# Religion and Risk: HIV and Sexual Behavior by Religious Affiliation across 7 African Countries

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# Abstract

### Background

Although sub-Saharan Africa carries more than 60% of the global HIV burden, wide variations in HIV prevalence exist across the continent. Predominately Muslim West Africa has much lower rates of HIV than parts of Eastern and Southern Africa, which have experienced rapidly increasing epidemic patterns. Researchers have hypothesized that lower rates of sexual risk behaviour among Muslims may account for lower HIV prevalence in West Africa. However, because Muslims universally circumcise, researchers have been unable to disentangle whether the lower rates of HIV in West Africa stem from behavioural factors associated with Islam or universal male circumcision. Furthermore, religious strictures in Christianity, such as monogamy and moral codes relating to premarital sex should similarly constrain risk behaviour in this group. Previous research has not examined the relationship between religion and various risk factors for HIV in sub-Saharan Africa and has not explicitly compared rates of HIV infection among circumcised Christians and circumcised Muslims.

### Methods

Drawing on data from seven countries with Demographic and Health Surveys that contain HIV biomarker data, this research aimed to explore the association among religious affiliation, HIV serostatus and sexual behaviour. The seven countries were selected because at least 15% of the population was either Christian or Muslim and contained data on rates of male circumcision. First, individuals were coded as being Muslim, Christian or other/no religion. Logistic regression models were run on circumcised male Muslims and circumcised male Christians to assess their relative odds of HIV infection controlling for age and country fixed effects. Models were then

adjusted for sexual behaviour (extramarital partners, polygamous union, age at first sex and sexually transmitted infections), and demographic variables (wealth, education, place of residence). Next, separate models were run on sexual behaviour to test the effect of being Muslim or Christian on sexual behaviour patterns (having had an extramarital partner in the past year, being in a polygamous union and age at first sex) controlling for demographic variables.

### Results

Circumcised Christians had significantly higher odds of being infected with HIV and Muslims had a significantly lower odds of being infected with HIV. After controlling for behavioural variables and demographic variables, this association disappeared. Christians were significantly more likely to report having had an extramarital partner and had a lower age at first sex but Muslims were significantly more likely to be in a polygamous union.

### Conclusions

The effect of male circumcision alone is unlikely to explain why predominately Muslim countries have lower rates of HIV infection. Behavioral factors grounded in religious strictures play an additional role in the lower rates of HIV among Muslims. A failure to compare circumcised Christians to circumcised Muslims may lead to confounding in the relationship between religion and HIV infection.

## References

Gray**,** P.B. (2004)**.** HIV and Islam: is HIV prevalence lower among Muslims? *Social Science & Medicine* 58**:** 1751–1756**.**

# Tables

### Table 1 - HIV Infection by Muslim Religion

| HIV Serostatus | (1) Circumcised and Uncircumcised OR (SE) | (2) Circumcised Only OR (SE) | (4) Circumcised Only OR (SE) | (3) Circumcised Only OR (SE) | (5) Circumcised Only OR (SE) |
|---|---|---|---|---|---|
| **Religion** | | | | | |
| Muslim | 0.856** | 0.891** | 0.926 | 0.943 | 0.925 |
| | (0.0641) | (0.0720) | (0.111) | (0.0834) | (0.120) |
| Christian/Other (ref) | ref | ref | ref | ref | ref |
| **Demographics** | | | | | |
| age | 1.038*** | 1.030*** | 1.008 | 1.030*** | 1.002 |
| | (0.00274) | (0.00324) | (0.00660) | (0.00349) | (0.00731) |
| wealth | | | | 1.101** | 1.169** |
| | | | | (0.0488) | (0.0842) |
| no education (ref) | ref | ref | ref | ref | ref |
| primary school | | | | 1.317** | 1.074 |
| | | | | (0.161) | (0.188) |
| secondary plus | | | | 1.268* | 1.152 |
| | | | | (0.172) | (0.236) |
| rural (ref) | ref | ref | ref | ref | ref |
| town | | | | 1.607*** | 1.390* |
| | | | | (0.165) | (0.236) |
| large city | | | | 1.480*** | 1.565** |
| | | | | (0.196) | (0.330) |
| **Sexual Behavior** | | | | | |
| polygamous union | | | 1.316 | | 1.565* |
| | | | (0.281) | | (0.375) |
| extramarital partner, past year | | | 1.188 | | 1.152 |
| | | | (0.161) | | (0.166) |
| self-reported STD (sore) | | | 1.687 | | 1.423 |
| | | | (0.576) | | (0.545) |
| age at sexual debut | | | 0.989 | | 0.992 |
| | | | (0.0153) | | (0.0168) |
| **Country Fixed Effects** | | | | | |
| Burkina Faso | 0.154*** | 0.116*** | 0.117*** | 0.121*** | 0.107*** |
| | (0.0234) | (0.0234) | (0.0315) | (0.0254) | (0.0303) |
| Ivory Coast | 0.418*** | 0.339*** | 0.235*** | 0.311*** | 0.209*** |
| | (0.0449) | (0.0529) | (0.0461) | (0.0512) | (0.0442) |
| Cameroon | 0.365*** | 0.318*** | | 0.267*** | |
| | (0.0362) | (0.0487) | | (0.0434) | |
| Kenya | 0.310*** | 0.177*** | 0.230*** | 0.172*** | 0.205*** |
| | (0.0319) | (0.0297) | (0.0455) | (0.0296) | (0.0429) |
| Tanzania | 0.580*** | 0.470*** | 0.411*** | 0.417*** | 0.383*** |
| | (0.0545) | (0.0716) | (0.0735) | (0.0644) | (0.0702) |
| Ghana | 0.133*** | 0.112*** | 0.142*** | | |
| | (0.0187) | (0.0208) | (0.0312) | | |
| Malawi (ref) | ref | ref | ref | ref | ref |
| Constant | 0.0356*** | 0.0552*** | 0.157*** | 0.0391*** | 0.161*** |
| | (0.00394) | (0.00947) | (0.0572) | (0.00856) | (0.0702) |

| | | | | | |
|---|---|---|---|---|---|
| Observations | 29,607 | 24,060 | 18,326 | 20,115 | 16,570 |

*** p<0.01, ** p<0.05, * p<0.1

**Table 2 - HIV Infection by Christian Religion**

| | (1) | (2) | (4) | (3) | (5) |
|---|---|---|---|---|---|
| HIV Serostatus | Circumcised and Uncircumcised OR (SE) | Circumcised Only OR (SE) | Circumcised Only OR (SE) | Circumcised Only OR (SE) | Circumcised Only OR (SE) |
| **Religion** | | | | | |
| Christian | 1.272*** | 1.161* | 1.070 | 1.079 | 1.005 |
| | (0.0890) | (0.0902) | (0.0912) | (0.125) | (0.128) |
| Muslim/Other (ref) | ref | ref | ref | ref | ref |
| **Demographics** | | | | | |
| age | 1.038*** | 1.030*** | 1.030*** | 1.008 | 1.002 |
| | (0.00275) | (0.00325) | (0.00349) | (0.00660) | (0.00731) |
| wealth | | | | | 1.169** |
| | | | | | (0.0844) |
| no education (ref) | ref | ref | ref | ref | ref |
| primary school | | | | 1.317** | 1.090 |
| | | | | (0.161) | (0.191) |
| secondary plus | | | | 1.268* | 1.180 |
| | | | | (0.172) | (0.241) |
| rural (ref) | ref | ref | ref | ref | ref |
| town | | | | 1.607*** | 1.377* |
| | | | | (0.165) | (0.234) |
| large city | | | | 1.480*** | 1.551** |
| | | | | (0.196) | (0.327) |
| **Sexual Behavior** | | | | | |
| polygamous union | | | 1.318 | | 1.550* |
| | | | (0.282) | | (0.371) |
| extramarital partner, past year | | | 1.188 | | 1.155 |
| | | | (0.161) | | (0.166) |
| self-reported STD (sore) | | | 1.686 | | 1.418 |
| | | | (0.576) | | (0.543) |
| age at sexual debut | | | 0.988 | | 0.991 |
| | | | (0.0153) | | (0.0167) |
| **Country Fixed Effects** | | | | | |
| Burkina Faso | 0.166*** | 0.118*** | 0.118*** | 0.122*** | 0.108*** |
| | (0.0254) | (0.0240) | (0.0318) | (0.0255) | (0.0304) |
| Ivory Coast | 0.449*** | 0.350*** | 0.239*** | 0.315*** | 0.210*** |
| | (0.0497) | (0.0546) | (0.0472) | (0.0516) | (0.0446) |
| Cameroon | 0.372*** | 0.318*** | 0.314*** | 0.268*** | 0.264*** |
| | (0.0369) | (0.0484) | (0.0484) | (0.0431) | (0.0431) |
| Kenya | 0.314*** | 0.176*** | 0.231*** | 0.173*** | 0.211*** |
| | (0.0323) | (0.0295) | (0.0453) | (0.0295) | (0.0437) |
| Tanzania | 0.599*** | 0.471*** | 0.413*** | 0.418*** | 0.385*** |

| | | | | | |
|---|---|---|---|---|---|
| | (0.0566) | (0.0718) | (0.0738) | (0.0645) | (0.0705) |
| Ghana | 0.138*** | 0.112*** | 0.144*** | 0.148*** | 0.147*** |
| | (0.0194) | (0.0208) | (0.0312) | (0.0312) | (0.0312) |
| Malawi (ref) | ref | ref | ref | ref | ref |
| Constant | 0.0281*** | 0.0481*** | 0.147*** | 0.0368*** | 0.154*** |
| | (0.00362) | (0.00836) | (0.0538) | (0.00767) | (0.0664) |
| Observations | 29,607 | 24,060 | 20,115 | 18,326 | 16,570 |

*** p<0.01, ** p<0.05, * p<0.1

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**Table 3 - Sexual Behavior by Religion**

| | Muslim | | Christian | |
|---|---|---|---|---|
| VARIABLES | (1) Extramarital Partner | (2) Polygamous Union | (1) Extramarital Partner | (2) Polygamous Union |
| **Religion** | | | | |
| Muslim | 0.787*** | 2.223*** | | |
| | (0.0295) | (0.225) | | |
| Christian | | | 1.150*** | 0.396*** |
| | | | (0.0414) | (0.0441) |
| Other/none (ref) | ref | ref | ref | ref |
| **Demographics** | | | | |
| age | 0.967*** | 1.083*** | 0.967*** | 1.084*** |
| | (0.00147) | (0.00542) | (0.00147) | (0.00543) |
| wealth | 1.107*** | 0.863* | 1.105*** | 0.911 |
| | (0.0225) | (0.0718) | (0.0225) | (0.0751) |
| no education (ref) | ref | ref | ref | ref |
| primary school | 1.788*** | 1.004 | 1.839*** | 1.053 |
| | (0.0879) | (0.128) | (0.0902) | (0.135) |
| secondary plus | 1.886*** | 0.815 | 1.960*** | 0.829 |
| | (0.102) | (0.144) | (0.105) | (0.147) |
| rural (ref) | ref | ref | ref | ref |
| town | 0.978 | 0.677** | 0.958 | 0.671** |
| | (0.0443) | (0.117) | (0.0432) | (0.116) |
| large city | 1.322*** | 0.616* | 1.303*** | 0.604** |
| | (0.0765) | (0.156) | (0.0752) | (0.154) |
| Country Fixed Effects | | | | |
| Burkina Faso | 1.324** | 3.064*** | 1.344*** | 2.800*** |
| | (0.150) | (0.637) | (0.152) | (0.582) |
| Ivory Coast | 3.055*** | 0.149*** | 3.204*** | 0.126*** |
| | (0.332) | (0.0431) | (0.347) | (0.0362) |
| Cameroon | 2.581*** | 1.306 | 2.697*** | 1.318 |
| | (0.278) | (0.275) | (0.290) | (0.278) |
| Kenya | 1.001 | 0.0812*** | 1.044 | 0.0774*** |
| | (0.108) | (0.0273) | (0.112) | (0.0260) |
| Tanzania | 1.667*** | 0.00337*** | 1.694*** | 0.00755*** |
| | (0.180) | (0.00106) | (0.182) | (0.00223) |
| Malawi (ref) | ref | ref | ref | ref |
| Constant | 0.549*** | | 0.441*** | |
| | (0.0673) | | (0.0527) | |
| Observations | 20,090 | 17,512 | 20,090 | 17,512 |

*** p<0.01, ** p<0.05, * p<0.1

**Table 4 - Age at first Sex by Religion**

| VARIABLES | (1) Age 1st sex | (2) Age 1st sex |
|---|---|---|
| **Religion** | | |
| Muslim | 0.54*** | |
| | (0.072) | |
| Christian | | -0.38*** |
| | | (0.070) |
| Other/None (ref) | ref | ref |
| **Demographics** | | |
| age | 0.11*** | 0.11*** |
| | (0.003) | (0.003) |
| wealth | 0.17*** | 0.18*** |
| | (0.040) | (0.041) |
| no education (ref) | ref | ref |
| primary_school | -0.89*** | -0.92*** |
| | (0.090) | (0.090) |
| secondary_plus | -0.50*** | -0.55*** |
| | (0.101) | (0.101) |
| rural (ref) | ref | ref |
| town | 0.05 | 0.10 |
| | (0.095) | (0.095) |
| large_city | -0.29** | -0.25** |
| | (0.115) | (0.115) |
| **Country Fixed Effects (not shown)** | | |
| Constant | 15.28*** | 15.75*** |
| | (0.147) | (0.139) |
| Observations | 11,750 | 11,750 |
| R-squared | 0.187 | 0.185 |

*** p<0.01, ** p<0.05, * p<0.1