

**HBV AND SYPHILIS CO-INFECTIONS IN  
SOUTH AFRICAN NATIONAL BLOOD SERVICE DONORS  
JANUARY 2013 TO DECEMBER 2015**

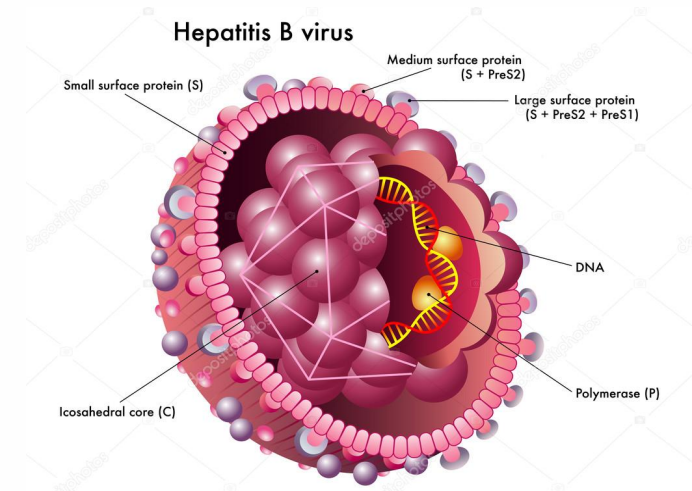


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South African National Blood Service



# Background

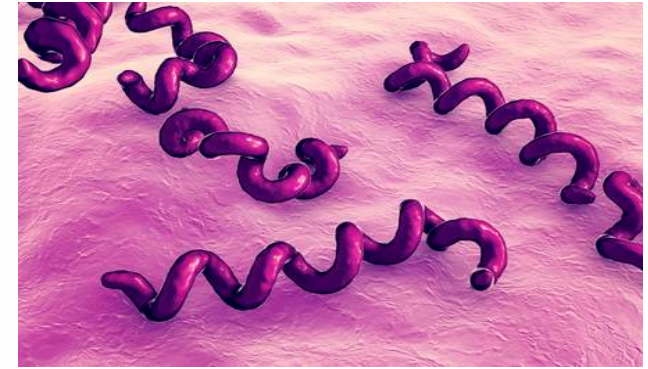
- The South African National Blood Service tests all blood donations for Hepatitis B virus (HBV) and Syphilis
- HBV is endemic in South Africa (SA) with an estimated sero-prevalence of 8 – 10% and an estimated 2.5 million people chronically infected
- HBV is a virus that causes a life-threatening infection of the liver and can be sexually transmitted





# Background..

- Syphilis is a highly contagious sexually transmitted bacterial infection caused by *Treponema pallidum* (TP)
- It is spread mainly through sexual contact with someone with a syphilitic sore
- Testing for Hepatitis B surface antigen (HBsAg) started in the mid 1980's and in the 1990's a syphilis test that detects past as well as current infections i.e. TP Haemagglutination (TPHA) assay was introduced
- The long term positivity of TPHA has allowed it to be used as a surrogate marker for other sexually transmitted infections





# Aims

- To determine the rate of syphilis and HBV infections
- To determine whether syphilis testing is an effective surrogate marker for HBV in SANBS blood donors





# Study design: Screening for HBV

## Molecular testing:

- The Ultrio Plus Assay on the Grifols Tigris was used to screen for HBV DNA
- Reactive donations were tested twice more and Discriminatory testing was used for the discrimination of HBV



## Serological screening:

- Abbott Prism was used to screen all blood donations for HBsAg using chemiluminescent microparticle technology
- Initial reactive units were repeated in duplicate and confirmatory testing was performed on the Roche Cobas e411 analyser



# Study design: Syphilis screening

## Syphilis testing:

- Screening for TP antibodies was performed using BioRad TPHA reagent on the Beckman Coulter PK7300 instrument

## TPHA confirmatory testing:

- Performed on all TPHA repeat reactive samples on the Cobas e411
- Carbon Antigen Venereal Disease Research Laboratory (VDRL) was used to distinguish between past and current infections





# Study design

- Donations from January 2013 to December 2015 were analysed to determine the rate of Syphilis, HBV and co-infections
- Bivariate analysis of positive rates by age, gender and ethnic group was performed
- Data was compared using the Chi square test, with a significant result indicated by  $p \leq 0.05$ .





# Results

2,491,372 donations tested - January 2013 to December 2015

Syphilis	HBV				Total
	Negative	%	Positive	%	
Negative	2,483,845	99.7	2,087	0.08	2,485,932
Positive	5,377	0.22	<b>63*</b>	0.003	5,440
Total	2,489,222	99.91	2,150	0.09	2,491,372

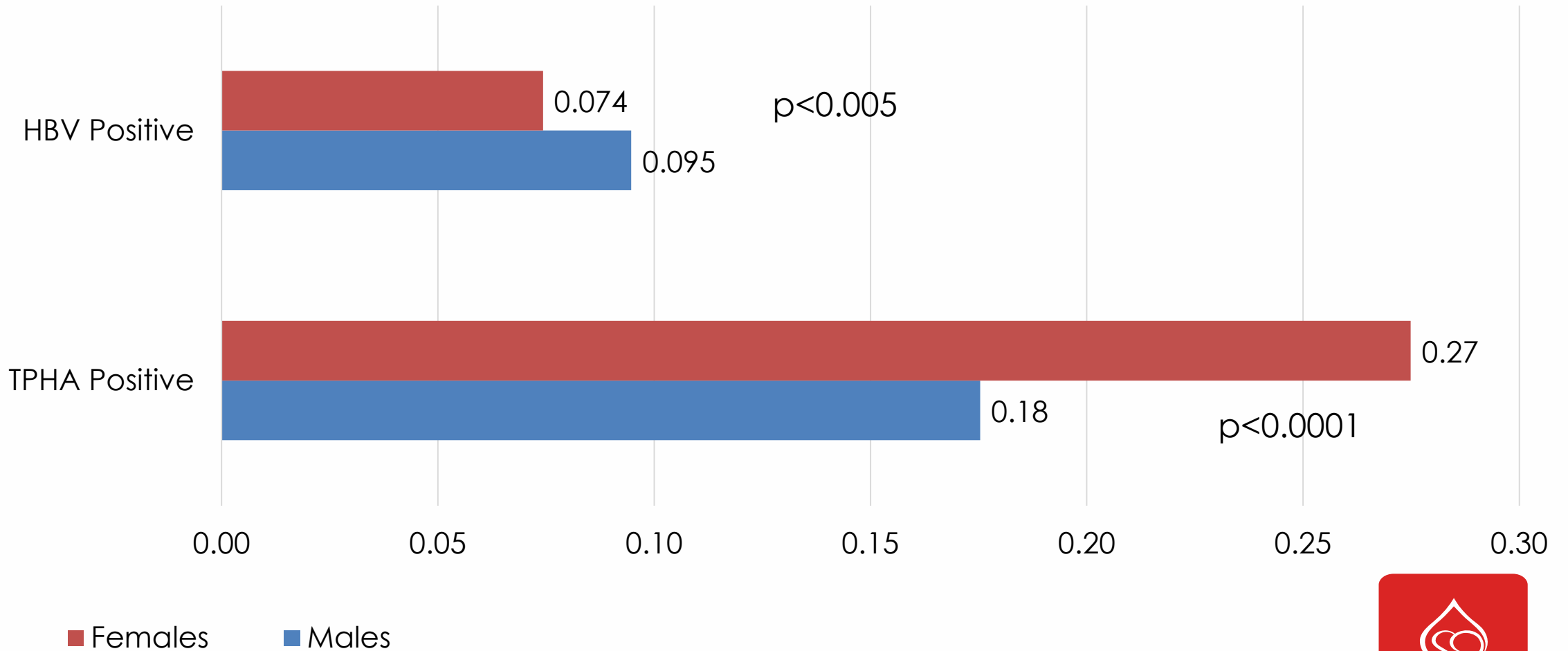
\* OR 13.9 (95% CI 10.8 – 17.9)

**p-value <0.0001**



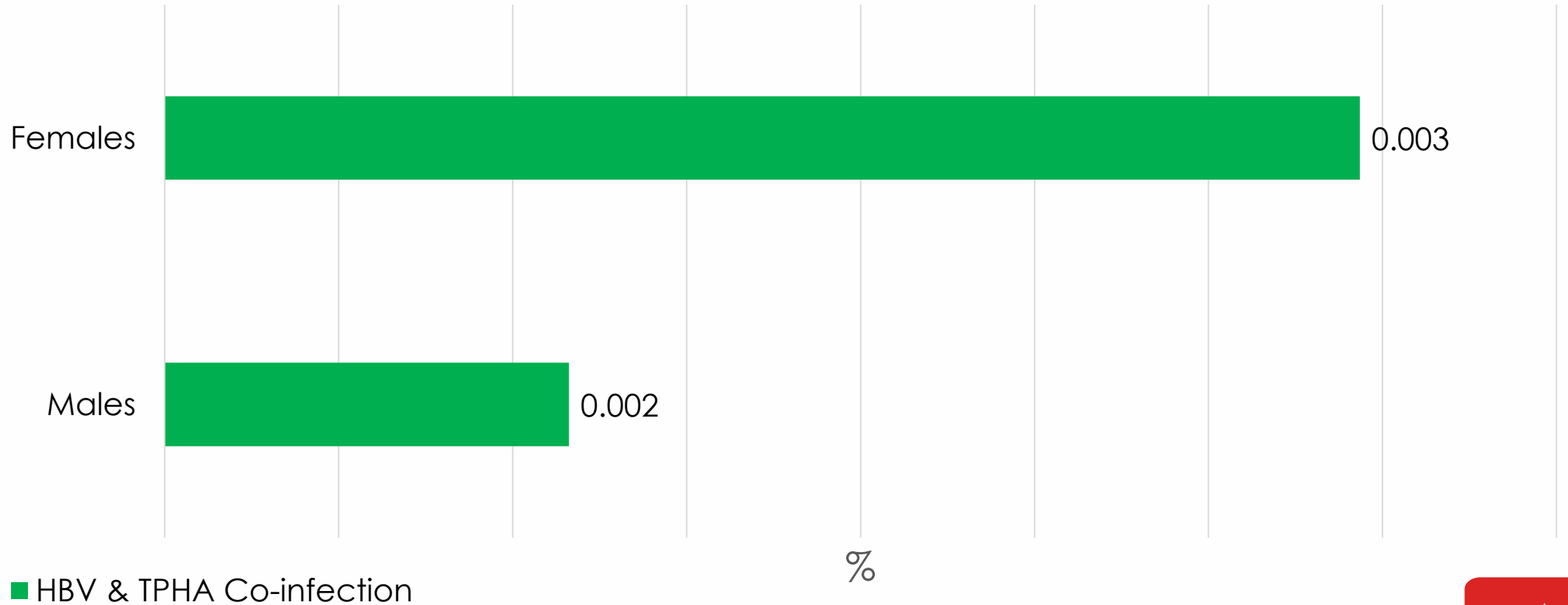


# TPHA and HBV Positive Donations by Gender

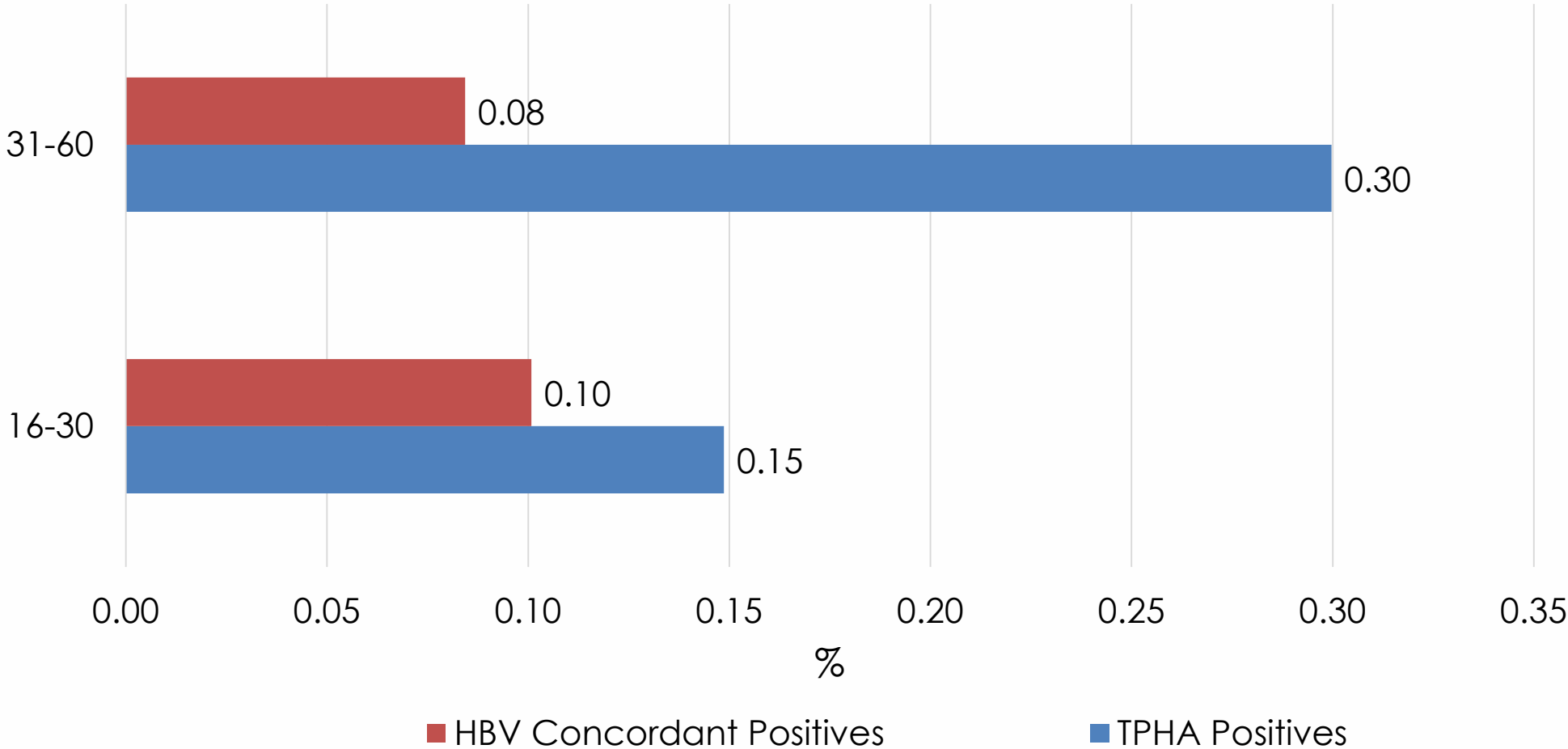




# Rate of Syphilis and HBV Co-infections by Gender

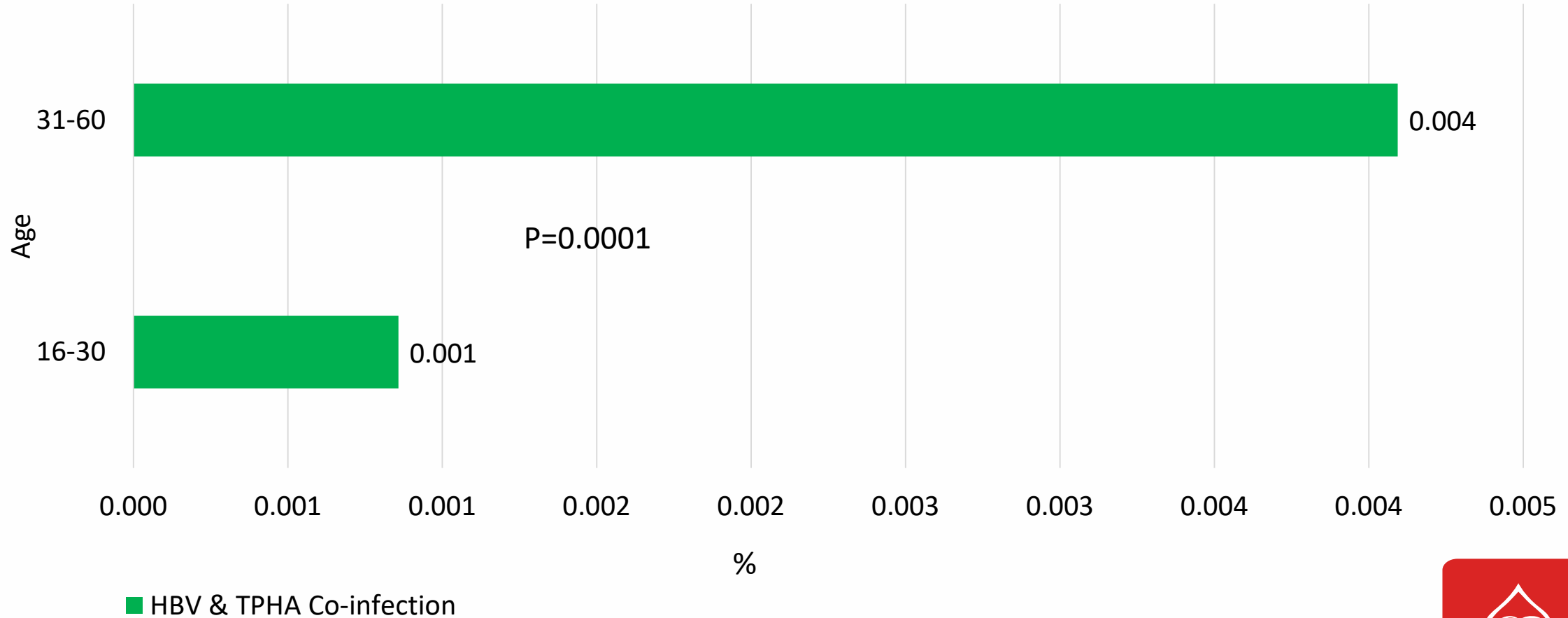


# TPHA and HBV Positive Donations by Age Group

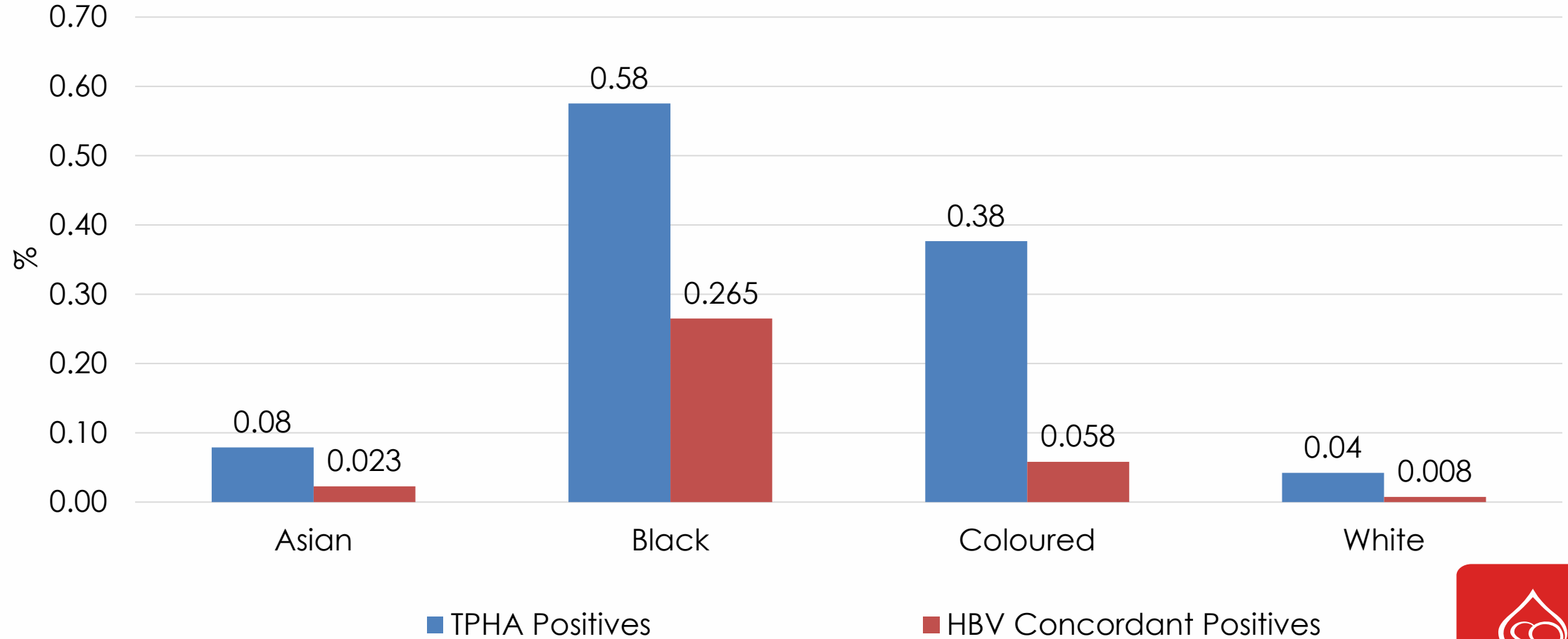




# Rate of Syphilis and HBV Co-infections by Age Group

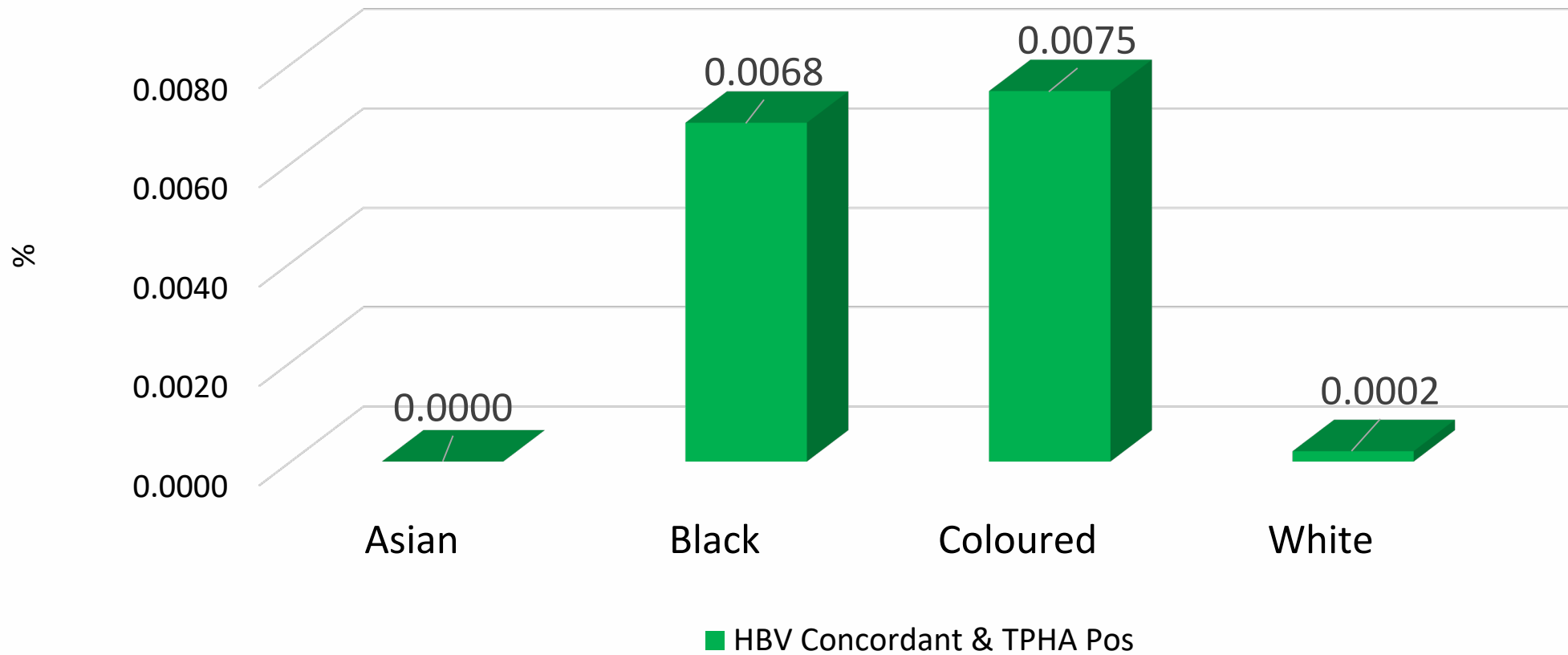


# TPHA and HBV Positive Donations by Population Group





# Rate of Syphilis and HBV Co-infections by Population Group

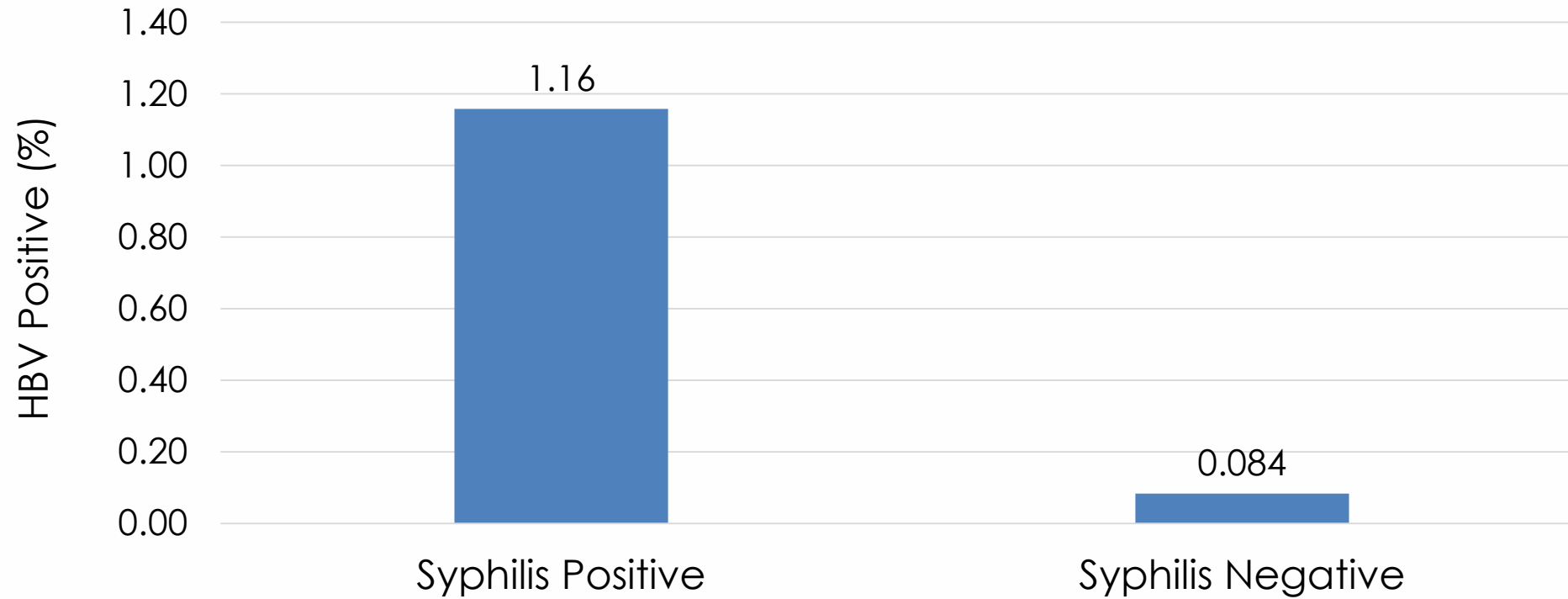




# Results:

## Syphilis Positive Donors, HBV Co-infected

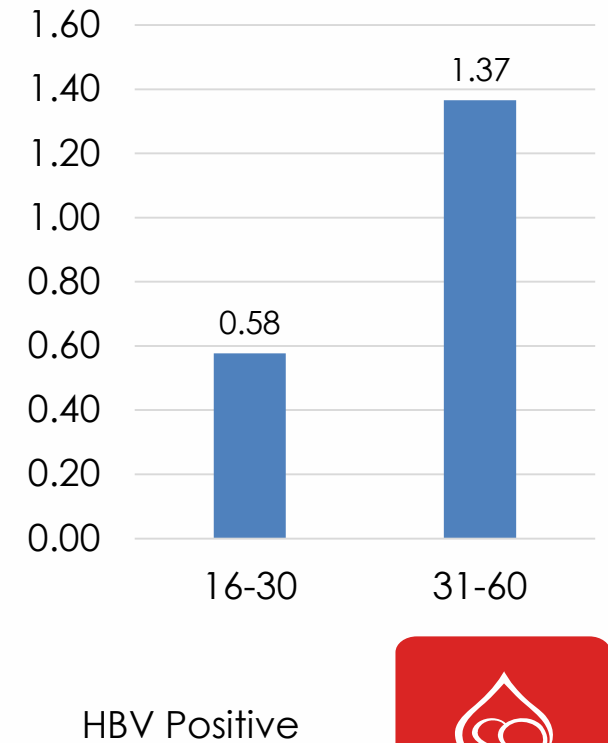
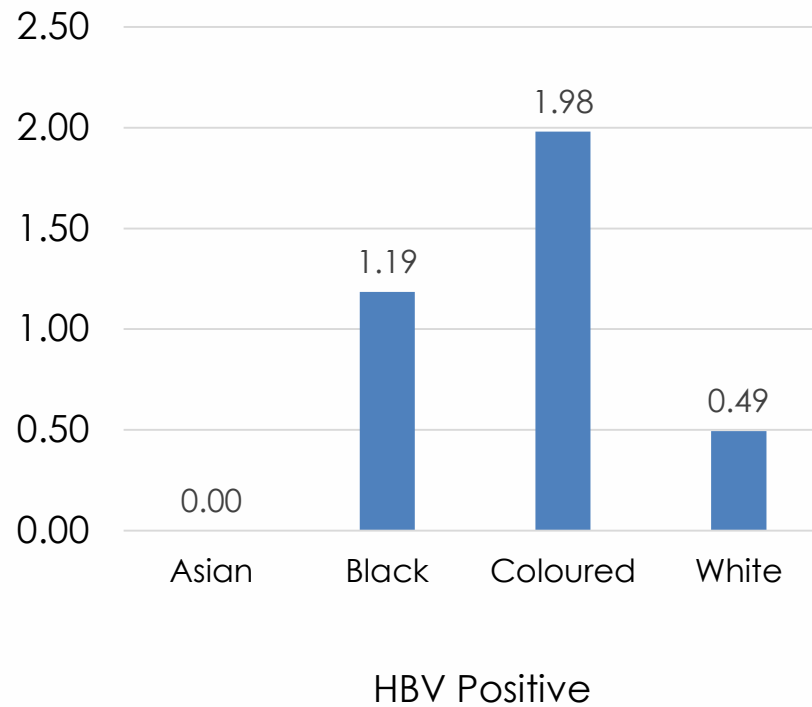
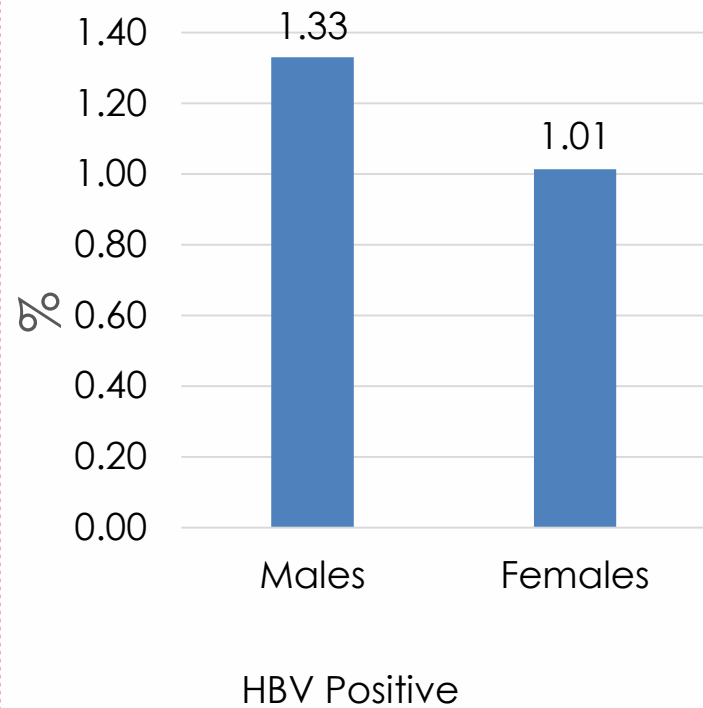
- Of 5,440 Syphilis positive donors, 63 (1.16%) were also HBV positive
- Of 2,485,932 Syphilis negative donors, 2,087 (0.084%) were HBV positive





# Results:

## Syphilis Positive Donors(5,440), HBV co-infected







# Discussion / Conclusion

- Syphilis and HBV co-infections were highest in Black, Coloured and middle-aged donors
- Of the syphilis positive donors, male donors, coloured donors and donors over age 30 were more likely to be HBV co-infected



# Discussion / Conclusion

- There were many syphilis negative donors that were HBV positive; however blood donors who are Syphilis positive were 14 fold more likely to be HBV positive than Syphilis negative donors
- As has been shown by other investigators\*, syphilis is a poor surrogate marker for HBV infection

\*Zou *et al.* 2009



*Thank you*