



**USAID**  
FROM THE AMERICAN PEOPLE

**USAID**  
**ASSIST PROJECT**  
*Applying Science to Strengthen  
and Improve Systems*

## **Voluntary Medical Male Circumcision Improvement Data Validation in South Africa**

### **Introduction**

All available evidence indicates that male circumcision reduces the risk of HIV transmission (1-4). Therefore, the United States President's Emergency Plan for AIDS Relief (PEPFAR) supports implementation of voluntary male medical circumcision (VMMC) in many high prevalence countries, including South Africa, as one of several ways to address the epidemic (5-8). To maximize prevalence of circumcisions, it is important to optimize the quality of performance of the procedure for a better patient experience and to reduce risks of adverse events (9-11).

With PEPFAR funding, the United States Agency for International Development (USAID) Applying Science to Strengthen and Improve Systems (ASSIST) Project implemented a continuous quality improvement (CQI) program in South Africa from 2014 to 2016 to optimize quality performance among clinicians providing voluntary male circumcision under USAID and U. S. Center for Disease Control and Prevention (CDC) programs. The VMMC CQI program, as with all modern quality improvement initiatives, relies on accurate data on indicators of service delivery performance to drive changes in processes of care for optimal results. For this reason, it is important for those implementing CQI to understand the quality of data they are using and implement corrective actions if deficits in data accuracy are detected. This report discusses an evaluation of data quality conducted from June 2014 to December 2016 and outlines efforts made to improve data quality during that period.

There is a mandate from PEPFAR to conduct data quality assessments for VMMC work. The South African Department of Health (DOH) also has a mandate to check the validity of data reported to it. However, in almost all sites participating in this intervention, there was little evidence they were conducted. In cases where there was evidence of data checks, that process focused on data reported as compared to the source documents which were generally facility registers. They did not check if the source document was an accurate representation of the care delivered to the patients.

The VMMC CQI program was implemented by USAID ASSIST in seven South African provinces: Limpopo, Mpumalanga, North West, Gauteng, Western Cape, Eastern Cape, and KwaZulu Natal. More than 121 sites that provide VMMC were included in the intervention of which 45% were supported by CDC funding and 55% were supported by USAID funds. During the period, some new sites were added while others closed. The sites were supported by four implementing partners (IPs) that were responsible for helping the sites to perform VMMC to the standards set by PEPFAR. The USAID ASSIST Project worked through these IPs who had the direct contact with the clinical staff performing the circumcisions.

The ASSIST CQI work focused on compliance with eight VMMC quality standards defined by the World Health Organization (WHO): leadership and planning, management systems, group education, individual counselling and testing, monitoring and evaluation (M&E), infrastructure, surgical procedure, and infection prevention. Some sites also requested the USAID ASSIST Project to advise on reaching VMMC

JUNE 2018

This short report was prepared by University Research Co., LLC (URC) for review by the United States Agency for International Development (USAID) and authored by Edward Broughton of URC under the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project. USAID ASSIST is managed by URC under the terms of Cooperative Agreement Number AID-OAA-A-12-00101. URC's global partners for USAID ASSIST include: EnCompass LLC; FHI 360; Institute for Healthcare Improvement; Johns Hopkins Center for Communication Programs; and WI-HER, LLC. The contents of this report are the sole responsibility of URC and do not necessarily reflect the views of USAID or the United States Government. For more information on the work of the USAID ASSIST Project, please visit [www.usaidassist.org](http://www.usaidassist.org) or write [assist-info@urc-chs.com](mailto:assist-info@urc-chs.com).

coverage targets. USAID ASSIST Project assistance involved experts in improvement methods and VMMC visiting participating site to provide technical support and mentorship to clinicians involved in VMMC service delivery. They did this on a monthly basis.

## Method

The data validation exercise was carried out in the 23 sites listed in **Table 1**; in all, 460 records were examined. The 23 were selected out of the approximately 121 participating sites. They were selected so that every implementing partner had at least five of their participating facilities represented in the sample. A sample of 20 patient records were collected by random selection from among all of the records of patients who attended the clinic for a VMMC procedure during the three months prior to the assessment visit.

Data was collected during the CQI assessment visits. The data validation team consisted of at least two improvement experts working for the USAID ASSIST Project. The team traveled to the facility and spent approximately half the day gathering the data used here in the analysis.

The indicators examined were: age, signed informed consent for VMMC available, HIV status noted, vital signs (temperature, weight, and blood pressure) and sexually transmitted disease screening noted, circumcision procedure noted, anesthetic dosing noted, intra-operative adverse events noted, follow-up visits noted/scheduled, and screening for post-operative adverse events noted. These items were marked as included or not in the data collection form. Each data collection form was entered into an Excel spreadsheet at the end of the data collection day. Files were transferred to STATA V13 for final analysis.

**Table 1. CQI-supported sites included in the data validation exercise**

#	Name of the site
1	Bela bela
2	Benedictine
3	Bertha Gxowa
4	Botlokwa
5	Carltonville
6	Chiawelo
7	Dr George Mukhari
8	Grassypark
9	Mankweng
10	Mondlo
11	Mount Alyff
12	Mseleni
13	Orange Farm
14	Palmerton
15	Phola Ntsikazi
16	Seshego
17	Soshanguve
18	Themba
19	Tongaat
20	Tshepong
21	Voortrekker
22	Woodstock
23	Zola

## Results

The data validation findings are organized by the three areas addressed by the exercise:

- 1) Reviewing VMMC clients records for completeness of documentation of the key elements.
- 2) Comparing data summarized in the VMMC registers and the HIV counseling and testing (HCT) registers with the monthly summary report.
- 3) Exploring some common factors associated with poor documentation of key elements of VMMC.

**Table 2** shows the sample representativeness by province, type of facility, and length of time performing circumcisions.

**Table 2: Sample representativeness**

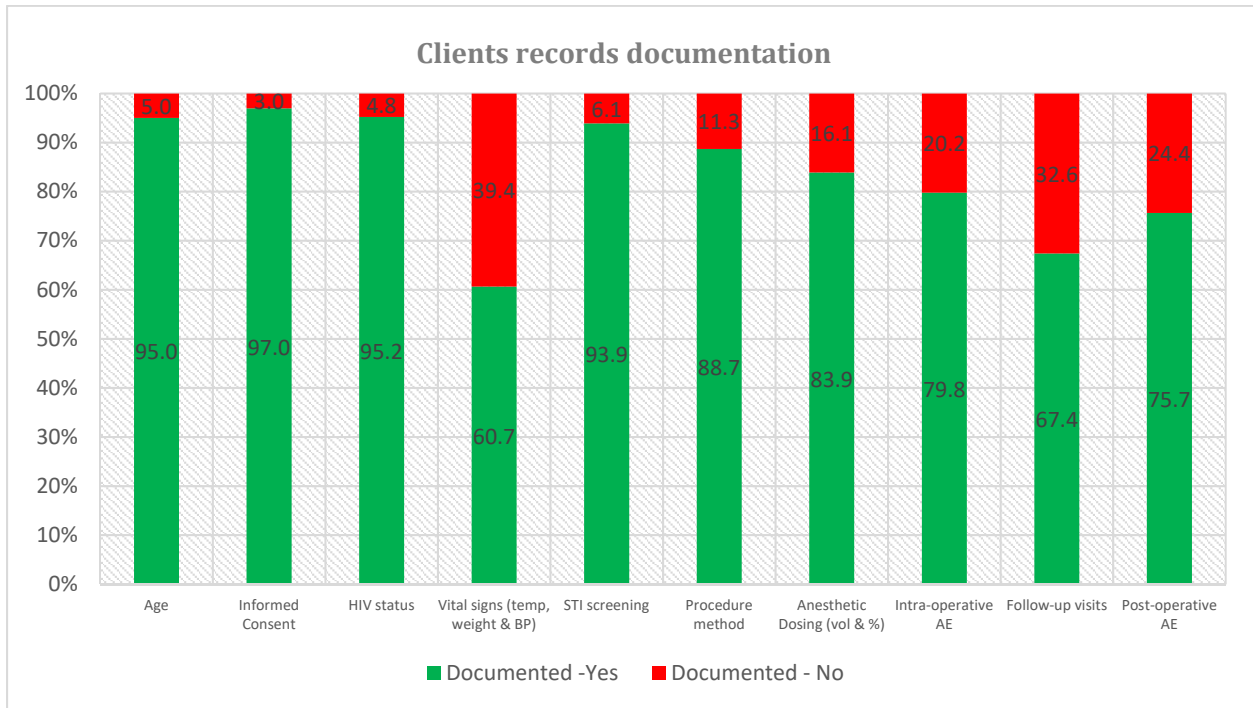
Province	# of Facilities	# of Records	Percent
EC	2	40	8.7
GP	7	140	30.4
KZN	4	80	17.4
LP	5	100	21.7
MP	2	40	8.7
NW	1	20	4.4
WC	2	40	8.7
<b>Total</b>	<b>23</b>	<b>460</b>	<b>100.0</b>
<b>Type of facility</b>			
Type of facility	# of Facilities	# of Records	Percent
CHC	7	140	30.4
Clinic	1	20	4.4
Hospital	14	280	60.9
Private	1	20	4.4
<b>Total</b>	<b>23</b>	<b>460</b>	<b>100</b>
<b>Year started VMMC</b>			
Year started VMMC	# of Facilities	# of Records	Percent
2008	1	20	4.4
2010	5	100	21.7
2011	1	20	4.4
2012	6	120	26.1
2013	7	140	30.4
2014	3	60	13.0
<b>Total</b>	<b>23</b>	<b>460</b>	<b>100</b>

**Indicator 1: Documentation of key VMMC elements in the clients' records**

**Figure 1** shows the percentage of records reviewed which included documentation of 10 key VMMC elements. Four elements were documented in fewer than 80% of the records reviewed: vital signs (documented in 60.7% of records reviewed; follow-up visits (documented in 67.4% of records); post-operative adverse events (AEs) (documented in 75.7% of records); and intra-operative AEs (documented in 79.8% of records).

**Figure 2** presents the same information by site. Only five of the 23 sites scored poor or fair on more than four elements.

**Figure 1: Clients records documentation by key element**



**Figure 2: Clients records documentation of key elements by site**

Name	Age	Informed Consent	HIV status	Vital signs (temp, weight & BP)	STI screening	Procedure method	Anesthetic Dosing (vol & %)	Intra-operative AE	Follow-up visits	Post-operative AE
Site A	100	100	100	0	100	100	100	95	100	0
Site B	95	100	100	85	60	60	60	60	0	95
Site C	100	100	100	5	100	100	100	90	95	100
Site D	100	100	90	85	100	100	100	100	85	95
Site E	100	100	100	5	100	95	100	100	60	100
Site G	100	65	75	90	95	100	100	95	80	50
Site H	100	100	100	75	100	100	50	100	45	50
Site I	95	95	95	50	95	90	95	95	95	90
Site J	100	90	60	80	100	100	100	75	40	95
Site K	100	100	80	40	35	35	35	35	10	25
Site L	100	100	100	100	100	75	75	75	75	75
Site M	80	95	95	85	100	90	100	20	25	70
Site N	100	100	100	100	100	100	100	100	100	100
Site O	100	100	100	100	95	90	100	100	100	95
Site P	95	100	100	100	100	100	100	80	95	95
Site Q	95	100	100	100	100	100	100	90	50	100
Site R	95	95	95	50	95	90	95	95	95	90

Site S	100	95	100	85	90	95	95	65	90	90
Site T	100	100	100	100	100	100	40	100	80	95
Site U	100	100	100	10	100	100	80	85	55	85
Site V	100	100	100	0	95	90	100	80	70	75
Site W	30	95	100	0	100	35	5	5	10	5
Site X	100	100	100	50	100	95	100	95	95	65
Total	95	97	95	61	94	89	84	80	67	76

<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Better</b>
<60%	60-75%	75-90	≥90%

### Indicator 2: Accuracy of summarizing data

**Table 3** shows the number and percentage of sites that demonstrated **accurate** reporting, defined as a difference between the data shown in the VMMC registers for number of clients circumcised and the number shown in the monthly summary report of 5% or less; **over-reporting**, defined as a difference of more than 5% between the number of clients circumcised as shown in the VMMC registers and the monthly summary report; and **under-reporting**, defined as a difference of more than -5% in the number of clients shown in the VMMC registers and the monthly summary report. The percentage of sites characterized as accurately reporting the number of clients circumcised in the monthly summary report varied by month from 65.2% to 73.9%.

**Table 3: Number of clients circumcised – comparing the VMMC registers and monthly summary report for three months**

Period (month)	Summary % difference between VMMC register and monthly summary	% (number) of sites
Month 1	± 5% - Accurate reporting	73.9% (17)
	> +5% - Over-reporting	13.0% (3)
	> -5% - Under-reporting	13.0% (3)
Month 2	± 5% - Accurate reporting	65.2% (15)
	> +5% - Over-reporting	21.7% (5)
	> -5% - Under-reporting	13.0% (3)
Month 3	± 5% - Accurate reporting	69.6% (16)
	> +5% - Over-reporting	21.7% (5)
	> -5% - Under-reporting	8.7% (2)

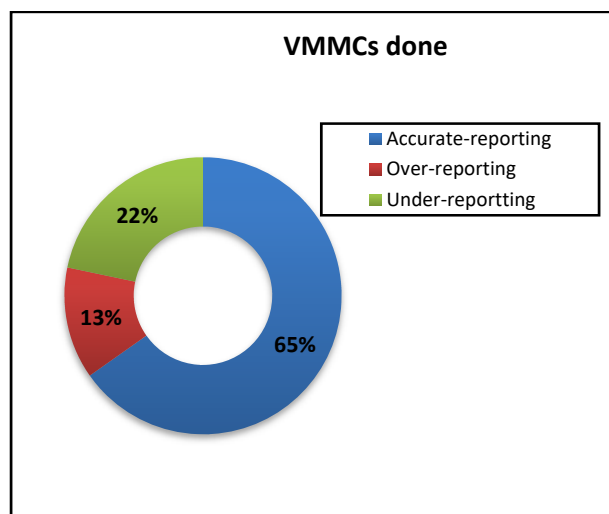
**Table 4** analyzes the difference in number of VMMC clients tested for HIV as shown in the HCT registers versus the monthly summary report. The percentage of sites characterized as accurately reporting the number of VMMC clients tested for HIV varied by month from 28.6% to 100%. It should be noted that three of the 23 sites were missing HCT registers for one of the three months, and two sites were missing HCT registers for all three months.

**Figure 3** shows that for the three months combined, 65% of the sites reported the number of clients circumcised accurately in the monthly report; 22% of the sites under-reported the number of clients circumcised, and 13% over-reported. **Figure 4** shows that for the three months combined, only 9% of the sites accurately reported the number of clients tested for HIV; 65% of the sites under-reported the number of clients tested for HIV, and 13% over-reported.

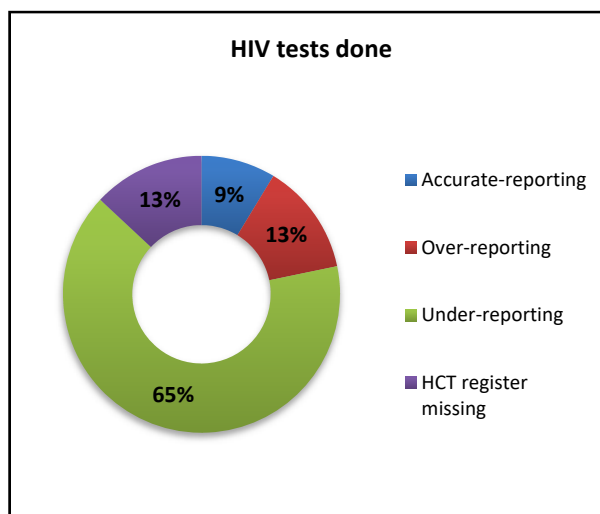
**Table 4: Number of VMMC clients tested for HIV – comparing the HCT registers and monthly summary report for three months**

Period (Month)	% difference between VMMC register and Monthly Summary	% (number) of sites	Comments
Month 1	± 5% - Accurate reporting	30.0% (6)	Missing HCT register 13.0% (3 sites)
	> +5% - Over-reporting	35.0% (7)	
	> -5% - Under-reporting	35.0% (7)	
Month 2	± 5% - Accurate reporting	28.6% (6)	Missing HCT register 8.6% (2 sites)
	> +5% - Over-reporting	38.1% (8)	
	> -5% - Under-reporting	33.3% (7)	
Month 3	± 5% - Accurate reporting	100% (20)	Missing HCT register 13.0% (3 sites)
	> +5% - Over-reporting	0%	
	> -5% - Under-reporting	0%	

**Figure 3: Quarterly VMMC clients circumcised - VMMC registers vs. summary monthly report**



**Figure 4: Quarterly VMMC clients tested for HIV - VMMC registers vs. summary monthly report**



**Exploring the factors associated with poor documentation of key elements of VMMC**

Per **Figures 1 and 2**, the VMMC elements for which sites has the lowest documentation rates were vital signs, post-operative follow-up visits, and adverse events.

**Table 5** shows the characteristics of sites that had lower documentation of vital signs. **Table 6** shows the characteristics of sites that had lower documentation of follow-up visits. **Table 7** shows the characteristics of sites that had lower documentation of intra-operative adverse events.

**Table 5: Characteristics associated with lower documentation of vital signs**

Vital signs				
Province Name	Not documented	Documented	Total	P-value
EC	39.4	60.7	100	0.000
GP	46.4	53.6	100	
KZN	22.5	77.5	100	
LP	47.0	53.0	100	
MP	7.5	92.5	100	
NW	90.0	10.0	100	
WC	75.0	25.0	100	
Year started operation	Not documented	Documented	Total	P-value
2008	0	100	100	0.000
2010	47	53	100	
2011	0	100	100	
2012	35	65	100	
2013	46.4	53.6	100	
2014	45	55	100	
Type of facility	Not documented	Documented	Total	P-value
CHC	12.9	87.1	100	0.000
Clinic	10	90	100	
Hospital	11.4	88.6	100	
Private	0	88.7	88.7	

**Table 6: Characteristics of sites with lower documentation of follow-up visits**

Follow-up visits documentation				
Province Name	Not documented	Documented	Total	P-value
EC	12.5	87.5	100	0.000
GP	18.57	81.43	100	
KZN	71.25	28.75	100	
LP	31	69	100	
MP	7.5	92.5	100	
NW	45	55	100	
WC	47.5	52.5	100	
Year started operation	Not documented	Documented	Total	P-value
2008	0	100	100	0.000
2010	44	56	100	
2011	20	80	100	
2012	33.33	66.67	100	
2013	33.57	66.43	100	
2014	25	75	100	

Type of facility	Not documented	Documented	Total	P-value
CHC	21.4	78.6	<b>100</b>	0.000
Clinic	0	100	<b>100</b>	
Hospital	42.9	57.1	<b>100</b>	
Private	0	100	<b>100</b>	

**Table 7: Characteristics of sites with lower documentation of intra-operative adverse events**

Intra operative adverse events documentation				
Province Name	Not documented	Documented	Total	P-value
EC	12.5	87.5	<b>100</b>	0.000
GP	3.6	96.4	<b>100</b>	
<b>KZN</b>	<b>46.3</b>	53.8	<b>100</b>	
LP	12.0	88.0	<b>100</b>	
MP	27.5	72.5	<b>100</b>	
NW	15.0	85.0	<b>100</b>	
<b>WC</b>	<b>50.0</b>	50.0	<b>100</b>	
Year started operation	Not documented	Documented	Total	P-value
2008	0	100	<b>100</b>	0.000
2010	37	63	<b>100</b>	
2011	0	100	<b>100</b>	
2012	19.2	80.8	<b>100</b>	
2013	19.3	80.7	<b>100</b>	
2014	10	90	<b>100</b>	
Type of facility	Not documented	Documented	Total	P-value
CHC	19.3	80.7	<b>100</b>	0.007
Clinic	0	100	<b>100</b>	
Hospital	23.6	76.4	<b>100</b>	
Private	0	100	<b>100</b>	

## Discussion

This validation exercise examined 460 patient records in 23 facilities of more than 121 facilities participating in the VMMC CQI improvement activities supported by the USAID ASSIST Project.

Results showed many records were missing temperature readings and other vital sign recordings. Clinics with poor results were concentrated in the provinces of Guateng, Limpopo, North West, and Western Cape. Temperature was not taken during pre-assessment in some sites, possibly related to the patient data form not providing a specifically labeled place in the written record to capture that information.

Also, about a third of records did not record follow-up visit information, and therefore no record of adverse events or otherwise from this high proportion of events was available. This is important data for both the individual patient and as an indicator of service delivery performance. For about one fifth of patients, there was no recording of the presence or absence of intra-operative adverse events. Missing adverse event data was particularly high in Kwa-Zulu Natal. About one in 20 charts were missing the age of the patient.



An overall importance finding was that data reported by CQI-supported sites were different to those reported in the source document or primary registers in the clinic. The use of different clients forms within the same facility caused a lack of clarity from the partner about the use of last version.

A finding reported by the ASSIST staff implementing the CQI program was the limited support offered by the DOH staff for data collection and providing feedback on data quality to the implementing partners. There was also limited evidence from the implementing partners of conducting the data quality assessment in the last 3-12 months, as is the USAID recommendation.

The improvement data summarized on the monthly reporting tool for the VMMC and HCT registers showed inconsistency and inaccuracies across all sites on the number of clients circumcised and the number of VMMC clients who received HCT on a month to month basis.

We suggest several reasons for the low levels of completeness achieved by some facilities. One is the clients' preference not to come for post-operative follow-up evaluation and care at the same facility where there were circumcised. Some were reported to have visited other, closer health centers for follow-up, but with no mechanisms in place to track those patients and update the patient record, their medical record at the facility where the circumcision took place remains incomplete.

There are limited mechanisms for verifying data from primary source documents. We think it might be due lack of a standard operating procedure outlining such a practice of data assessment and management at the facilities.

### **Actions to address data deficiencies**

The ASSIST advisors on the CQI activities facilitated implementation of several changes in processes in the delivery of care to improve the quality of data. One change was to provide feedback on data validation findings to the CQI team leader and data clerk responsible for collating and reporting the data. It was explained to them what the deficits in the data were and what the implications were to program performance. The ASSIST advisors worked with sites to development and use data quality control checklists to support good data management. They also addressed specific problems such as the collection of patient temperature and adverse event data.

Another change implemented was to request partners to assign a specific staff member to track follow-up visits made by patients who had had a VMMC but chosen to go to a different facility for follow-up care.

### **Limitations**

One impediment to a full assessment of the quality of the data used in this validation exercise was inaccessibility of patient records. Some facilities did not have all files available, and in some sites we resorted to selecting files that were available to us without applying random selection as planned. It is possible that those unavailable had lower rates of completion. Some of the registers were also missing in some facilities at the time of the assessment.

### **Recommendations**

We suggest the following interventions as ways of improving the validity of the data collected and reported for VMMC activities in these sites.

Sites should:

- Appoint a dedicated staff member to support the partner with VMMC data management

The implementing partner should:

- Develop written standard operating procedures for data management
- Introduce data quality checks at all level of data management

- Conduct data quality assessments including data verification
- Formalize the process of introducing data collection tools and standards operating procedures to all staff involved
- Improve lines of communication with other facilities or with clients themselves to able to capture information on post-operative care

## References

1. Auvert B, Taljaard D, Lagarde E, Sobngwi-Tambekou J, Sitta R, Puren A. Randomized, controlled intervention trial of male circumcision for reduction of HIV infection risk: the ANRS 1265 Trial. *PLoS Med.* 2005;2(11):e298.
2. Bailey RC, Moses S, Parker CB, Agot K, Maclean I, Krieger JN, et al. Male circumcision for HIV prevention in young men in Kisumu, Kenya: a randomised controlled trial. *Lancet.* 2007;369(9562):643-56.
3. Gray RH, Kigozi G, Serwadda D, Makumbi F, Watya S, Nalugoda F, et al. Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial. *Lancet.* 2007;369(9562):657-66.
4. Gray RH, Li X, Kigozi G, Serwadda D, Nalugoda F, Watya S, et al. The impact of male circumcision on HIV incidence and cost per infection prevented: a stochastic simulation model from Rakai, Uganda. *AIDS.* 2007;21(7):845-50.
5. Ashengo TA, Grund J, Mhlanga M, Hlophe T, Mirira M, Bock N, et al. Feasibility and validity of telephone triage for adverse events during a voluntary medical male circumcision campaign in Swaziland. *BMC Public Health.* 2014;14:858.
6. Hatzold K, Mavhu W, Jasi P, Chatora K, Cowan FM, Taruberekera N, et al. Barriers and motivators to voluntary medical male circumcision uptake among different age groups of men in Zimbabwe: results from a mixed methods study. *PLoS One.* 2014;9(5):e85051.
7. Njeuhmeli E, Hatzold K, Gold E, Mahler H, Kripke K, Seifert-Ahanda K, et al. Lessons learned from scale-up of voluntary medical male circumcision focusing on adolescents: benefits, challenges, and potential opportunities for linkages with adolescent HIV, sexual, and reproductive health services. *J Acquir Immune Defic Syndr.* 2014;66 Suppl 2:S193-9.
8. Peltzer K, Onoya D, Makonko E, Simbayi L. Prevalence and acceptability of male circumcision in South Africa. *Afr J Tradit Complement Altern Med.* 2014;11(4):126-30.
9. Carrasco MA, Nguyen TQ, Kaufman MR. Low Uptake of Voluntary Medical Male Circumcision Among High Risk Men in Malawi. *AIDS Behav.* 2016.
10. Kaufman MR, Smelyanskaya M, Van Lith LM, Mallalieu EC, Waxman A, Hatzhold K, et al. Adolescent Sexual and Reproductive Health Services and Implications for the Provision of Voluntary Medical Male Circumcision: Results of a Systematic Literature Review. *PLoS One.* 2016;11(3):e0149892.
11. Kohler PK, Namate D, Barnhart S, Chimbwandira F, Tippet-Barr BA, Perdue T, et al. Classification and rates of adverse events in a Malawi male circumcision program: impact of quality improvement training. *BMC Health Serv Res.* 2016;16:61.

## USAID Applying Science to Strengthen and Improve Systems

University Research Co., LLC • 5404 Wisconsin Avenue • Chevy Chase, Maryland 20815-3594 • USA  
 TEL 301-654-8338 • FAX 301-941-8427 • www.usaidassist.org • assist-info@urc-chs.com