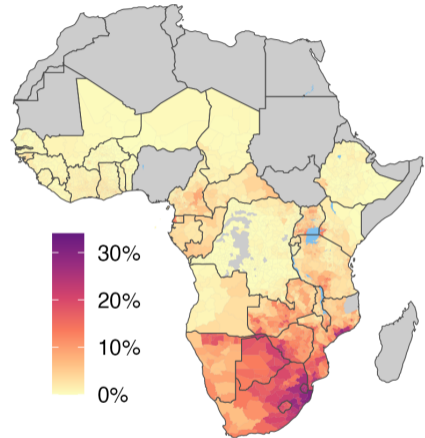
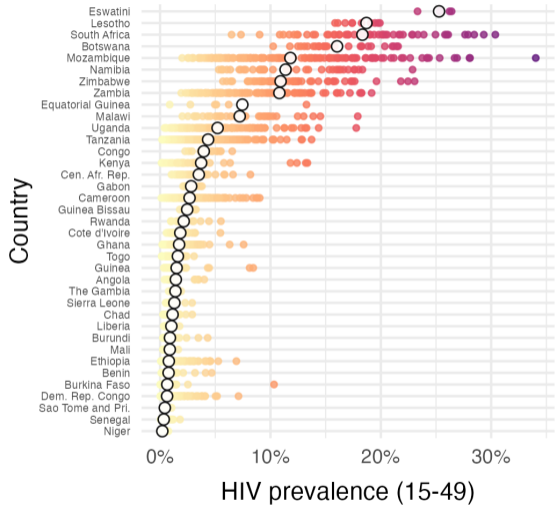


Bayesian spatio-temporal methods for small-area estimation of HIV indicators

Adam Howes

Imperial College London

March 2023



Source: UNAIDS Naomi model estimates, 2023

Proportional to number of neighbours

Average of neighbours

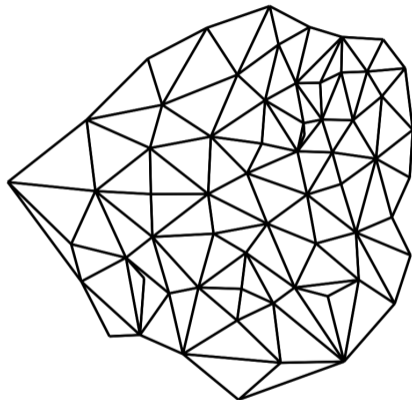
$$u_i | \mathbf{u}_{-i} \sim \mathcal{N} \left(\frac{1}{n_{\delta i}} \sum_{j:j \sim i} u_j, \frac{1}{n_{\delta i} \tau_u} \right)$$

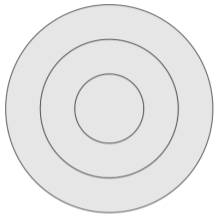
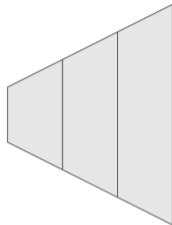
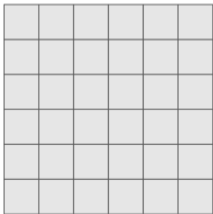
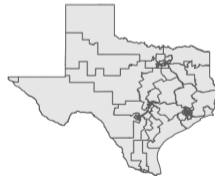
*i*th full conditional

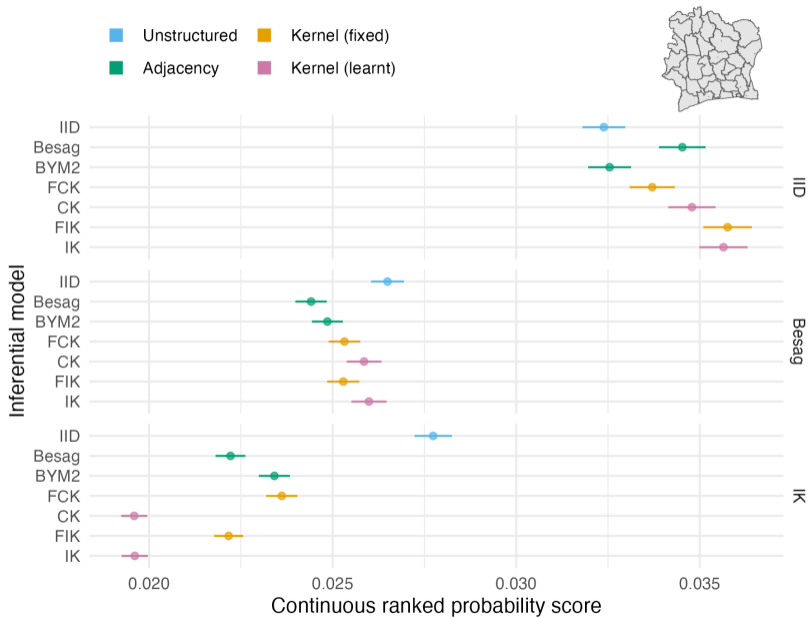
A

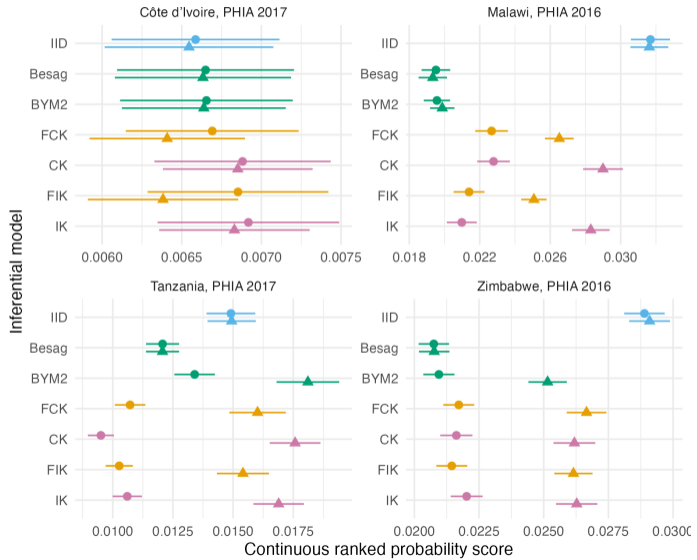
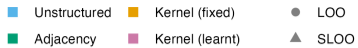


B



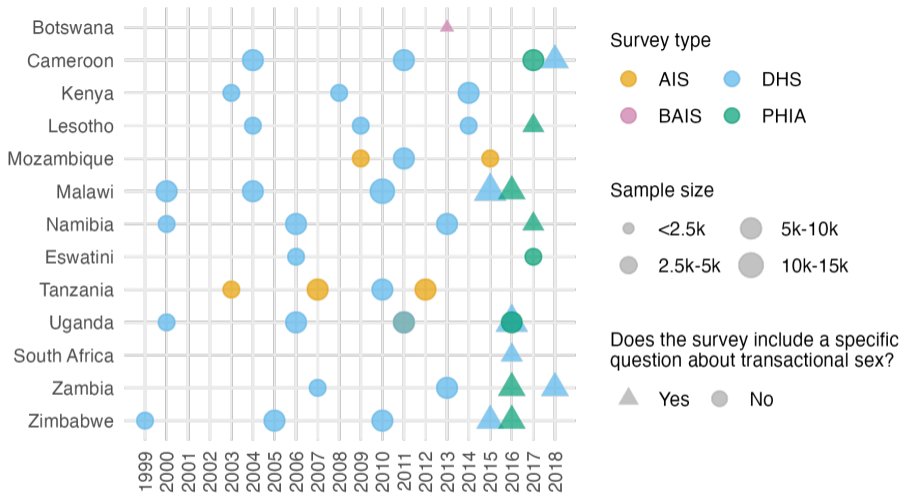
A**B****C****D****E****F****G**



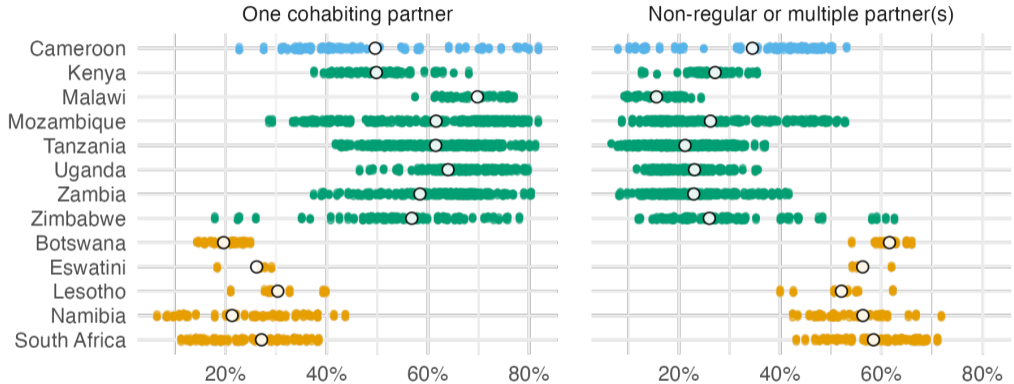


GLOBAL AIDS STRATEGY 2021-2026
**END INEQUALITIES.
END AIDS.**

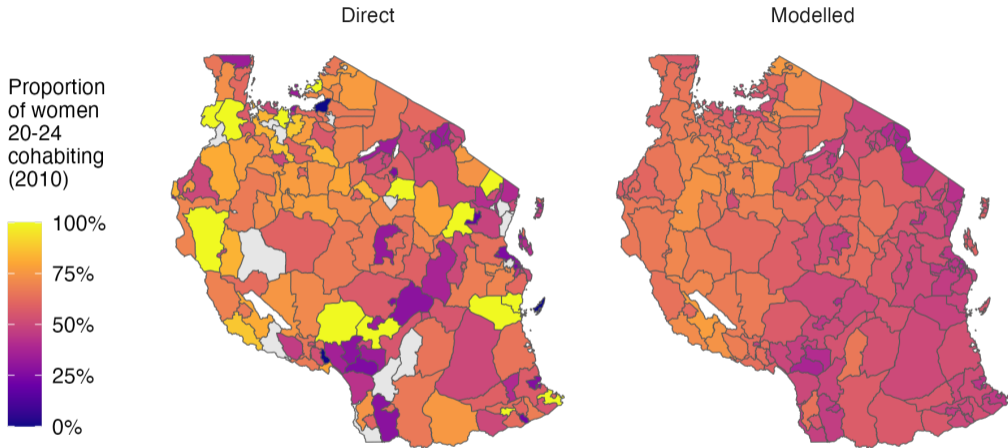


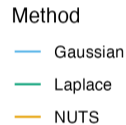
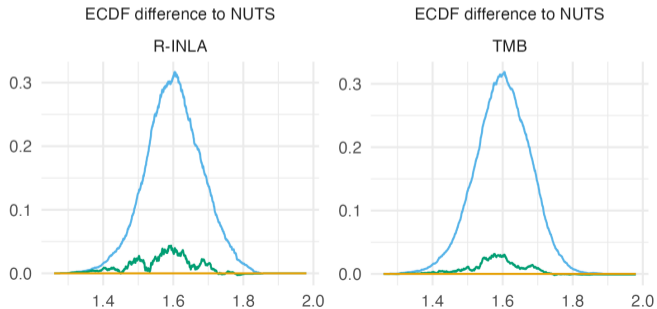
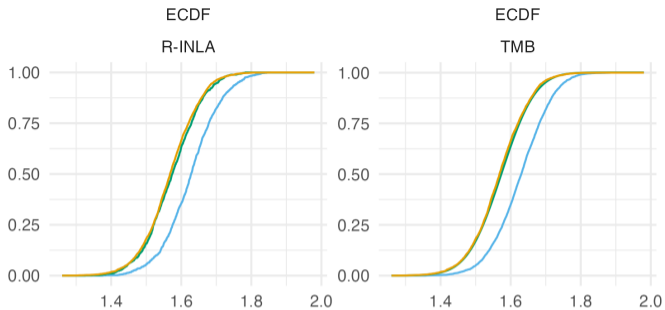


Regions of sub-Saharan Africa ● Central ● Eastern ● Southern

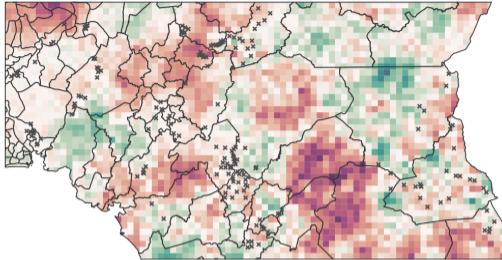


Not sexually active (not shown) + one cohabiting partner + non-regular or multiple partner(s) + FSW (not shown) = 100%

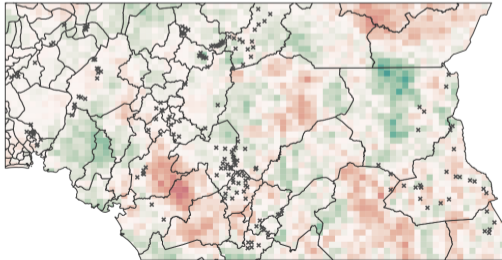




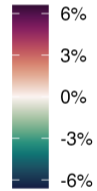
Gaussian



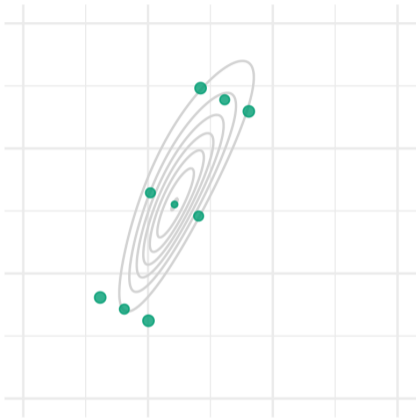
Laplace



Prevalence
difference
to NUTS

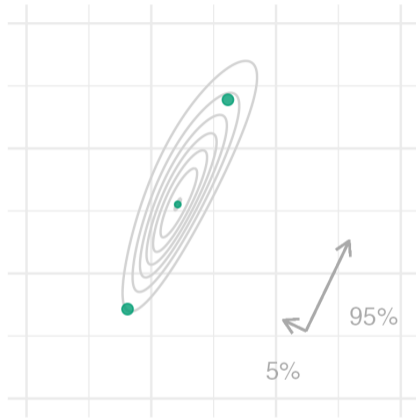


A

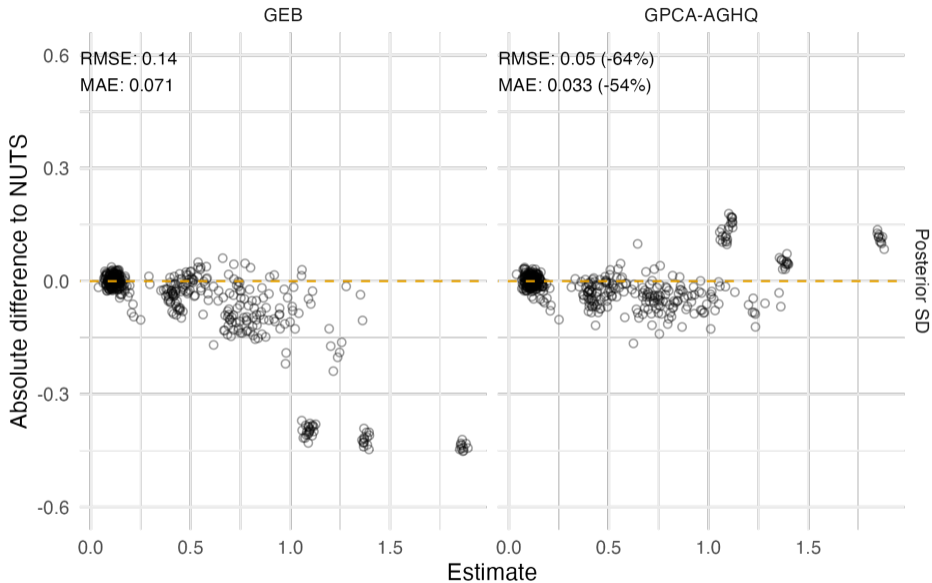


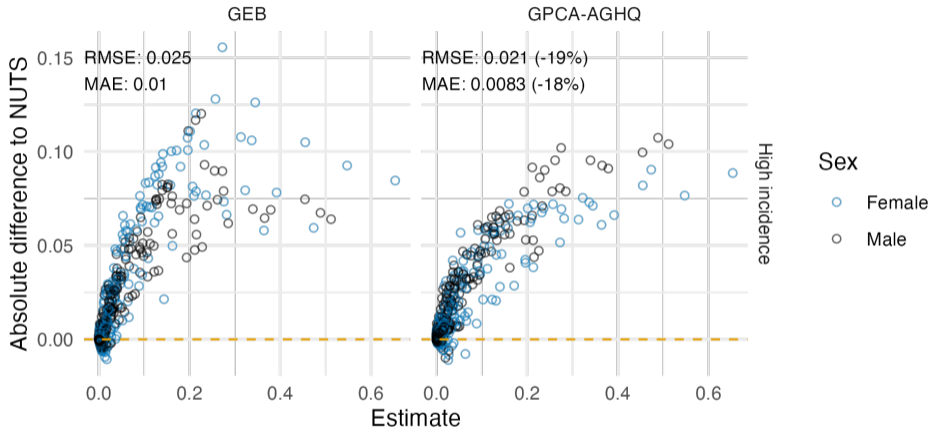
AGHQ (spectral)

B



PCA-AGHQ





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Jeff Eaton	Harvard, Imperial
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