		4a		
	4b				
	4c/d		4c/d	4c/d	4c/d
5	5a	5a	5a	5a	5a
7			7A		

- Genotype 1 circulation was high between the 20 to 50 years persons
- Genotype 5 circulation was high in persons 50 years and older
- Genotype 7A not prevalent in South Africa-1 case detected in Western Cape province, Cape Town in 2019

Blood donors
54% of genotype 5a >50 years
81% of genotype 5a >40 years old

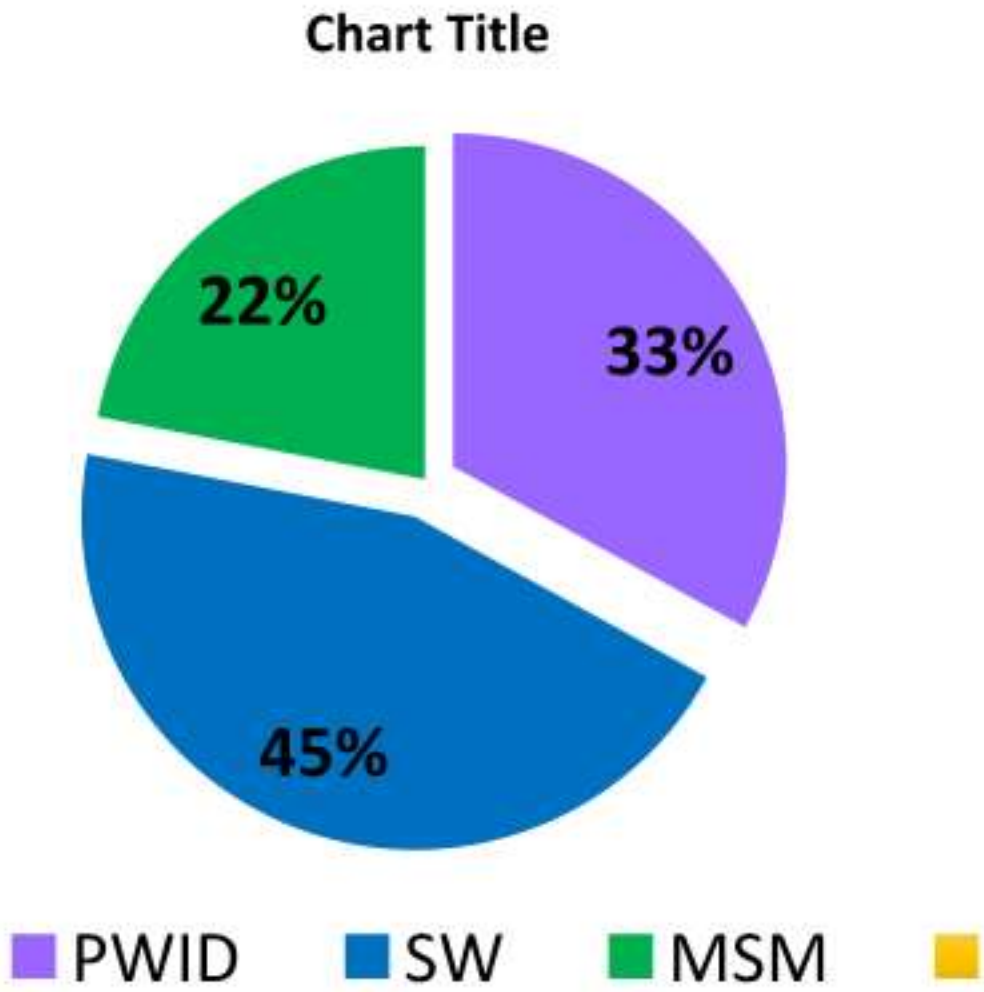
Key population study : South Africa 2017-2018



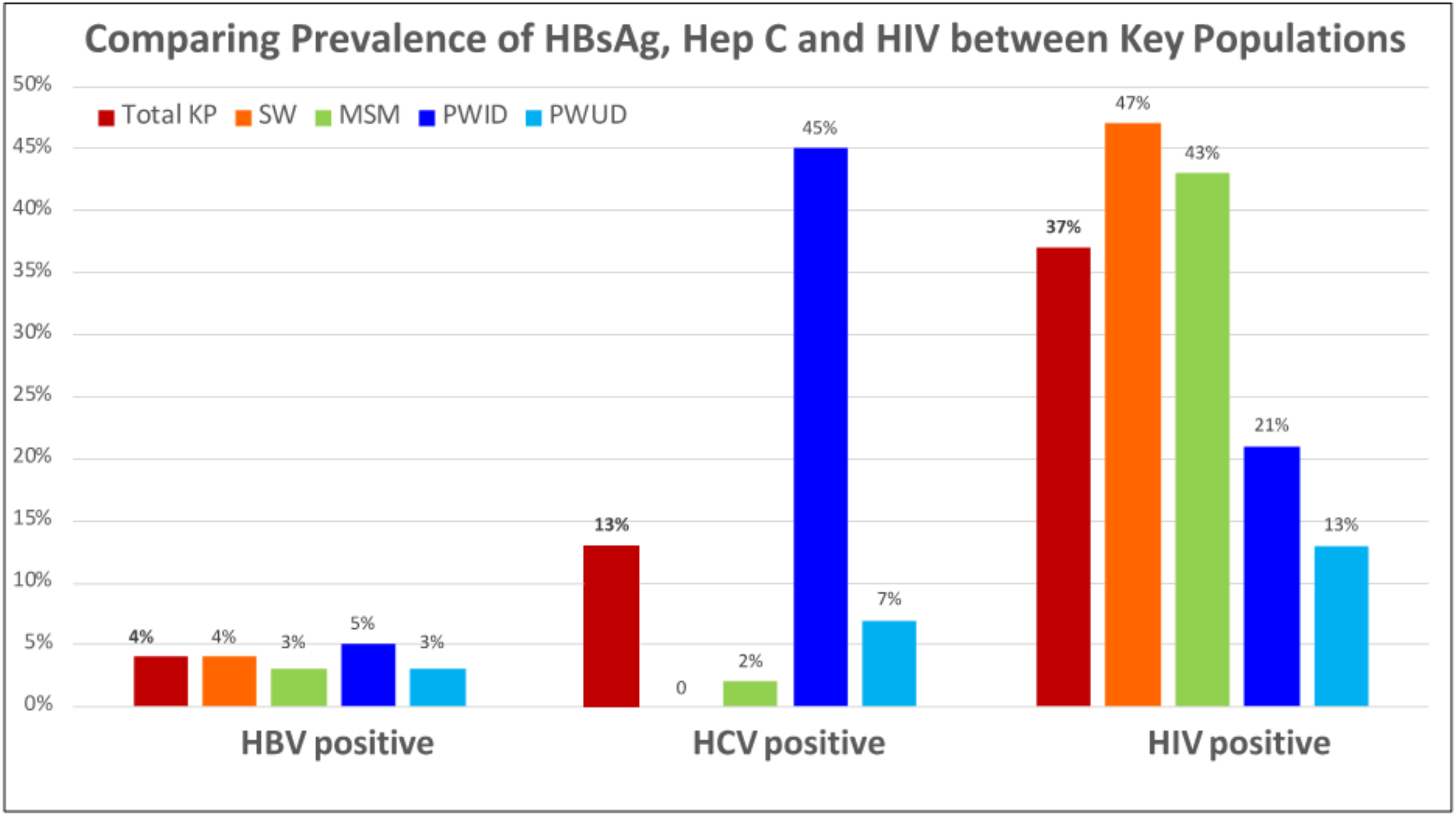
Population	Location	n
Men who have sex with men (MSM)	Cape Town	250
	Johannesburg	250
	Pretoria	250
	Total MSM	**750**
Sex Workers (SWs)	Cape Town	400
	Durban	400
	Pietermaritzburg	250
	Mthatha	250
	Port Elizabeth	250
	Total SW	**1550**
People who use drugs, incl. people who inject drugs (PWUD/ID)	Cape Town	80/320
	Durban	80/320
	Pretoria	80/320
	Total PWUD/ID	**240/960**
Total sample size (N)		**3500**

Scheibe et al. Harm Reduction Journal (2019) 16:28

Demographics, n = 3500



Age (y) median [IQR]	**30 [26 - 35]**
SW	32 [27 - 42]
MSM	30 [26 - 35]
PWID/UD	30 [26 – 36]
Race/Ethnic group - (%)	
Mixed Ancestry	20.7%
Black	60.9%
White	16.3%
Asian	2%


Comparing Prevalence of HBsAg, Hep C and HIV between Key Populations
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Total KP
SW
MSM
PWID
PWUD
4%
4%
3%
5%
3%
13%
0
2%
45%
7%
37%
47%
43%
21%
13%
HBV positive
HCV positive
HIV positive

Scheibe et al HCV prevalence in PWID

Table 5 Associations with HCV serostatus among PWID in three South African cities ($n = 943$)

	OR	95% CI	*P* value	aOR	95% CI	*P* value
Age (≥ 29 years)	1.21	0.93–1.56	0.151	1.00	0.74–1.36	0.995
Male sex	1.03	0.70–1.50	0.889	1.01	0.65–1.56	0.966
Black race	1.13	0.87–1.46	0.373	0.52	0.36–0.74	< 0.001
Pretoria	1.26	1.21–1.32	< 0.001	1.27	1.21–1.34	< 0.001
Living on the street	1.59	1.21–2.09	0.001	1.90	1.38–2.60	< 0.001
Injects ≥ 4 times per day	1.67	1.25–2.19	< 0.001	1.58	1.15–2.16	0.005
Used new needle at last injection	0.70	0.51–0.94	0.020	0.87	10.61–1.23	0.416
Shared needle at last injection	1.06	0.96–1.17	0.254	0.96	0.86–1.07	0.414
Sexually active in last month	0.40	0.31–0.52	< 0.001	0.61	0.42–0.88	0.008
Condom at last penile-vaginal sex	0.48	0.35–0.65	< 0.001	0.85	0.57–1.28	0.432
HIV infection	1.08	0.78–1.49	0.636	1.69	1.15–2.47	0.008

Genotypes in Key populations in South Africa

Hepatitis C virological characteristics

Characteristic	n = 532	p-value
HCV RNA positive – n (%)	448 (79.3%)	
HCV genotypes (%)		
1	76.3%	
1a	95.6%	
1b	1.7%	
3	19.5%	
4	4.3%	
1a/3	2.7%	
1b/3	0.3%	
Median HCV viral load, log IU/mL [IQR]	5.4 [4.8 – 5.9]	
SW	5.4 [4.2 – 5.6]	
MSM	5.6 [4.9 – 6.0]	p = 0.55
PWID/UD	5.4 [4.8 – 5.9]	

Characteristic	Proportion Blood donors n=167	Seeking medical attention (2017) n=168	PWID Population n=532
HCV RNA positive – n (%)	153 (92%) all pos 1382 (84%)		448 (79%)
Genotype (%)			
1	43.8%	47.0%	76.3%
1a	40%	72%	95.6%
1b	60%	28%	1.7%
2		14%	
3 (all a)	22.2%	9.5%	19.5%
4	7.2%	10.7%	4.3%
4a	64%		
5 (all a)	24.2%	28.6%	
1a/3	0.7%		2.7%
1b/3			0.3%
1b/4	0.7%		
1b/5a	0.7%		
4a/4c/4d	1.3%		
4c/4d	0.7%	2%	
4h	0.7%		

PWID - Genotype 1a (73%) and 3a (15%) predominate

Genotype 5a unique to SA and found in people with liver disease

Donor Questionnaire

Q4. In the past 3 months:			
Q4.1. Have you had a blood transfusion or received blood products?	YES	NO	
Q4.2. Have you had acupuncture, kavady prayers or dry needling?	YES	NO	
Q4.3. Have you taken part in a drug/vaccine trial or any other clinical research?	YES	NO	
Q4.4. Have you had a severe asthma attack, a surgical procedure or been admitted to hospital?	YES	NO	
Q4.5. Have you injected yourself or been injected with body-building drugs, recreational or street drugs?	YES	NO	
Q4.6. Have you had a tattoo, body or ear piercing, or permanent make up applied?	YES	NO	
Q4.7. Have you had Raatib, ritual scarring, ritual piercing, ritual circumcision, blood sharing, or been stabbed?	YES	NO	
Q4.8. Have you had a needle-stick or skin-penetrating injury, eye-splash or skin contact with another person's blood?	YES	NO	

Conclusion

- HCV prevalence is increasing in blood donors in South Africa
- Highly significant increase in <40 year old and white blood donors which correlates with the population seeking medical assistance and PWID
- There has been a genotype change in blood donors with no genotype 5 seen in the last 5 years
- Blood donors can be a source of information for public health initiatives especially where there are long asymptomatic stages

Acknowledgements

- Dr Nishi Pradial-Sing Centre for Vaccine and Immunology,NICD
- Mr Victor Olago Cancer Registry, NICD
- NHLS Central Data Warehouse for providing the hepatitis C data
- Morubula J Manamela, NICD
- Mark Sonderup, UCT

Thank you