



14th
**International Donor Registry Conference
& WMDA Meetings**

25 – 29 June, 2024 – Cape Town, South Africa

All Patients and Donors Matter

www.capetownidrc.co.za



HLA-haplotype based matching probabilities for four population groups in South Africa

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DKMS 

WE DELETE BLOOD CANCER



DKMS Africa: Established April 2020



www.visualcapitalist.com/map-true-size-of-africa/



More than 90,000 potential donors

Engagement of local community and willingness to register is high



Collections

46 collections so far (11 in 2024)



DKMS Registry

Donors are accessible via DKMS Registry, WMDA SMC, EMDIS

HLA-haplotype based matching probabilities for four population groups in South Africa

DKMS Africa: Become a potential donor!

The screenshot shows the DKMS Africa website homepage. The browser address bar displays 'dkms-africa.org'. The top navigation menu includes links for 'FAQ', 'Contact', 'Press', 'Update Details', 'Careers', and 'Companies, Schools & Others'. A search bar is located in the top right corner, with a yellow arrow pointing to it. Below the navigation menu are two buttons: 'BECOME A DONOR' (red) and 'DONATE MONEY' (green). The main banner features a smiling woman with braids holding a DKMS informational card. The card has the DKMS logo and the text 'TOGETHER WE CAN SAVE LIVES' and 'IMPORTANT: PLEASE BRING YOUR OWN ID'. Overlaid on the banner is the text 'You can save a life!' and a 'REGISTER NOW' button. Below the banner is a red section with the text 'We are making a difference.'

Population groups

- Afrikaans
- English
- isiNdebele
- isiXhosa
- isiZulu
- Sepedi
- Sesotho
- Setswana
- Siswati
- Tshivenda
- Xitsonga
- Other



← Back

Step 9

Tell us about your ethnicity:

It's really important for us to understand your ethnic background. Finding matching donors is never easy, but it's even harder for people with a mixed ethnicity as the pool of donors is much smaller.

Your ethnicity *

Your native language *

Your mother's details

Country of origin *

Ethnicity *

Your father's details

Country of origin *

Ethnicity *

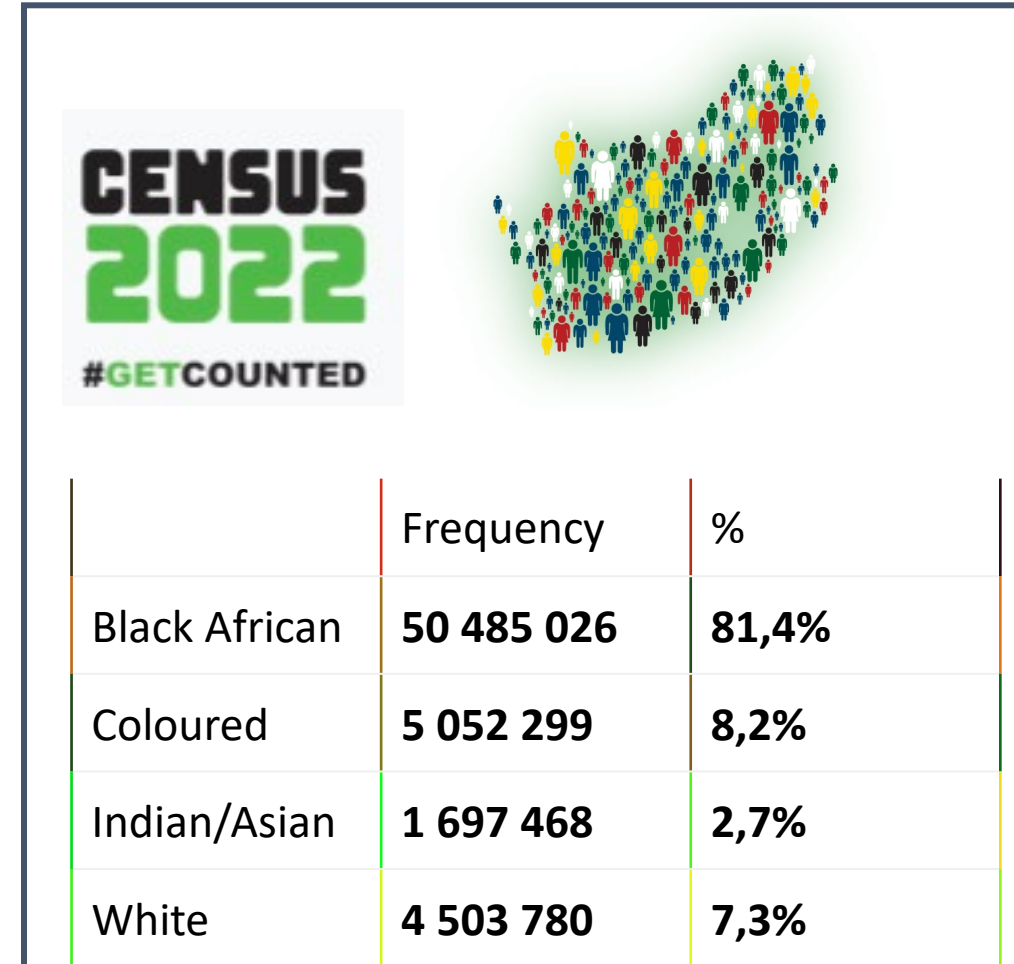
- Black
- Coloured
- Indian / Asian
- White
- Other

Population groups

- Self-assigned ethnicity
→ identical to mother's and father's assignment
- Both parents from South Africa
- Cohort size: 56,710

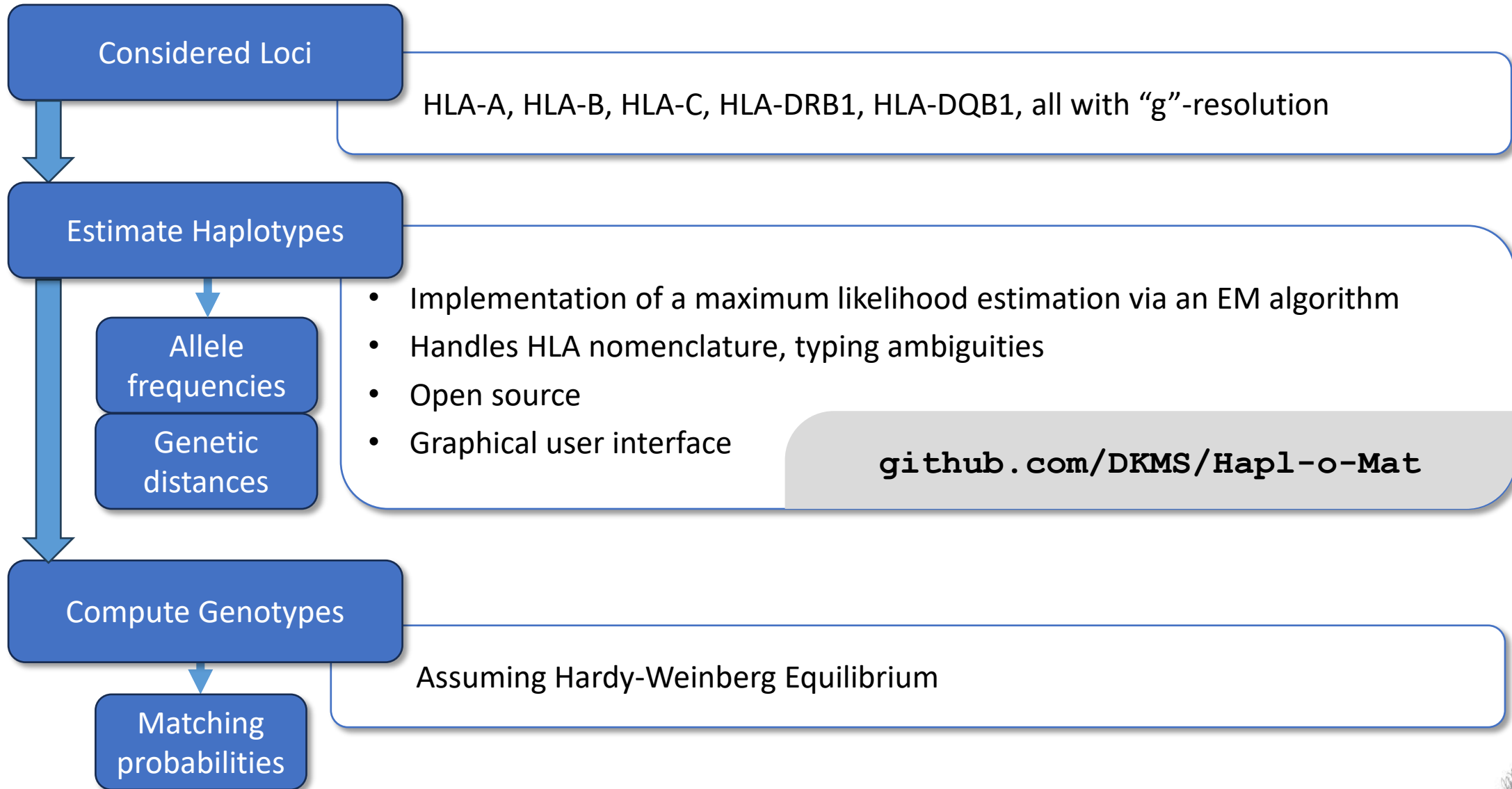
Black	19,999	35.3%
Coloured	4,699	8.3%
Indian / Asian	4,982	8.8%
White	27,030	47.7%

← 9 % in 2021

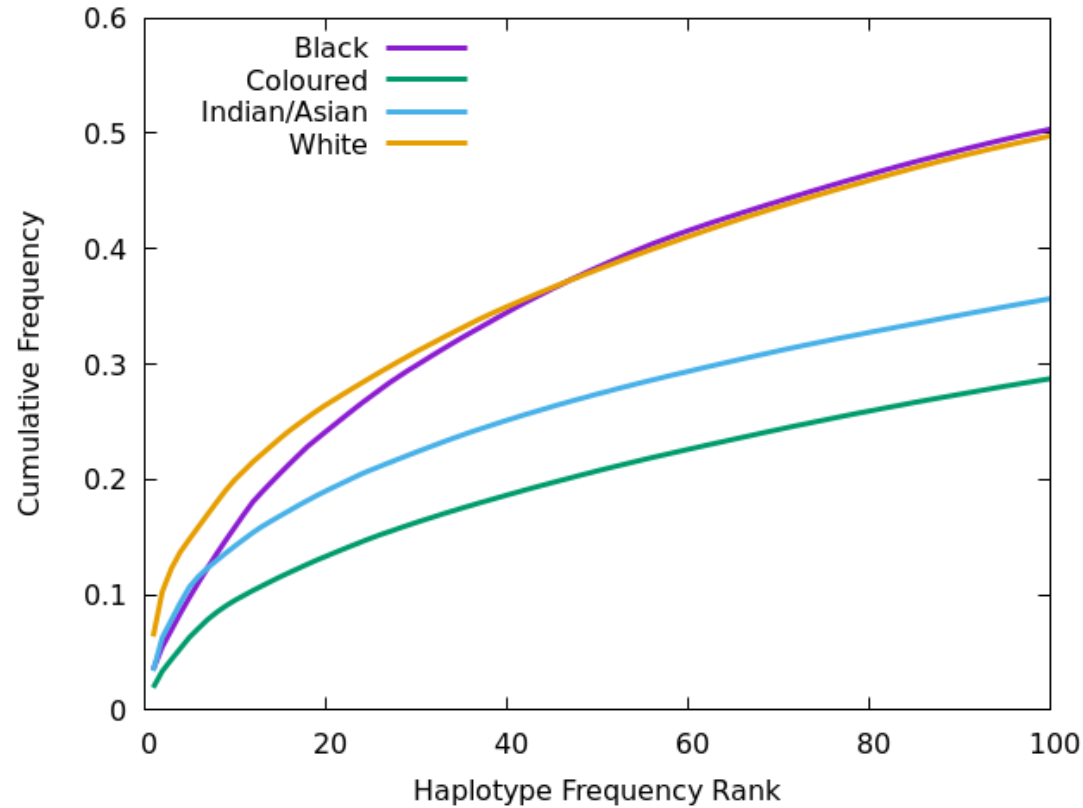


census.statssa.gov.za

Methods



Results: Cumulated Haplotype Frequencies



Black	A*30:01g~B*42:01g~C*17:01g~DRB1*03:02g ~DQB1*04:02g	3.4%
Coloured	A*01:01g~B*08:01g~C*07:01g~DRB1*03:01g ~DQB1*02:01g	2.0%
Indian / Asian	A*01:01g~B*57:01g~C*06:02g~DRB1*07:01g ~DQB1*03:03g	3.4%
White	A*01:01g~B*08:01g~C*07:01g~DRB1*03:01g~DQB1*02:01g	6.2%

Results: Genetic Distances

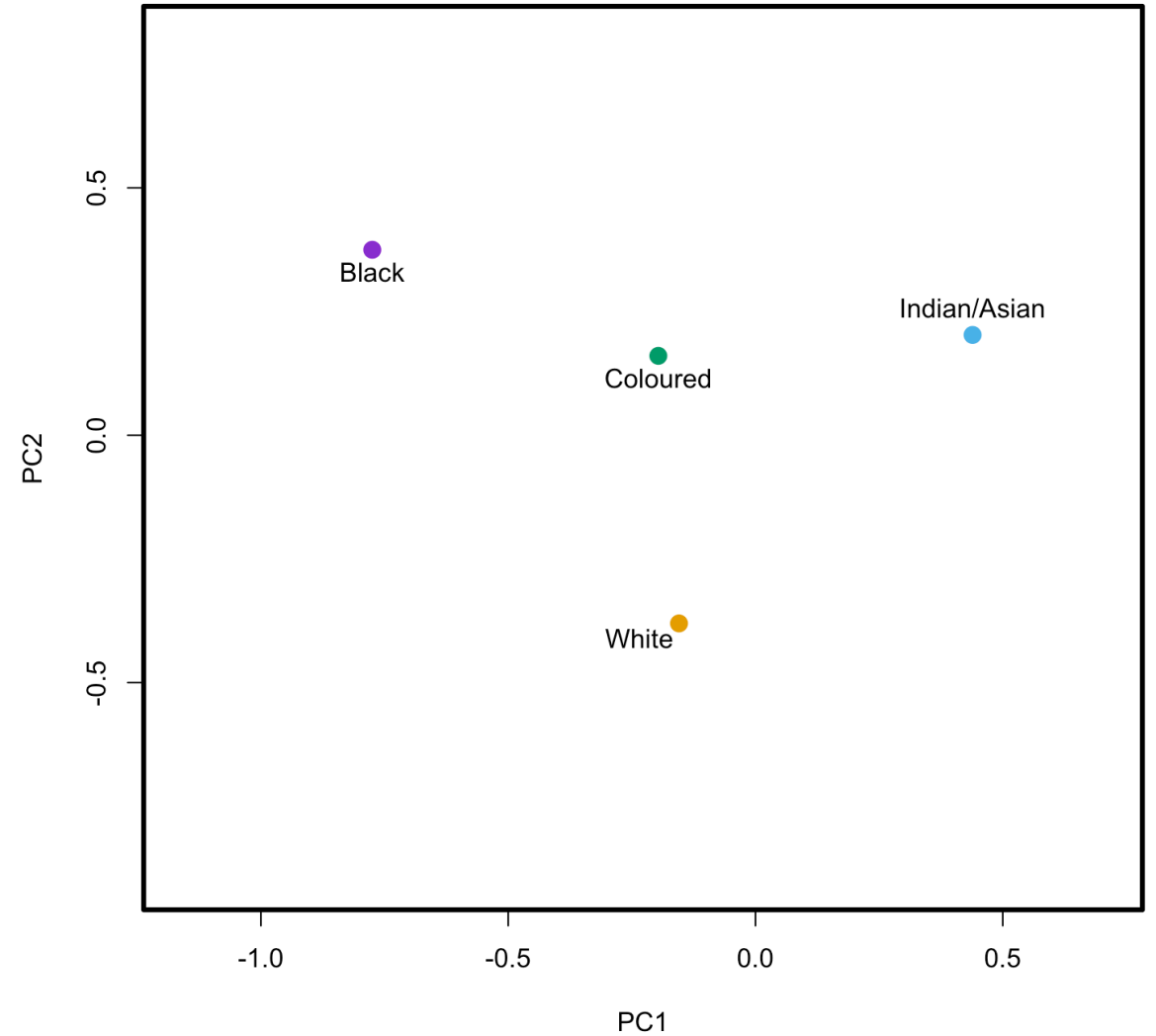
- Per locus: Cavalli-Sforza

$$d_j = \frac{2}{\pi} \sqrt{2 * (1 - \sum_{i=1}^n \sqrt{f_i * g_i})}$$

- Across loci: Euclidian

$$D = \sqrt{\sum_{j=1}^5 d_j^2}$$

GoF = 0.94

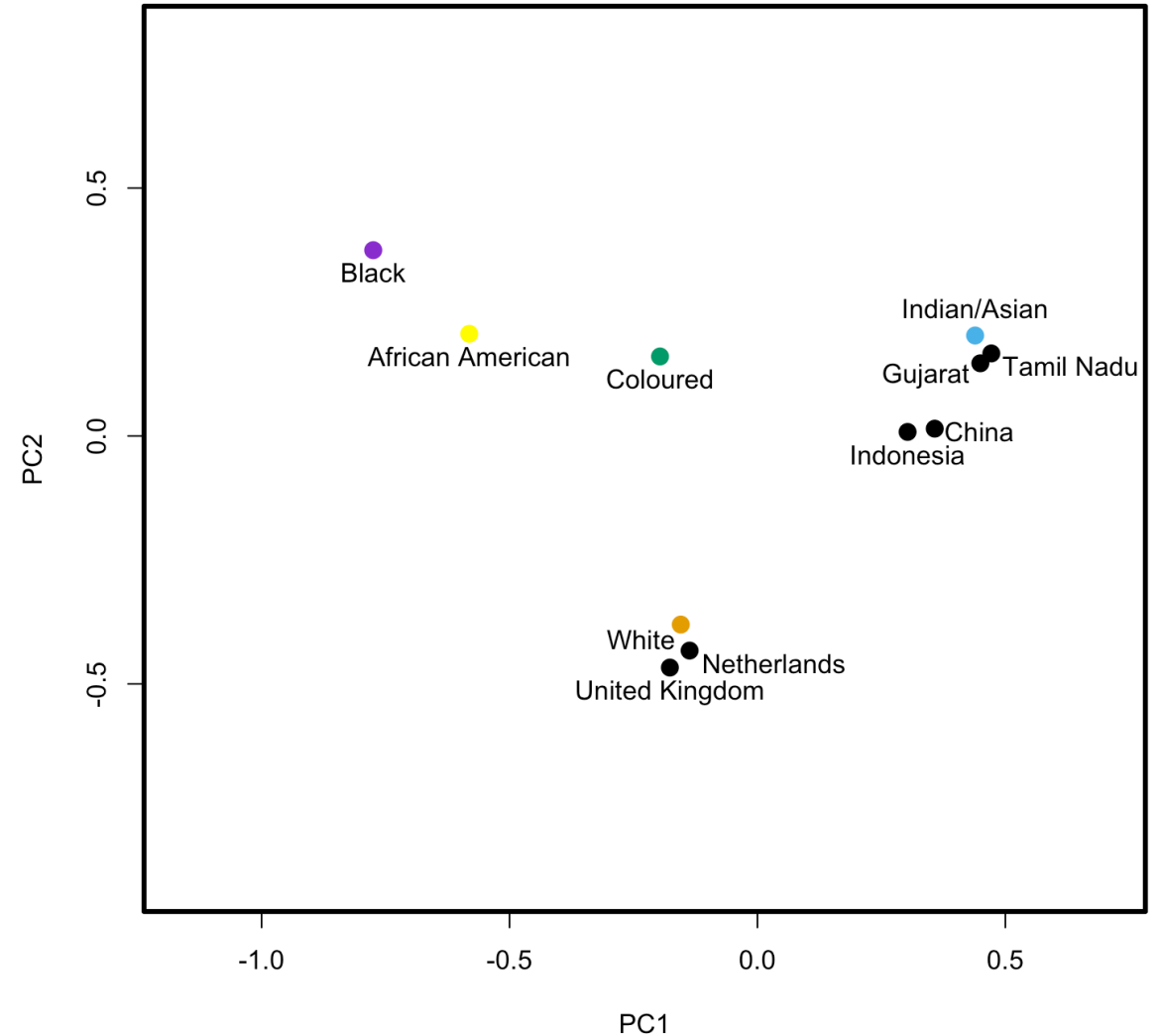


Results: Genetic Distances

Additional samples with ethnic backgrounds from:

- African-American
- China
- India:
 - Gujarat
 - Tamil Nadu
- Indonesia
- Netherlands
- United Kingdom

GoF = 0.76



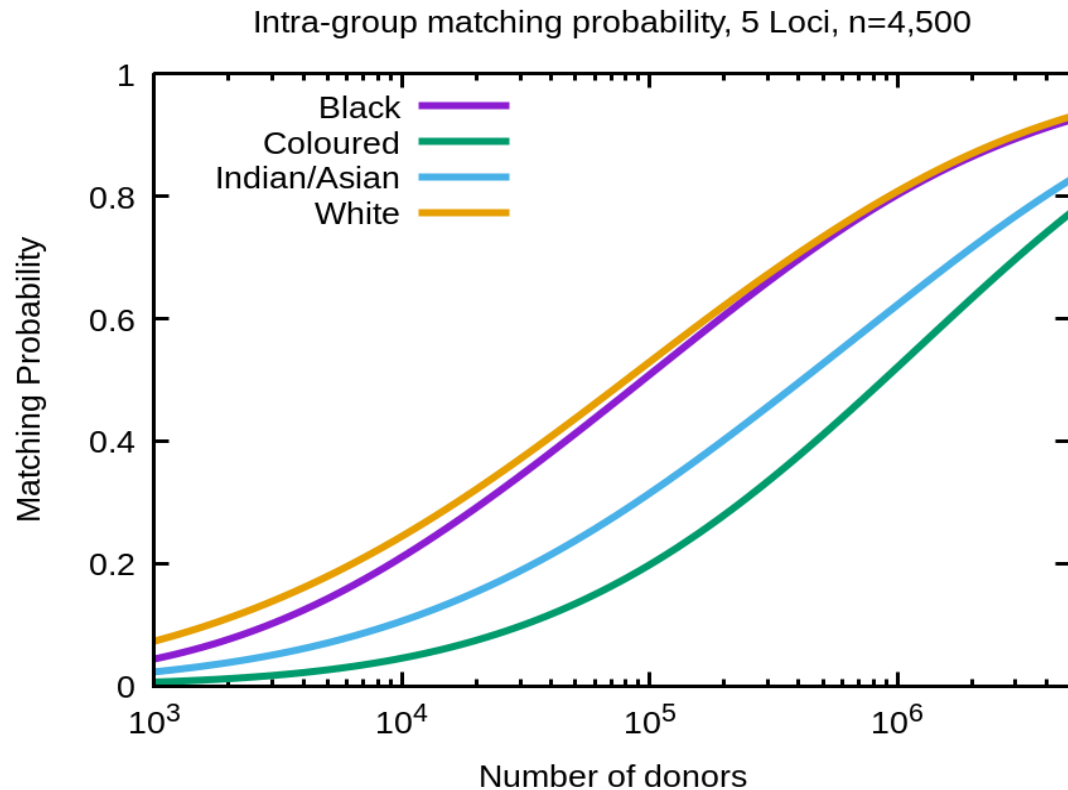
Results: Matching Probabilities

Methods

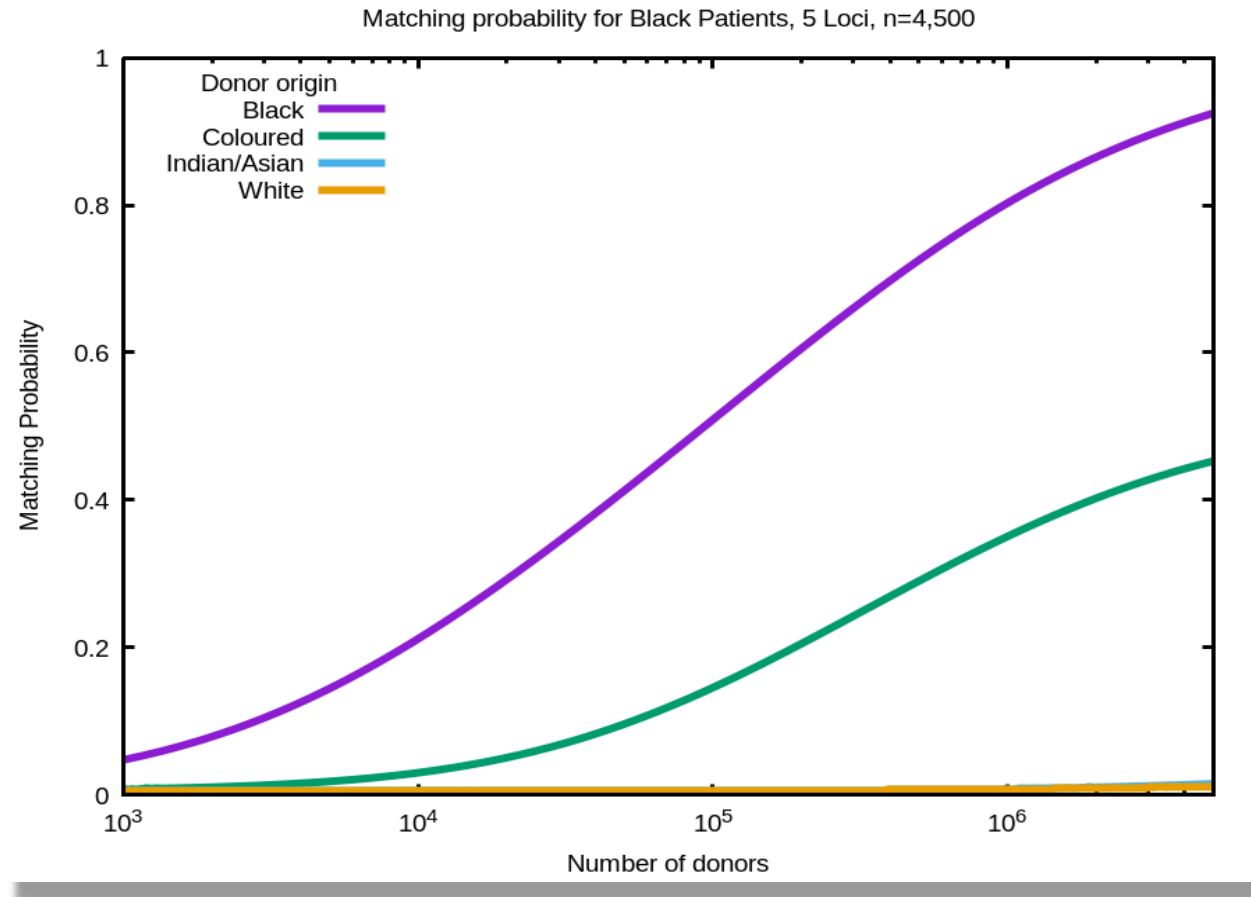
- Sample size “equalization”: Random subset of 4,500 individuals

Black	19,999	4,500
Coloured	4,699	4,500
Indian / Asian	4,982	4,500
White	27,030	4,500

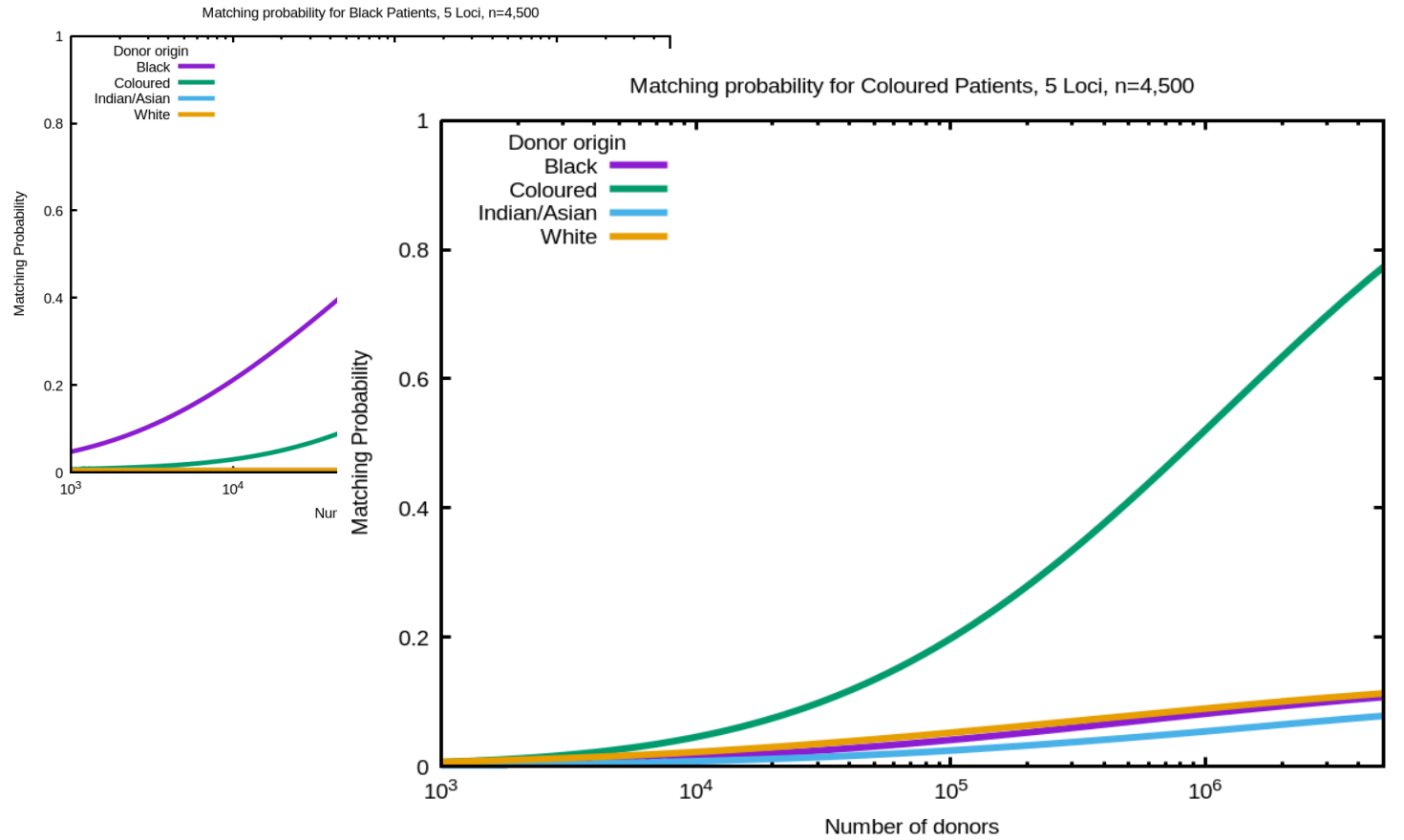
- Frequency cut-off: $\sum_i f_i \leq 99.5\%$



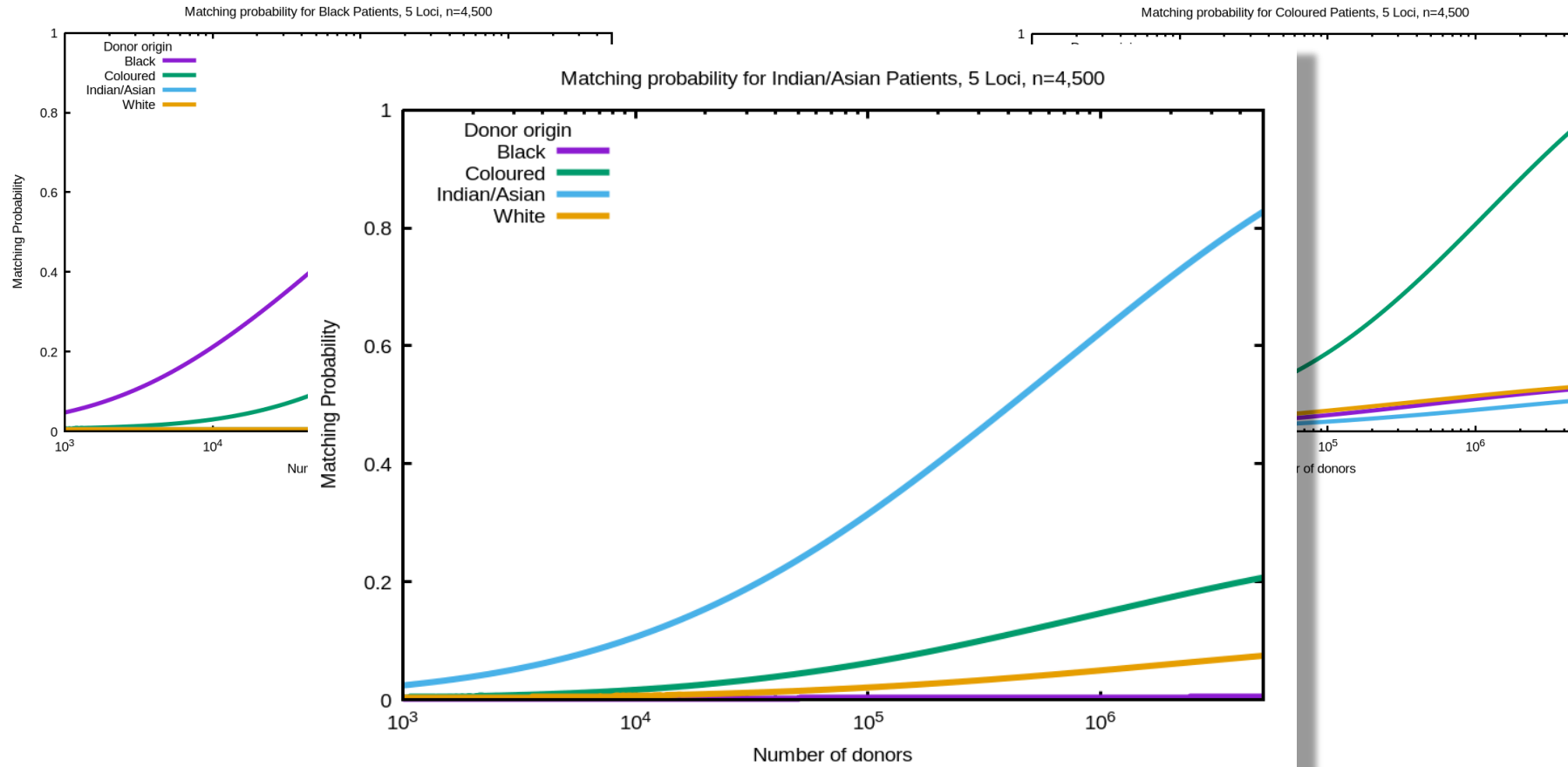
Results: Matching Probabilities



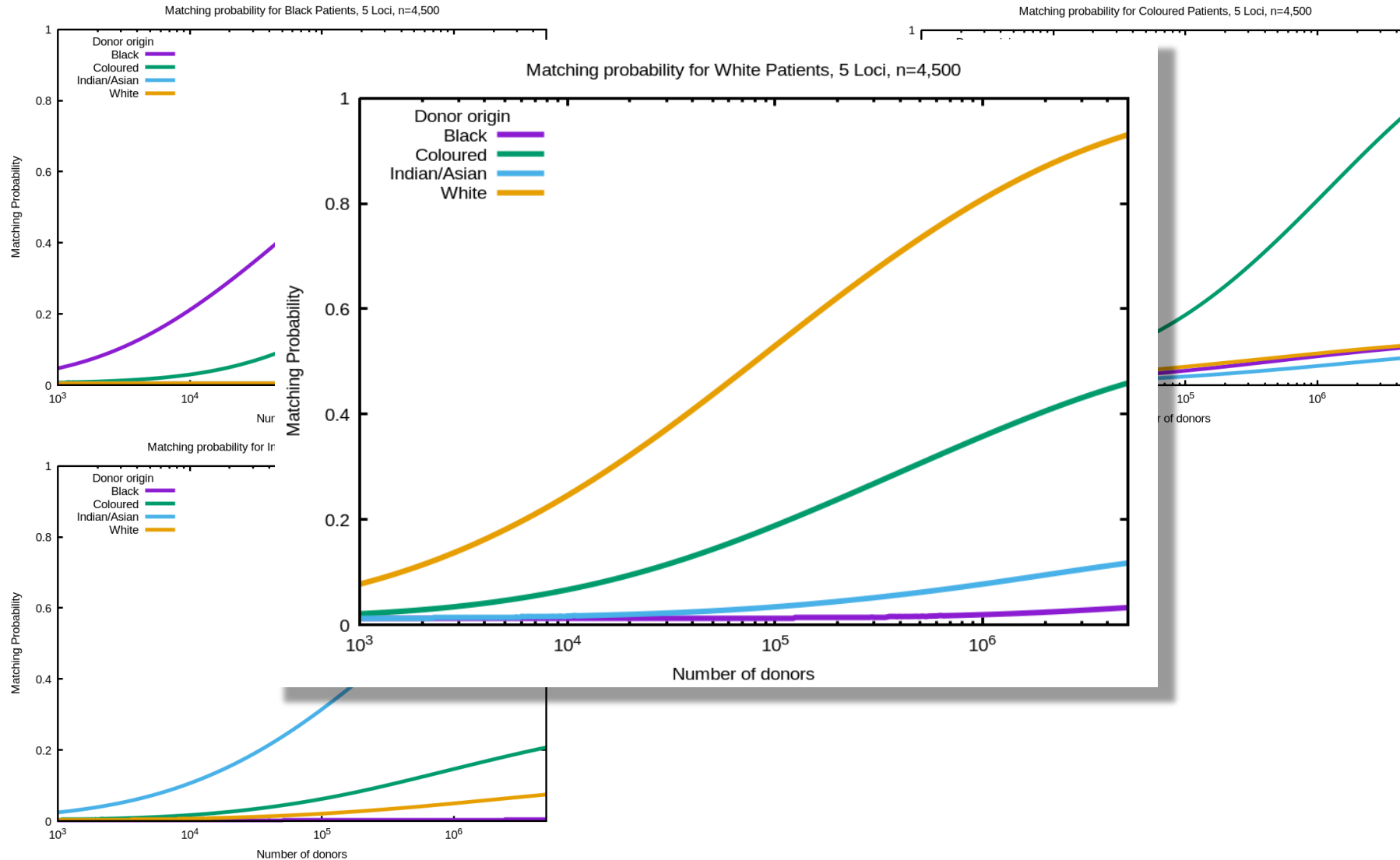
Results: Matching Probabilities



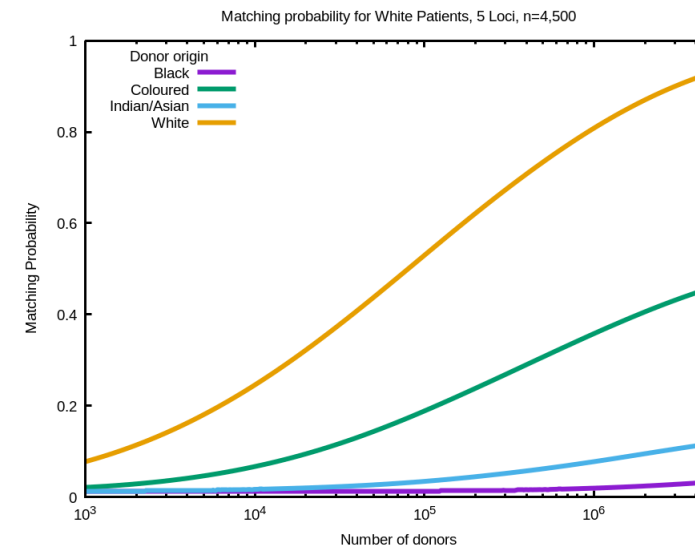
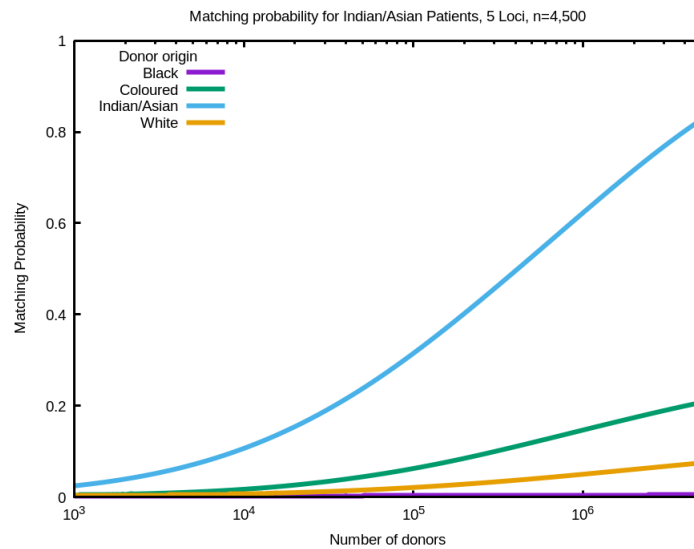
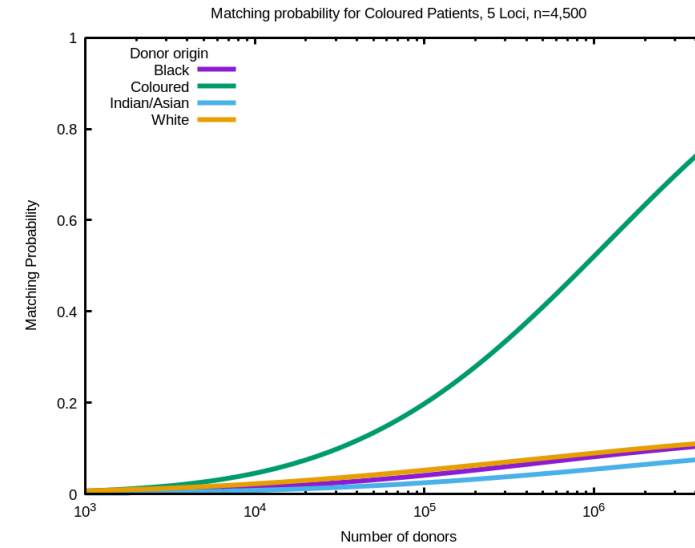
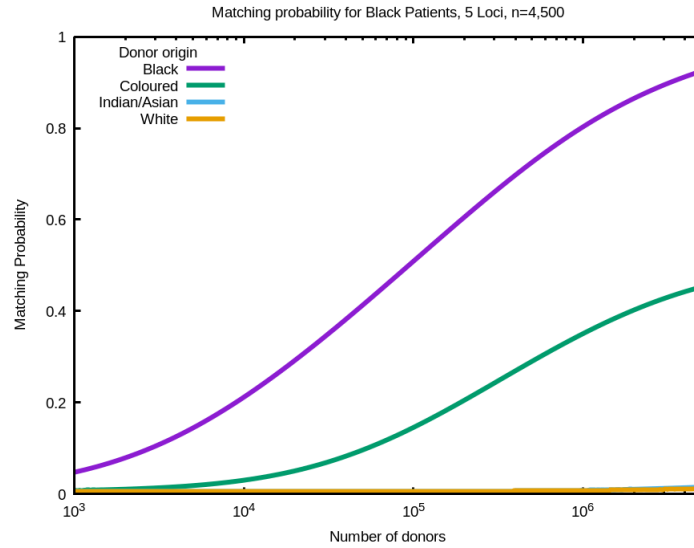
Results: Matching Probabilities



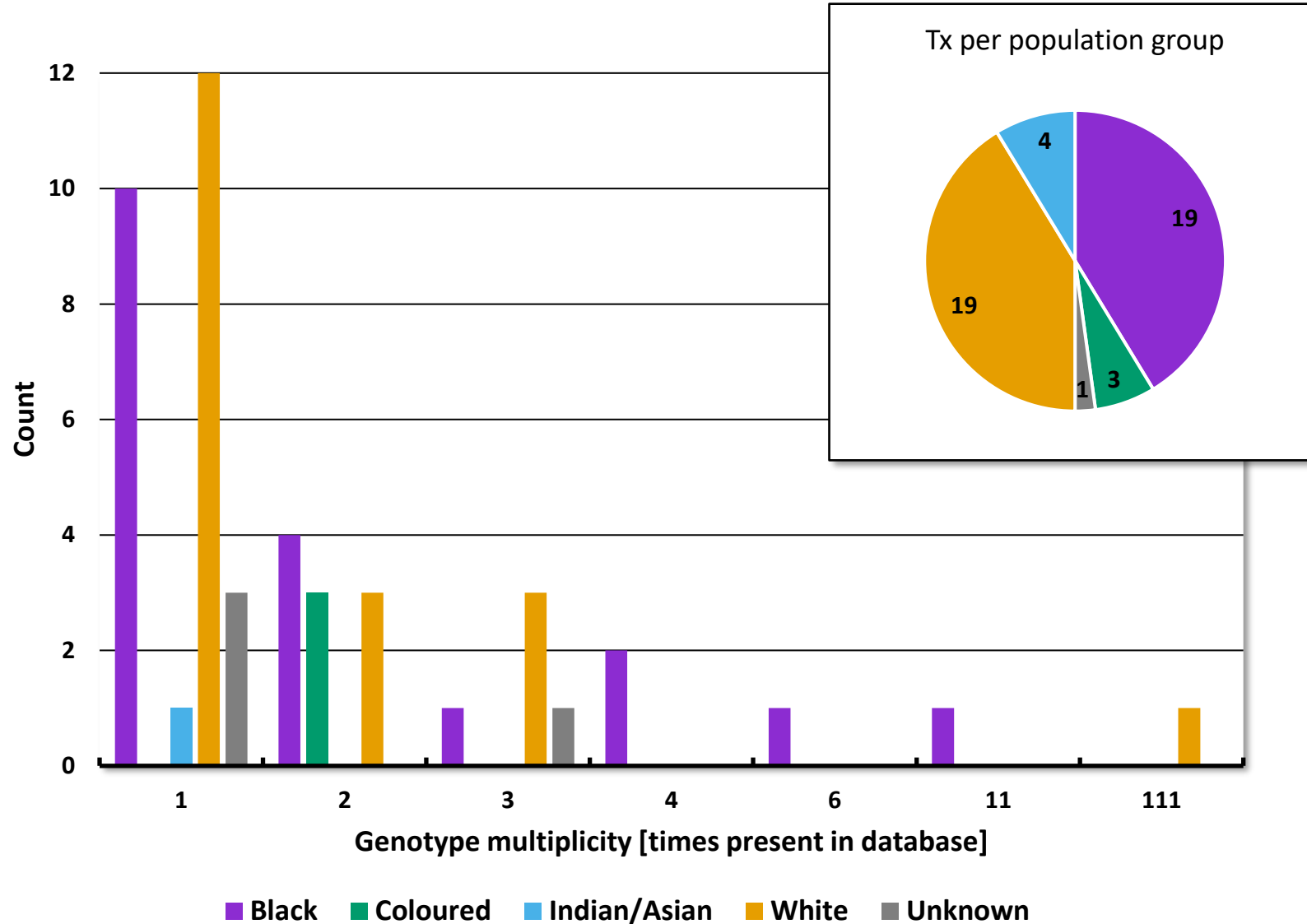
Results: Matching Probabilities



Results: Matching Probabilities



Observations: Collections at DKMS Africa



Summary and Conclusions

- High-resolution haplotype frequencies for four population groups in South Africa
- Largest study cohort, so far
- Self-assigned ethnic origin clearly reflected in haplotype frequencies and genetic distances
- Donor recruitment among Blacks greatly benefits this population group
- Tx data reflects high matching probabilities
- Also, haplotype frequencies are in good agreement with earlier publications

Thank You!

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