

## The Geography of HIV/AIDS infection in Botswana

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**Background:** Botswana's HIV/AIDS epidemic is unprecedented in magnitude and impact. For two decades starting during the early 1990s, HIV infection rates in this country of less than two million people have grown tremendously. While the impact of HIV/AIDS is clear for all to see, for a number of years, estimating the population based HIV prevalence rate was a big challenge due to absence of data. Most estimates of HIV prevalence relied heavily on estimates derived from sentinel surveillance of pregnant women attending antenatal care.

**Methods:** Approximately 15,000 respondents (54.4.0% female) were asked to give blood for syphilis and HIV testing for the 2008 Botswana AIDS Impact Survey. Samples for HIV testing were dried blood spots on a filter paper card taken from a venous blood specimen. A three-stage testing procedure was used with 10% of the negative samples retested and discordant results tested by Western Blot.

A Bayesian geo-additive mixed model based on Markov Chain Monte Carlo techniques was used to map the geographic distribution of HIV/AIDS prevalence at the 26 districts, accounting for important risk factors.

### Findings:

The overall HIV prevalence was 17.6% in 2008, higher prevalence among females and in cities and town but lower prevalence among professionals. The mean age for men was lower compared to their female counterpart (25.1 years (SD: 19.3 vs. 27.2 years (SD: 20.5)). We observed a U-shape association between age and the prevalence of HIV. Unadjusted/adjusted odds ratios indicate that the highest HIV prevalence was in Selebi-Phikwe [OR & 95% CI: 3.29 (2.17, 4.96)], Sowa [OR & 95% CI: 2.87 (1.51, 5.49)], Francistown [OR & 95% CI: 2.75 (1.83, 4.12)] followed by Chobe, Northeast, Ngamiland South, Central-Serowe, Central-Tutume, Central-Bobonong, Kgalagadi South, Orapa, Central-Mahalapye, Ngamiland North, Gaborone, Lobatse, Jwaneng, Ngwaketse West, Kweneng East, Central-Boteti, Kgatleng, Southern, Barolong, Ghanzi, Southeast districts, with the lowest prevalence in Kgalagadi North, Kweneng West districts.

### Policy Implication

Based on large population cross-sectional household survey, this study shows a clear geographic distribution of the HIV/AIDS epidemic in Botswana with highest incidence of infection is in the east-central districts. Generally, it is most prevalent in the northern and north-eastern districts of the country. HIV prevalence is also quite high in the central districts. The prevalence rate is moderate in the southern districts. It is generally believed that the geographical distribution of the virus is largely explained by trucking route from countries north of Botswana to South Africa and mine districts.

**Keywords:** Botswana, HIV prevalence, geographic location, spatial autocorrelation