

## Seasonality and male circumcision: an analysis of quarterly PEPFAR-supported voluntary medical male circumcisions, 2016 – 2019

Megan Peck<sup>1</sup>, Anne G. Thomas<sup>2</sup>, Katherine Ong<sup>1</sup>, Todd Lucas<sup>1</sup>, Valerian Kiggundu<sup>3</sup>, Aisha Yansaneh<sup>3</sup>, Amber Prainito<sup>4</sup>, Eniko Akom<sup>5</sup>, Tiruneh Zegeye<sup>6</sup>, Fikirte Yohannes<sup>6</sup>, Elijah Odoyo-June<sup>7</sup>, Leonard Soo<sup>8</sup>, Norah C. Talam<sup>9</sup>, Marcos Canda<sup>10</sup>, Inacio Malimane<sup>10</sup>, Jotamo Come<sup>11</sup>, Nadege Umuhoza<sup>12</sup>, Daimon Simbeye<sup>13</sup>, Koku Kazaura<sup>13</sup>, Phillimon Simwanza<sup>14</sup>, John Mandisarisa<sup>15</sup>, Sinokuthemba Xaba<sup>16</sup>, Mandzisi Mkhontfo<sup>17</sup>, Carlos Toledo<sup>1</sup>



<sup>1</sup>Division of Global HIV & TB, Center for Global Health, CDC; <sup>2</sup>DoD HIV/AIDS Prevention Program, Defense Health Agency; <sup>3</sup>Office of HIV/AIDS, Bureau for Global Health, USAID; <sup>4</sup>Office of the U.S. Global AIDS Coordinator and Health Diplomacy, U.S. Department of State; <sup>5</sup>U.S. Military HIV Research Program (MHRP), Walter Reed Army Institute of Research, Silver Spring, MD, USA. and Henry M. Jackson Foundation for the Advancement of Military Medicine, Bethesda, MD, USA; <sup>6</sup>Division of Global HIV & TB, Center for Global Health, Centers for Disease Control and Prevention, Addis Ababa, Ethiopia; <sup>7</sup>Division of Global HIV & TB, Center for Global Health, Centers for Disease Control and Prevention, Kisumu, Kenya; <sup>8</sup>HIV Biomedical Prevention, United States Agency for International Development, Nairobi, Kenya; <sup>9</sup>U.S. Army Medical Research Unit, Department of Defense, Nairobi, Kenya; <sup>10</sup>Division of Global HIV & TB, Center for Global Health, Centers for Disease Control and Prevention, Maputo, Mozambique; <sup>11</sup>Ministry of Health, Maputo, Mozambique; <sup>12</sup>Division of Global HIV & TB, Center for Global Health, Centers for Disease Control and Prevention, Kigali, Rwanda; <sup>13</sup>Division of Global HIV & TB, Centers for Global Health, Centers for Disease Control and Prevention, Dar-es-Salaam, Tanzania; <sup>14</sup> Eastern Provincial Health Office, Chipata, Zambia; <sup>15</sup>Division of Global HIV & TB, Center for Global Health, Centers for Disease Control and Prevention, Harare, Zimbabwe; <sup>16</sup>Ministry of Health, Harare, Zimbabwe; <sup>17</sup>Division of Global HIV & TB, Center for Global Health, Centers for Disease Control and Prevention, Mbabane, Eswatini.

## BACKGROUND

Since 2007, the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) has supported voluntary medical male circumcision (VMMC) programs in 15 sub-Saharan African countries. Previous reports describe a seasonal pattern to VMMCs with a considerable increase during specific months every year (1). Factors that contribute to VMMC seasonality include VMMC client's personal preferences and considerations including perceived faster healing in colder months, and seasonal agricultural work (2-3). To understand the seasonal patterns of VMMC programs across prioritized countries, this analysis evaluated the association between season and the number of VMMCs performed during 2016-2019, and variations by country and region in sub-Saharan Africa

## METHODS

PEPFAR monitoring, evaluation, and reporting (MER) data were analyzed from 14 countries including Botswana, Eswatini, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Uganda, Zambia and Zimbabwe. Descriptive statistics characterize the calendar-year quarter during which the most VMMCs were performed each year, by country and region. To assess the statistical significance of the association between season and the number of VMMCs performed by quarter, multilevel generalized linear regression models were fitted for each country. Precision of estimates were characterized with 95% confidence intervals (CIs), with a P value of < 0.05 considered statistically significant.

## RESULTS

Six of the 14 countries (42.8%), Botswana, Eswatini, Malawi, Mozambique, Zambia, and Zimbabwe, had the same quarter perform the highest number of VMMCs annually from 2016 – 2019 (Figs. 1 & 2). Among these 6 countries, there was a statistically significant association between the increase in the number of VMMCs performed and the corresponding highest performing quarter (Table 1).

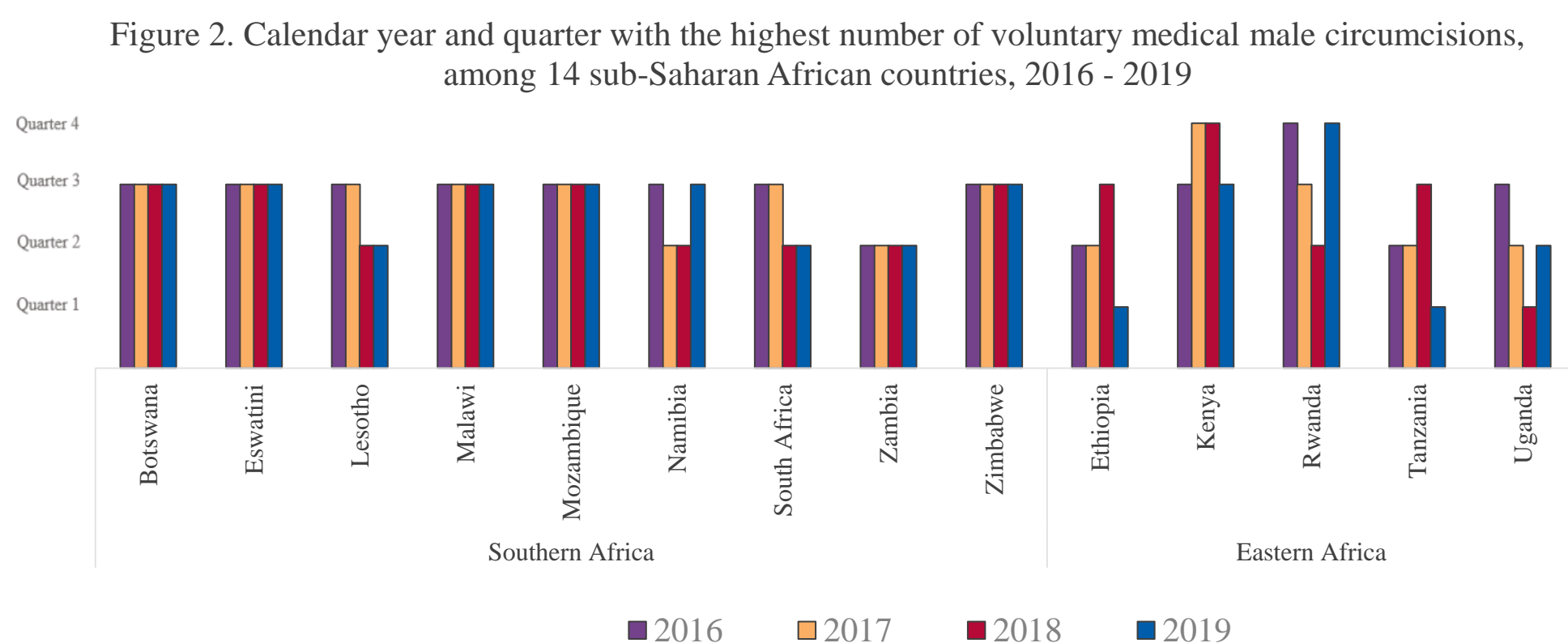
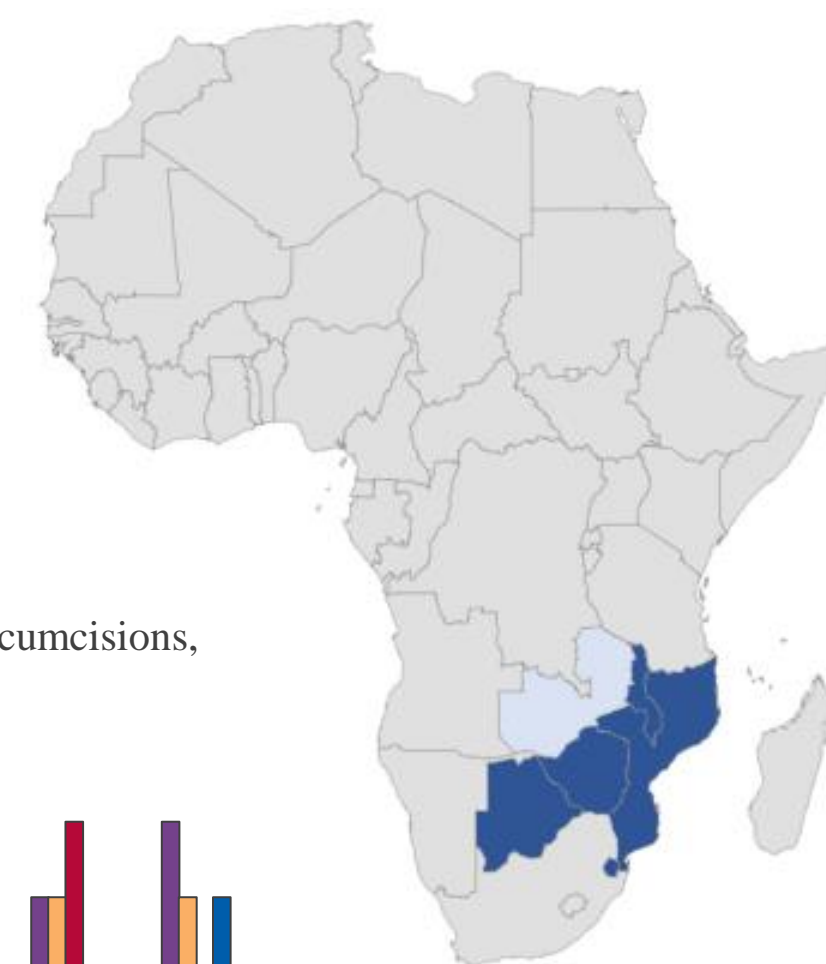


Figure 2. Calendar year and quarter with the highest number of voluntary medical male circumcisions, among 14 sub-Saharan African countries, 2016 - 2019

Figure 1. 6 VMMC priority countries performed the highest number of VMMCs in Quarter 2 (January – March) and Quarter 3 (April – May)



## CONCLUSIONS

These results indicate that there is a tendency towards a higher number of VMMCs conducted in April – June and July – September, particularly among countries in Southern Africa. It is important to consider seasonality during VMMC program planning to ensure that there is an appropriate distribution of labor and resources according to demand and that coverage goals can be met.

## REFERENCES

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Country	VMMC Performance							
	Quarter 1 (January – March)		Quarter 2 (April – June)		Quarter 3 (July – September)		Quarter 4 (October – December)	
	Coefficient (95% CI)	P-value	Coefficient (95% CI)	P-value	Coefficient (95% CI)	P-value	Coefficient (95% CI)	P-value
<b>Southern African Region</b>								
Botswana	Ref	Ref	3,264.7 (181.6, 6,347.8)	0.30	8,670.0 (5,586.8, 11,753.1)	<.0001	3,148.2 (134.8, 6,431.3)	0.06
Eswatini	Ref	Ref	1,855.2 (1,121.5, 2,588.9)	0.14	2,489.2 (1,755.5, 3,222.9)	<.0001	-395.5 (-1,129.2, 338.2)	0.32
Lesotho	Ref	Ref	3,711.2 (450.7, 6,971.7)	0.02	5,299.7 (2,039.2, 8,560.2)	<.0001	1,308.5 (-45,68.9, 1,951.9)	0.43
Malawi	Ref	Ref	9,106.75 (-16,68.2, 19,881.7)	0.09	44,748.7 (33,973.7, 55,523.7)	<.0001	3,954.0 (-6,820.9, 14,728.9)	0.47
Mozambique	Ref	Ref	12,463.0 (-9,850.3, 34,776.3)	0.27	26,034.5 (3,721.1, 48,347.8)	0.02	1,504.5 (-20,808.8, 23,817.8)	0.89
Namibia	Ref	Ref	9,266.5 (5,323.5, 13,209.4)	<.0001	7,776.7 (3,833.8, 11,719.6)	<.0001	-126.2 (-4,069.1, 3,816.6)	0.95
South Africa	Ref	Ref	81,426.0 (27,008.8, 135,843.1)	<.0001	76,072.2 (21,655.1, 130,489.4)	<.0001	14,670.2 (-39,746.8, 69,087.3)	0.59
Zambia	Ref	Ref	56,143.2 (18,808.5, 93,477.9)	<.0001	45,162.0 (-7,827.3, 82,496.6)	0.21	29,823.7 (-7,510.9, 67,158.4)	0.11
Zimbabwe	Ref	Ref	17,637.2 (-5,555.6, 40,830.1)	0.13	28,793.7 (5,600.8, 51,986.6)	0.01	1,073.5 (-22,119.3, 24,266.3)	0.92
<b>Eastern African Region</b>								
Ethiopia	Ref	Ref	1,612.7 (-1,701.3, 4,926.8)	0.34	1,671.0 (-1,643.0, 4,985.0)	0.32	1,613.7 (-4,927.8, 1,700.3)	0.34
Kenya	Ref	Ref	43,593.7 (-19,799.5, 67,387.9)	0.07	49,277.7 (25,483.5, 73,071.9)	<.0001	61,599.0 (37,804.8, 85,393.1)	<.0001
Rwanda	Ref	Ref	21,924.2 (-463.0, 43,385.4)	0.40	11,559.7 (-9,901.4, 33,020.9)	0.29	14,694.2 (-67,66.9, 36,155.4)	0.18
Tanzania	Ref	Ref	31,641.2 (-33,461.2, 96,743.7)	0.34	12,197.5 (-77,300.0, 52,905.0)	0.71	45,102.5 (-110,205, 20,000.0)	0.17
Uganda	Ref	Ref	29,742.2 (-45,342.4, 104,827.0)	0.43	34,185.0 (-40,899.7, 109,269.7)	0.37	13,297.7 (-88,382.4, 61,786.9)	0.72

