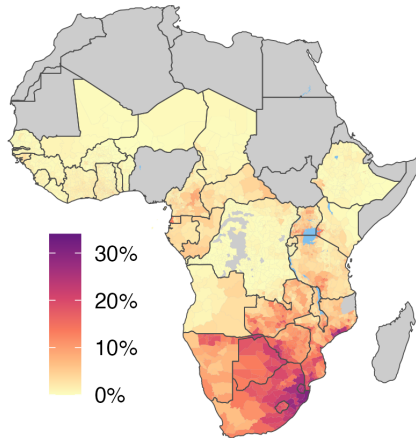
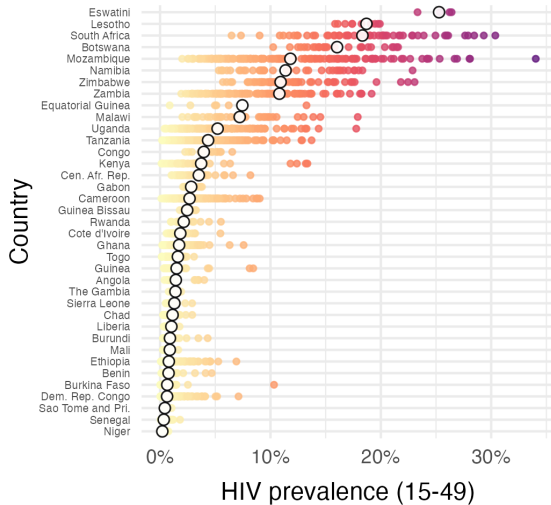


Bayesian spatio-temporal methods for small-area estimation of HIV indicators

Adam Howes

Imperial College London

December 2023



Source: UNAIDS Naomi model estimates, 2023

Proportional to number of neighbours

Average of neighbours

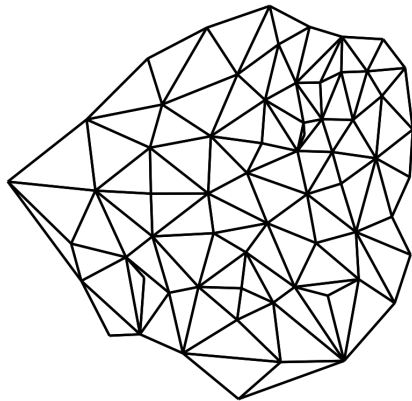
$$u_i \mid \mathbf{u}_{-i} \sim \mathcal{N} \left(\frac{1}{n_{\delta i}} \sum_{j:j \sim i} u_j, \frac{1}{n_{\delta i} \tau_u} \right)$$

i th full conditional

A



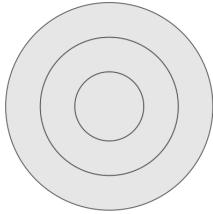
B



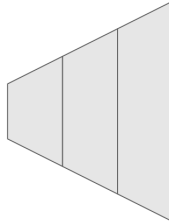
A



B



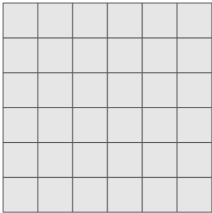
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D



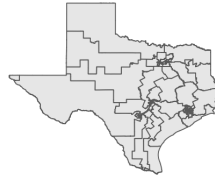
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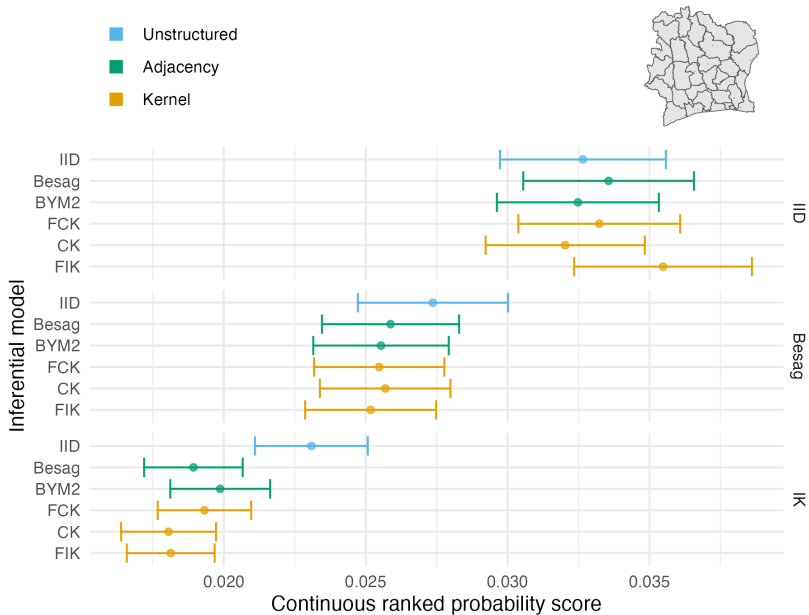


F



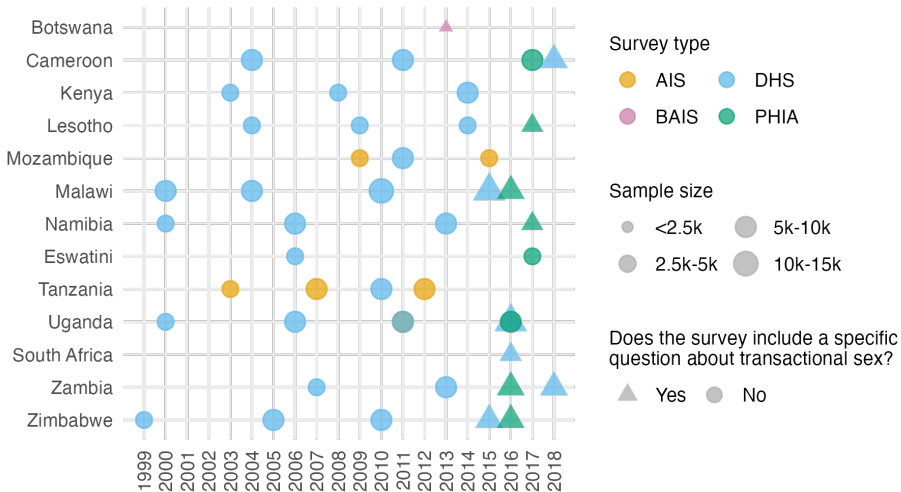
G

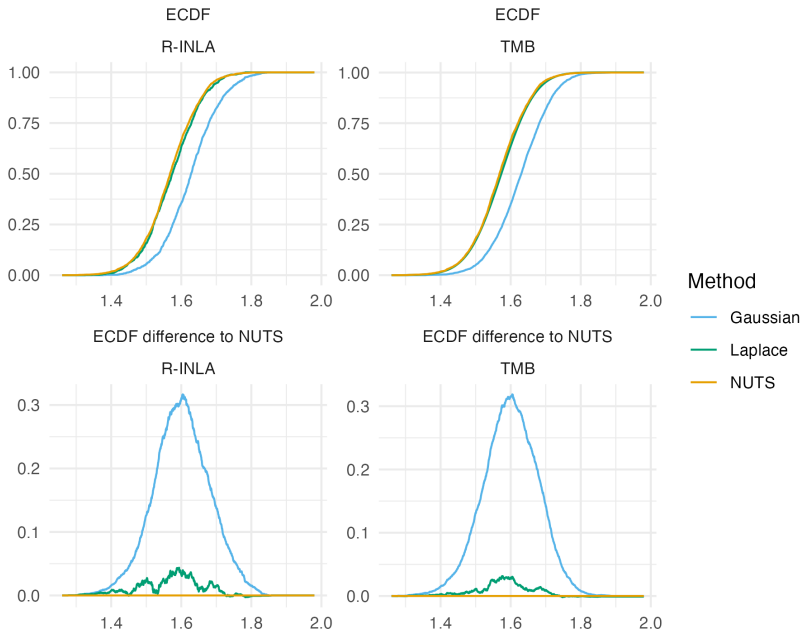




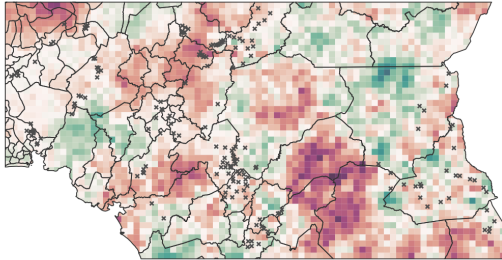
GLOBAL AIDS STRATEGY 2021-2026
**END INEQUALITIES.
END AIDS.**



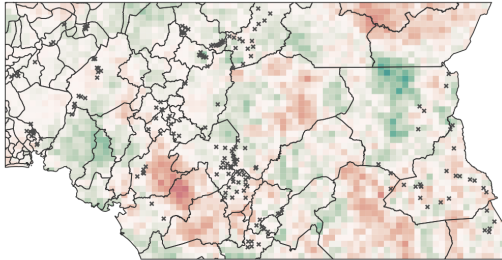




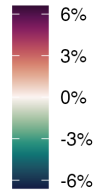
Gaussian



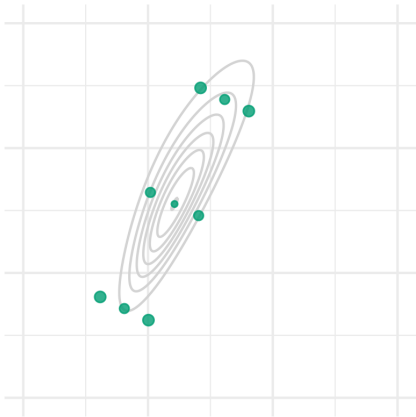
Laplace



Prevalence
difference
to NUTS

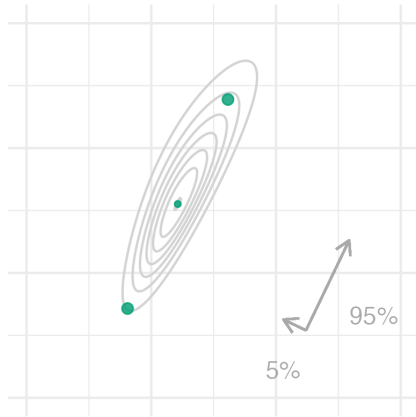


A



AGHQ (spectral)

B



PCA-AGHQ

Acknowledgements

Collaborator	Affiliation
Jeff Eaton	Harvard, Imperial
Seth Flaxman	Oxford
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HIV Inference Group	Imperial
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References I