

April 2006

Assessment of Clinical and Traditional Male Circumcision Services in Bungoma District, Kenya:

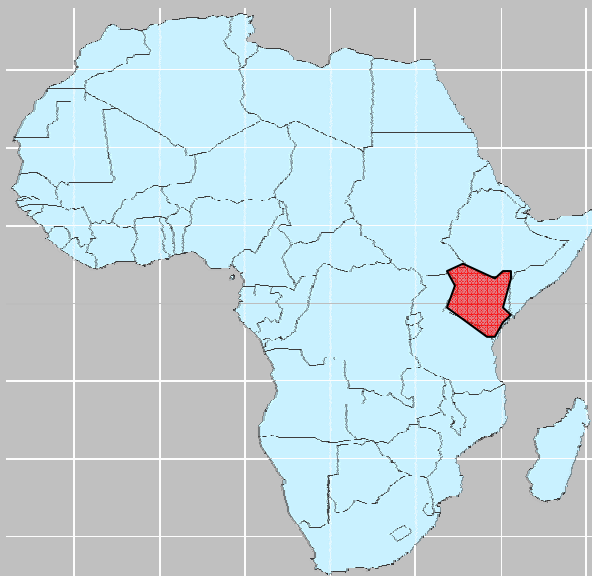
Complications Rates and Operational Needs

APRIL 2006



SPECIAL

REPORT



by
Robert C. Bailey
Omar Egesah



ASSESSMENT OF CLINICAL AND TRADITIONAL MALE CIRCUMCISION SERVICES IN BUNGOMA DISTRICT, KENYA: COMPLICATION RATES AND OPERATIONAL NEEDS

Robert C. Bailey, PhD, MPH
Division of Epidemiology and Biostatistics
School of Public Health
University of Illinois at Chicago
Chicago, IL 60302, USA
e-mail:rcbailey@uic.edu
Tel: 312-355-0440

Omar Egesah, MA
Department of Anthropology
Moi University
Eldoret, Kenya
e-mail: oegesah@yahoo.co.ke



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ACKNOWLEDGMENTS

We are very grateful to Ambrose Juma for his clinical expertise, to Kanuli Mumalasi, Rose Namasaka, Deistaings Nyongesa, Lilly Okelo and George Tenge for their perseverance in the field, to Sara Masibo for assistance with data entry and office management, to Elizabeth Walczak for data management and analyses, and to Nelli Westercamp for her comments and attention to detail in designing this report. We thank the young men and their families who graciously participated in this study.

**Cover Page Photo by Robert C. Bailey
Edited by Nelli Westercamp
Design and layout by Nelli Westercamp**

This report was made possible through support provided by the Global Bureau of Health/HIV-AIDS, U.S. Agency for International Development, under the terms of Award no. HRN-A-00-97-00021-00 and through the AIDSMark Project of PSI. The opinions expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Agency for International Development or PSI.

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1.0 BACKGROUND

Over 40 observational studies and one clinical trial have found that male circumcision (MC) has a protective effect against HIV acquisition of between 40% and 88% (Weiss et al., 1997; Bailey et al., 2001; Siegfried et al., 2003; Auvert et al. 2005). Most recently, Auvert et al. (2005) found in a randomized controlled trial (RCT) in Orange Farm, South Africa, that MC had a protective effect of 60% in intention to treat analysis. When the dissolution effect of cross-overs was taken into account in a per protocol analysis, the protective effect was found to be 76%. Currently, there are two additional RCTs of MC underway in sub-Saharan Africa – one in Rakai, Uganda and the other in Kisumu, Kenya. The results of these two additional trials are expected to be available in 2006-2007. If these trials find MC to be effective in reducing HIV incidence, the results, combined with the evidence from observational studies and biological investigations showing high susceptibility of human foreskin to HIV infection (Patterson et al., 2002, Donoval et al., 2006), are likely to compel the international health community to consider promotion of MC in countries where circumcision is little practiced and the epidemic is primarily among heterosexuals.

However, lack of crucial information concerning the feasibility, safety and costs of implementing MC services is likely to impede progress toward building support for timely introduction of MC as an HIV prevention strategy. History has shown repeatedly, whether in the arena of HIV prevention or other health-related interventions, that the time from discovery to implementation of effective interventions has been tragically long due to the years necessary to collect information crucial for addressing operational issues and for building political will.

There is broad consensus that data on safety and rates of complications will be of central concern in the international health community as MC is considered for promotion as an HIV/AIDS prevention intervention.

The primary concerns of those who are hesitant to implement MC as an HIV prevention strategy in sub-Saharan Africa are likely to be, first, the possibility that MC will detract from other proven HIV prevention interventions and will lead to circumcised men increasing their HIV risk behaviors (i.e., behavioral disinhibition) and, second, feasibility of providing safe, affordable MC services in resource-poor settings. Ample data on behavioral disinhibition will be available from the RCTs, and additional studies are currently underway comparing recently circumcised and uncircumcised men's risk behaviors. However, no reliable information is available concerning rates of complications in clinical or traditional settings in Africa, and little is known about resource and training needs and costs.

Studies of complications from circumcision were given high priority during the September 18-19, 2002 meeting in Washington, DC, sponsored by USAID Office of HIV/AIDS, AIDSMark and JHPIEGO (USAID/ AIDSMark 2003:24-25). The final report states, "Prospective studies to assess complication rates are needed for traditional and clinical MC for adults, adolescents and infants. Priority should be given to the countries where RCTs are underway (Uganda, Kenya,

South Africa).” Studies of complications were also listed among the top priorities for research in the meeting sponsored by The Population Council/Horizons in 2000 (van Dam and Anastasi 2002) and were a concern in a WHO-sponsored meeting in Durbin, South Africa. Addressing the technical and operational requirements for providing safe circumcision services in African countries is also a central focus of the current UNAIDS/WHO Workplan on circumcision. Thus there is broad consensus that data on safety and rates of complications will be of central concern in the international health community as MC is considered for promotion as an HIV/AIDS prevention intervention.

1.1 Circumcision in Sub-Saharan Africa

Approximately 62% of adult males in Africa are circumcised (Drain et al., submitted). Virtually all Muslim adult males are circumcised and there are a few minority Christian and animist groups that observe the practice (e.g., Nomiya Church). Most ethnic groups in west African countries practice circumcision, and most, but by no means all, of these observe circumcision in infancy and early childhood (Moses et al. 1990). In east and southern Africa there is a belt of mainly Bantu-speaking groups that do not traditionally practice MC, and these areas are those with the highest HIV prevalence (Bongaarts et al. 1989; Moses et al. 1990; Caldwell and Caldwell 1996; Halperin and Bailey 1999). Linguistic evidence suggests that all Bantu-speaking groups practiced MC as a rite of passage to manhood, but at various points over the last three hundred years the practice was dropped by some, mainly lacustrine, Bantu (Marck 1997).

In Kenya, almost all ethnic groups traditionally practice MC. Those that do not include some peoples spilling over the Ugandan border (e.g., Teso and Chapadola), and the Turkana and Luo (Dodge and Kaviti 1965, Bailey personal observation). The Turkana are a relatively small pastoral group in northern Kenya; the Luo are nilotic-speaking people numbering approximately 3.2 million, inhabiting Nyanza Province along the eastern shore of Lake Victoria. HIV prevalence in Nyanza is the highest of any area of Kenya (NASCO 2004, KDHS 2004). Kisumu is the provincial capital of Nyanza and one of the three sites where RCTs of MC are underway. Remarkably, Nyanza is adjacent to the Western Province, home of the Babukusu, subjects of the research reported here.

Among those who do practice MC, there is a great deal of cross-cultural and inter-individual variation in the techniques used, the instruments employed, and the amount of foreskin removed (e.g., see Brown et al. 2001). For many, circumcision is part of a prolonged ritual involving many others in the family and community, and the procedure is performed in public by a traditional surgeon who has no formal training. Under these conditions, the procedure is often painful – indeed it is an essential part of the ceremony that the boy experience pain in order to



become a man. For others, circumcision is done privately by a medical doctor in a clinical setting with minimal recognition by others and pain is minimized. Still others undergo the procedure in a clinic, but participate in all other ceremonial rites (Mayatula and Mavundla 1997). Since circumcision involves the permanent removal of living tissue, it is a procedure that, in any setting performed by any practitioner, involves some risk of temporary or permanent complication.

1.2 Complications Due to Circumcision

1.2.1 *Complications and traditional MC*

Accounts of serious complications or adverse events after adolescent and adult circumcision in traditional settings in Africa are legion. Every circumcision season there are articles in national and local newspapers depicting in words and pictures cases of advanced infection, severe loss of blood, mutilation, and even deaths due to events attributable to MC. In the scientific literature, there are reports listing adverse events from traditional

circumcision generated from hospital records (e.g., Mayatula and Mavundla 1997; Ahmed et al. 1999; Crowley and Masner 1990; Magoha 1999; Khalifa 2000), but without knowing the total number of males circumcised in that area (i.e., the denominator), it is not possible to estimate rates of adverse events. There is one study from Nigeria reporting that among 750 children circumcised, a relatively small number of cases with complications were reported, including 12 cases of excessive bleeding, six cases of infection, two cases of tetanus, and one death, leading to a complication rate of 2.8% (Myers et al. 1985). This is comparable to rates in medical clinics, but the complications in clinical settings tend to be less severe. In interviews with clinicians who have practiced in Uganda, Kenya, Tanzania, Zimbabwe, Malawi, and South Africa, every person interviewed had at least one personal experience with a case of a youth coming to hospital with advanced infection, hemorrhage, lacerations, meatal ulcers and stenosis, necrosis, and even amputation. Such reports are widely publicized; yet, other than the study from Nigeria of

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1.2.2 *Complications and medical MC*

MC is a relatively simple and safe procedure when performed in a clinical setting under antiseptic conditions by trained professionals (Kapila and Williams 1993). As increasing numbers of medical clinics are opening across sub-Saharan Africa for circumcision purposes, they are sometimes staffed by individuals with little or no medical training (Caldwell and Caldwell 1996) and may have inadequate instruments or supplies (Mattson et al. 2004).

The incidence of complications after clinical circumcision is unknown because they are overlooked or underreported. Most data on complications comes from infant circumcision in developed countries, where reports of two large series suggest that the complication rate is between 0.2% and 0.6%. Bleeding is the most frequent complication and is seen in less than 0.1% of infant circumcisions. Infection is the second most common complication, but these cases are often very minor and generally result in local redness or inflammation. Wound separation, unsatisfactory cosmesis, skin bridges, urinary retention, meatitis, and meatal stenosis occur less frequently, and in very rare instances, urethral fistula, amputation of a portion of the glans, gangrene, meningitis and penile necrosis are known to occur (Kaplan 1983).

Very little data from adolescents or adults are available from African clinical settings. One study from Tanzania found that in infant circumcision using the Plastibell, the rate of complications requiring a follow-up visit to the health facility was 2% (Manji 2000). We recently reported that the rate of adverse events during 479 operations performed during our RCT of MC in Kisumu, Kenya, was 3.5% (Krieger et al., 2005). Since then, the rate of complications among approximately 1450 procedures has declined to 1.7%. None of the adverse events were severe; most were mild and consisted of infection and bleeding due to wound disruption. All were resolved within days. In such a clinical trial setting, with ample resources, careful training and multiple levels of oversight, we would expect rates of complications to be low. In less regulated and more conventional African health facility settings, adverse events may occur at higher rates and may have more severe sequelae.

Increasing numbers of young men and parents are already seeking affordable circumcision services, some turning to traditional circumcisers and unqualified practitioners. We must have the information necessary to assess existing services, to identify resource and training needs for improving circumcision services, and to learn the points at which interventions to improve services are most likely to be effective.

The beneficial effects of MC under different conditions (e.g., varying HIV prevalence, varying population pyramid, varying sexual risk behaviors, and varying ulcerative STDs) must be weighed against the risk of complication from the circumcision procedure. If the incidence of adverse events is high, the protective affect of MC in the population could be mitigated by high rates of morbidity and mortality due to the procedure. Add to this the costs of training, provision of proper instruments, payment of providers for the procedure, and the benefits of MC may be outweighed by the risks of morbidity and the diversion of resources from other prevention and treatment programs. This is a significant concern that arises as the international health community debates promotion of MC services. Meanwhile, increasing numbers of young men and parents are already seeking affordable circumcision services, some turning to traditional circumcisers and unqualified practitioners. We must have the information necessary to assess existing services, to identify resource and training needs for improving circumcision services, and to learn the points at which interventions to improve services are most likely to be effective.

2.0 OBJECTIVES

The aims of this study were to assess variation and safety in MC practices, as well as resource and training needs related to MC, in a community that has been practicing circumcision traditionally for many generations. While traditional circumcision is the norm in the study community, many parents and young men are turning to “medical” circumcision. This provided the opportunity to collect data on both traditional and medical circumcision practices and outcomes. Specifically, the objectives of this study were:

- To describe current MC practices in clinical and traditional settings.
- To assess quality of existing services, especially determining rates, types, severity, and causes of adverse events.
- To assess the operational requirements of providing safe MC services.

3.0 STUDY POPULATION

3.1 Babukusu in Western Kenya

The Babukusu are one of the eighteen sub-nations that constitute one of Kenya’s three largest ethnic groups, the Abaluyia (or Luhyia), a Bantu-speaking group of western Kenya. The Babukusu comprise more than two hundred clans, which share common backgrounds and customs, including male circumcision, strongly kin-based social networks governed traditionally by their lineage and clan elders (Osogo 1966). The Babukusu are the largest ethnic unit of the Baluyia nation, comprising 17% of the Baluyia population or about 600,000 people (Wandibba 1977). Today they inhabit primarily the Bungoma District of Western Province. Their neighbors are the Luo to the south and southwest, and to the north and east are the Kalenjin. To the west near and across the Ugandan border live the Samia, Phadola, Bagwere, Teso and Bagisu, some of whom (e.g., Teso and Basoga) do not practice circumcision. Lubukusu, the language of the Babukusu, and other cultural traits, including circumcision practices, are closely related to those of the Bagisu of Uganda (deWolf 1977). The Babukusu have an agricultural economy, their main crops being maize, beans, sugarcane, coffee and tea. They also keep cattle, sheep and goats. Recently, many Babukusu have migrated to urban areas in search of work. There is a sizable Bukusu community in Nairobi, for example (Weissner 1997).

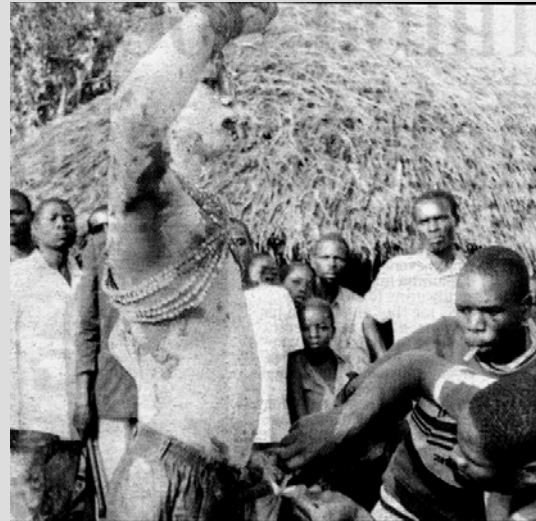
Male circumcision is virtually universal among the Babukusu. Most young men are circumcised by a traditional surgeon, but increasingly families are turning to western-style medical practitioners for the procedure. As a backdrop for this study, we provide information about the ideal Bukusu model of male circumcision practices and functions, and we discuss how that model has been in the process of being reshaped as the Babukusu struggle with forces of westernization, a more global market economy and a school-based educational framework.

3.2 The Bukusu Traditional Model of Circumcision

The traditional circumcision model comes from descriptions garnered from ethnographies and other published accounts of the Babukusu and neighboring Abaluyia (Adamson 1967; Osogo

1966; Sangree 1997), from accounts of circumcision ceremonies by the Bagisu in Uganda, who are linguistically and culturally very similar to the Babukusu (Othieno and Neema 1995) and from accounts by Bukusu informants interviewed during our study. Not all accounts are consistent, and considerable variation across clans and families and individuals has been evident for generations, but a general model emerges.

Circumcision is the initiation of a boy into the rights and responsibilities of manhood. It takes place every other year after the main harvest in boys who are organized into age sets of 12 to 20 years old. No man should marry until he has been circumcised and it is considered an embarrassment, if not taboo, to wed before being circumcised. It is a symbol of courage and represents a boy's respect for his family and community, bringing his relatives honor. In addition, circumcision is a cultural marker, which distinguishes Babukusu as a people from their non-circumcising neighbors such as the Luo to the south, and the Ateso and others to the west. It is one of several identifying features that exclude, or at least separate, Luo men from Bukusu social intercourse.



Courtesy of Ron Gray

Traditional circumcision in Uganda

Prior to the circumcision, initiates were traditionally secluded for up to six months. At one point during their sequestering, the young males are spiritually “put to death and reborn” in the circumcision grove by the ritual circumcision chief. Only those already initiated or awaiting circumcision may enter the sacred grove. When the family determines that it is a boy's year to be circumcised, the boy must visit his mother's brother to inform the uncle that this will be his year to become a man. If the uncle agrees, he must provide a bull to be slaughtered, and other relatives should help to prepare food and brew for the circumcision day. The day prior to the ceremony, the boy arrives at the uncle's residence for slaughtering of the bull. The boy then must carry a large portion of the meat on his head back to his father's compound. Early the next morning before sunrise, the boy and his male relatives go to a stream and, as the boy bathes in the cold water, ritual songs are sung. When they return to the compound, the boy is circumcised in front of his many relatives by an elder and his assistant, who is likely later to become a circumciser himself. The initiate must stand rigid without moving, and if his feet move or his facial expression changes, his family is disgraced. If he is especially brave, he jumps up and down after the cut, blood splashing over the observers. The initiate sometimes holds a small rooted tree above his head which is to give him strength throughout the procedure. The circumciser's assistant sprinkles dried and pounded clay on the initiate's penis to prevent the prepuce from sliding forward again. To prevent the wound from becoming septic a fiber ring is wrapped around the penis until it heals and the boy carries medicine with him in a roll of leaves to care for his wounds. All of these items are eventually burnt. A cohort of initiates is secluded for three months together in a hut. If they leave, they are required to hide themselves under a grass hood, which belongs to members of the previous circumcision cycle. Girls are not

supposed to come within sight of them. When the seclusion period is over, the initiates bathe in a river and are told how to behave as men, what their responsibilities are as protectors of the village, as owners of cattle, as husbands of women, and as fathers of children. They are presented with a shield and spear and told to be warriors and guardians of the village. They are then eligible as men to build a separate hut in their father's compound, to have their own shamba (garden), to have rights to land, to herd their own cattle, and to acquire their first wife.

3.3 Changing Practices

Increasing the HIV/AIDS epidemic has forced Babukusu, as others, to reevaluate all their behaviors and practices, and to bring those things that used to be considered mainly in the contexts of culture, tradition and religion into the contexts of health, prevention of infection, education, and survival.

Various forces of change are exerting pressure on Bukusu families to adapt male circumcision rites and practices in ways that are congruent with the changing demands on their time, resources and social ecology. Population pressure on the land and other factors (deWolf 1977) have forced a shift away from agro-pastoralism to more purely agricultural or salaried and day labor subsistence. The need for jobs has resulted in greater emphasis on schooling and in changing residence between natal rural villages and cities and large towns like Bungoma and Nairobi (Weisner 1997), and

these in turn have put more pressure on attaining sufficient resources to pay school fees and rents (Ogotu 1985). Emphasis on wage labor in the face of limited jobs has changed gender roles (Bradley 1977; Nasimiyu 1985) as well as intergenerational roles (Killbride and Killbride 1997). Throughout, respect for family tradition, clan identity, and one's elders has eroded (Wandibba 1997). Finally, the HIV/AIDS epidemic has forced Babukusu, as others, to reevaluate all their behaviors and practices, and to bring those things that used to be considered mainly in the contexts of culture, tradition and religion into the contexts of health, prevention of infection, education, and survival.

These factors have changed the circumcision practices. Boys are no longer sequestered for months at a time. The circumcision season is scheduled around the school calendar. Circumcisions take place in late July and early August, as boys finish school. This is to allow time to heal before resuming school in September. The "coming out" ceremony then occurs in December, during the Christmas school holiday. Instead of a spear and shield, boys are given a new change of school clothing or schoolbooks and pens. Celebrations in many cases are not as elaborate (and costly) as in the past, since families care to save their money for school fees. And more and more Bukusu families are turning to medical circumcision to fulfill their cultural obligation to be circumcised. The main reasons are those of cost (traditional circumcision is more expensive because of the need to kill a bull and the feasting and celebrations that are sponsored by the family), need for rapid healing to return to school, fear of injury, desire to be "modern," alternate ways to express manhood (graduation from school, getting a job, earning income), and reduced risk of infection, including HIV infection.

In summary, numerous factors are contributing to changes in the preferences of Babukusu for different circumcision practices. Many are continuing some form of traditional practice with the procedure performed by a traditional surgeon in the context of traditional rituals and ceremonies. Others are turning to medical clinics and having private operations performed with little or no knowledge of extended family and community members, while others may be pursuing a middle ground – having medical clinicians perform the operation, but otherwise engaging in traditional pre and post circumcision ceremonies. Just what proportion of Bukusu youth are being circumcised in clinics is unknown, but it is certainly in the hundreds each circumcision season and increasing. One church organization performed approximately 1000 procedures near Kitale in 2004. At one health center in 2000, 120 circumcisions were performed. In the Bungoma District Hospital, the District Medical Officer told us “more than hundred” were performed, and they handled six cases of young men who were circumcised by traditional surgeons and came to the hospital with serious complications, one of which resulted in amputation.

4.0 METHODS

The research took place in three primary phases: During Phase One, local and national approval, including IRB approvals for the study were obtained, staff were identified and hired, a sample of 1100 young men to be circumcised in August-September, 2004 were identified, traditional and clinical circumcisers were contacted and interviewed, and focus group discussions with parents and young men about Bukusu circumcision practices were conducted to assist with later close-ended interviews. During Phase Two, 24 traditional and clinical circumcisions were observed directly; men identified in Phase One were traced and 1010 were interviewed after circumcision to determine complication rates and levels of satisfaction with the procedure; charges for the procedures were determined, and instruments and supplies available for the procedure were assessed in a sample of health facilities. During Phase Three data were analyzed and this report was prepared.

4.1 Focused Group Discussions

Focused group discussions (FGD) were performed with male and female Bukusu adults to obtain background information on variation in circumcision practices and beliefs and attitudes about circumcision done traditionally and in medical settings. The primary purposes of the FGD were: First, to explore how Babukusu talk about and view male circumcision. This includes how they categorize different circumcision practices, how they categorize and view traditional and clinical practitioners, and how they view the risks and benefits of various circumcision techniques done by various types of practitioners. Second, to determine the range of factors Babukusu of different ages take into account when considering different circumcision options for their sons and for themselves. And last, to develop a list of complications known or believed to occur as a result of the circumcision procedure. The qualitative information collected during the FGDs provided background information essential to developing more targeted lines of inquiry during participant observations and interviews. More importantly, the information from the FGDs was used to develop more closed-ended questions during interviews with boys and young men.

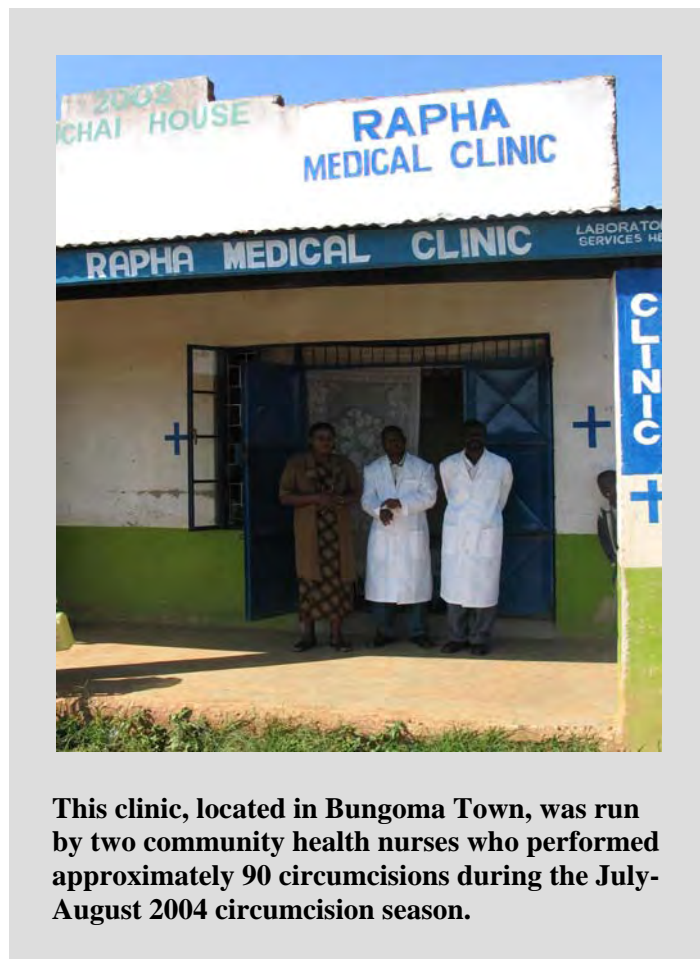
Twenty-one FGDs were conducted – 14 in rural areas and 7 in Bungoma, the Bungoma District capital city of 80,000 residents. Ten FGDs were with females and 11 with males. Groups were

divided into the following approximate age categories: 50+ years, 25-45 years, and 15-21 years. The last group consisted of recently circumcised young men. Participants were a convenience sample recruited at markets and other public places and in villages through village leaders. Each FGD consisted of 7-12 consenting Bukusu participants. A FGD script was developed with two Bukusu male and two Bukusu female research assistants. The script covered the following topics: different methods of circumcision; different kinds of circumcisers; reasons for choosing traditional and clinical circumcision; complications from circumcision; perceptions about the frequency of complications by different practitioners. Specific probes were included to elicit responses concerning specific factors we hypothesized, based on our knowledge and previous research, to be significant in the circumcision decision (e.g., cost, pain, infection, sexual pleasure, manhood, etc). The focus group scripts were translated from English to LuLuyia independently by the research assistants and any discrepancies discussed and rectified. The FGDs were tape-recorded with the participants permission. The tapes were translated and transcribed within three weeks of each session into Microsoft WORD and have been downloaded into NUDIST.

The analyses and specific results of the FGD will not be presented here, except to the extent that they provide background information for the rest of the study or inform other aspects of the results. The transcripts from the FGD have been analyzed by Omar Egesah and will form part of his dissertation for the PhD in Anthropology from Moi University.

4.2 Interviews with Circumcisers

Forty-one circumcisers – 21 traditional and 20 clinical – were interviewed to obtain information about: the methods and instruments they use, training and experience, the amount they charge for the procedure, the numbers performed during the previous circumcision season, reported number and types of adverse events, and what measures are taken to reduce complications. Those interviewed were a convenience sample of men who had performed circumcisions during the August, 2004 circumcision season. Clinicians were identified and contacted through government health facilities, church-run clinics, and private clinics. They included Medical Officers, Clinical Officers, male nurses, a laboratory technician. Traditional circumcisers were identified by village leaders and by young men who underwent



This clinic, located in Bungoma Town, was run by two community health nurses who performed approximately 90 circumcisions during the July-August 2004 circumcision season.

circumcision. All the providers approached consented to be interviewed. Interviews lasted approximately one hour and were conducted in Luluyia, Kiswahili or English, depending on the preference of the circumciser.

4.3 Observations of Circumcisions and Post-surgical Follow-up

Twenty-four circumcision procedures (12 traditional and 12 medical) were directly observed by the Clinical Officer and one Research Assistant (RA). The boys to be observed were selected during the initial contact interview by convenience by the RA on the basis of his familiarity with the area or the family of the boy and the willingness of the boy and his parents to be observed. The RA was notified of the time and place the procedure was to take place. He and the Clinical Officer then went to the clinic or the village and observed the ceremony and procedure, noting the methods used, the amount of bleeding and apparent pain involved, the instruments used, the suturing technique, if applicable, the bandaging used, and the condition of the subject. Each subject was then visited approximately 3, 8 and 30 days post-procedure. Among those subjects whom we observed to have a complication, we decided to add a visit at approximately 90 days post-op to observe the final outcome. In a few cases in which we were concerned about the progress of the wound, we visited the subject at approximately 12 days post-op. At each visit the following was noted by the Clinical Officer: general level of healing, presence of infection; degree of swelling; level of pain, erection history, level of satisfaction with the procedure, visits to a health provider, sexual activity, and medication history. Adverse events (AEs) were noted using the same protocol as used in the RCT of MC in Kisumu.

4.4 Interviews with Boys/Young Men after Circumcision

The 1103 boys and young men who were contacted in Phase 1 were followed up in late August through October, after the circumcision season. Of the 1103 originally identified, all but four were re-contacted. Of these 1007 underwent circumcision in either a traditional or medical setting. All 1007 were interviewed. The interview lasted a mean of 14 minutes (range 7 – 95) and consisted of questions regarding demographics; type and experience of circumcision; sexual history before and after circumcision; reported complications; erection history; who made the decision regarding circumcision; satisfaction with the experience, including whether they would change anything; and knowledge of any peers who had experienced complications.

4.5 Inventories of Circumcision Instruments and Supplies in Health Facilities

Inventories of three hospitals, one Health Centre and 14 private clinics were taken to assess the presence and condition of the instruments and supplies necessary for performing safe circumcisions. The in-charge at each facility was asked to show each of the instruments on a checklist provided to the Research Assistant. Only those instruments considered to be in working order were included in the inventories. Twenty traditional circumcisers were also asked to show the instruments and supplies they had on hand to perform circumcisions. They were identified by parents and boys who underwent circumcision.

5.0 RESULTS

5.1 Direct Observations and Follow-up of 24 Circumcisions

Twenty-four circumcisions – 12 medical and 12 traditional – were observed directly. Mean age of boys circumcised medically was 13.6 years; those done traditionally were slightly older averaging 14.6 years. The outcomes of the 12 medical and 12 traditional circumcisions are summarized in Table 1. Using the same criteria for recording adverse events (AEs) as used in the RCT of MC in Kisumu, Kenya, we found that only one of twelve medical procedures and two of twelve traditional procedures resulted in no AE. The AEs recorded ranged in severity from mild (e.g., mild infection or wound disruption) to very serious or life-threatening. Surprisingly, medical circumcisions did not result in appreciably fewer AEs than traditional ones, and the severity of the AEs was about the same for both methods.

Using the same criteria for recording adverse events (AEs) as used in the RCT of MC in Kisumu, Kenya, we found that only one of twelve medical procedures and two of twelve traditional procedures resulted in no AE.



Example of a medical circumcision 18 days post-surgery. The sutures have broken, there is a low grade infection, and the wound edge is jagged. This 12 year-old required 3 courses of antibiotics before the wound was fully healed, with poor cosmetic outcome, approximately 60 days post-surgery.

In two cases, medical circumcisions were done under general anesthesia. These were both cases of young boys, ages 8 and 10 years, who were very frightened and unable to remain still. In both cases, the boys did not want to be circumcised, but were coerced by their parents. The concept of informed consent was unknown to both the parents and the practitioners in these cases. Local anesthesia was used in the remaining 10 cases of medical circumcision, but no anesthesia was used in any of the traditional procedures.

Broken sutures and infection requiring antibiotics were the most common AEs in the medical circumcision cases. Broken sutures were caused by use of the improper gauge suture material – usually 1/0 or 2/0 gut instead of the recommended 3/0 and 4/0. Use of the wrong suture material resulted in widely spaced stitching and ballooning around the sutures. Sometimes little or no inner foreskin was left, so there was inadequate tissue for the sutures to gain purchase. These conditions often resulted in sutures breaking, a jagged cut

line, infection requiring antibiotics, and delayed healing.

In no case, whether medically or traditionally circumcised, was a subject found to be fully healed by 30 days post-op. This is in contrast to our RCT of MC in Kisumu in which all of approximately 1450 subjects were fully healed at 30 days (Krieger et al., 2005). In medical circumcisions, delayed healing was a result of not only broken sutures and infection, but also too much skin being removed (more than 3 cm from the coronal sulcus to the cut line) and incomplete circumcisions that required recircumcision. In traditional circumcisions, the most common cause of delayed healing was very deep and extensive cutting which made it difficult for blood supply to cross from the cut line to the coronal sulcus. Gross edema, especially around the frenulum, was observed in most of the traditional circumcisions. The problem of incomplete circumcision requiring recircumcision was more common in traditional circumcisions than in medical ones. Because the traditional circumciser often performs the procedure hastily to limit the pain endured by the initiate and possibly to demonstrate his prowess, a large amount of foreskin may be left behind, or a flap of tissue may be remaining. For cosmetic, if not for health reasons, the boy and his family often desire this excess tissue to be removed. This requires recircumcision days or weeks after the original procedure. It often results in excessive skin being removed, extending the cut line and deepening the original wound, slowing the healing process and increasing chances of

In no case, whether medically or traditionally circumcised, was a subject found to be fully healed by 30 days post-op. This is in contrast to our RCT of MC in Kisumu in which all of approximately 1450 subjects were fully healed at 30 days (Krieger et al., 2005)

infection, excessive scarring, and loss of penile sensitivity. In three cases, the subjects (ages 15, 15 and 17 years, respectively) may have lost erectile function, since they had not had an erection by 90 days post-surgery.



A case of a 16 year-old who was originally circumcised by an unqualified “medical” practitioner and later by a traditional practitioner. Had the research team not taken him to hospital, this young man would likely have died.

The one very serious, life-threatening case was of a 16 year-old who was first circumcised by a “medical” practitioner who actually had no documented medical qualifications (he was a cleaner at a hospital in a neighboring district), but had set up a clinic in the area. Upon circumcision, the bleeding was so profuse, that the young man was transferred to a nearby health centre where the bleeding was arrested and he was put on

intravenous (IV) fluids. The Clinical Officer in-charge decided that the circumcision was incomplete. Not being qualified himself to perform the procedure, he called in a traditional circumciser who proceeded to circumcise the young men. When the research team visited the young man three days after the procedure, he was still in the health centre; the wound was infected and unhygienic. The team cleaned up the wound and provided bandaging and antibiotics. They did this again eight days post-surgery when the subject was visited in his home. When the team revisited the young man 14 days after the procedure, the wound had become necrotic, there was evidence of gangrene, and the young man was anemic and in severe pain. The team decided to take the subject to the district hospital, where he was admitted and retained for 5 days. Under general anesthesia, the wound was re-explored, the cut cleaned and resutured, ample supply of bandaging was provided, and food and new clothing were provided. When the subject was visited at home 30 and 37 days after the original procedure, he was found to be progressing well, and at 56 days post procedure the wound was fully healed, the subject had gained weight, and he had resumed most normal activities. The team believes that the subject would likely have died had there not been an immediate intervention.

Table 1. Adverse events directly observed from 12 medical and 12 traditional circumcisions performed in Bungoma District, Kenya, July-August, 2004.

DESCRIPTION OF EVENT	MEDICAL N=12		TRADITIONAL N=12	
	#	%	#	%
Use of general anaesthesia	2	17	0	0
Use of local anaesthesia	10	83	0	0
Sutures used	9	75	0	0
Sutures widely spaced with edema	5	56	n/a	n/a
Sutures broken	5	56	n/a	n/a
Infection requiring antibiotics	6	50	5	42
Wound not healed at 30 days	12	100	12	100
Torsion	2	17	0	0
Profuse bleeding requiring IV fluids	1	8	0	0
Incomplete foreskin removed	2	17	5	42
Required recircumcision	2	17	4	33
Wound >3cm corona to cut line	3	25	4	33
Jagged cut line/skin not uniform	2	17	3	25
Haematoma requiring surgery	1	8	0	0
No sensitivity corona to cut line	4	33	3	25
Loss of erectile function at 3 mos	0	0	3	25
Required hospitalization	1	8	0	0
Permanent adverse sequelae	3	25	4	33
No adverse event	1	8	2	8

The level of AEs in this small sample of 12 medical and 12 traditional circumcisions was alarming. All but three cases (88%) had some AE associated with them, and seven of the 24 cases (29%) resulted in what we judged to be permanent adverse sequelae. In the medical cases these were mostly cosmetic - two cases of pronounced torsion and one case of jagged cut line with a mass of foreskin remaining. In the traditional cases, the sequelae were more serious, with three cases of erectile dysfunction and one case of persistent swelling and extensive scarring.

5.2 Results of Interviews with 1007 Men Post-Circumcision

Of the 1103 boys and men contacted in April-June, 2004, 1099 were recontacted during or after the circumcision season, in July-August, 2004. Of these, 1007 underwent circumcision in July-August, 2004. All 1007 were interviewed by the five research assistants. The mean time of the interview was 14 minutes with a range of 7 to 95 minutes. There was no difference in the length of the interview by circumcision type (traditional versus medical).

Table 2. Characteristics of 1007 young men interviewed post-circumcision by type of circumcision.

	TRADITIONAL N = 445	MEDICAL N = 562	P VALUE
Age			
mean	14.7	13.2	0.001
median	15.0	13.0	
range	5 - 20	5 - 21	
Years of school			
mean	5.6	5.4	0.510
range	0 - 9	0 - 12	
Residence (%)			
urban	12.8	23.5	0.001
rural	87.2	76.5	
Days since Circumcision			
Mean	47.5	47.7	0.870
Range			
Religion (%)			
Catholic	55.6	44.4	0.01
Protestant	36.9	63.1	
Muslim	0.9	1.8	
None	1.6	0.7	

Table 2 provides a summary of the characteristics of the sample by circumcision type. Those who were circumcised traditionally were significantly older (14.7 vs 13.2 years) and were more likely to reside in a rural area (87.2% vs 76.5%), although the entire sample was predominantly rural (81.2%). There was no difference in the number of days between when the subjects were interviewed and their day of circumcision. The median number of days between circumcision and the interview was 46 for both groups, with a range of 35 to 96 days. Those circumcised

traditionally were more likely to be Catholic, while those circumcised medically were more likely to be Protestant. This difference is probably a result of a nearby Anglican Church providing a free circumcision clinic, where 88 subjects in our sample underwent the procedure medically.

The age distribution of subjects circumcised by each type is shown in Figure 1 below. From this we can see that those circumcised traditionally undergo the procedure at an older age than those circumcised medically. From our interviews with parents and the young men, we detected a bias for older age at circumcision in traditional settings because of concern for the ability of the boy to withstand pain and to endure the complications that can ensue from traditional circumcision. Because parents anticipated fewer problems with medical circumcision, they were willing to have their sons undergo the procedure earlier than if done traditionally. Also, many who had their sons circumcised traditionally wished to delay the procedure until they had accumulated enough funds to pay for the procedure and all the festivities and obligations that surround it.

Figure 1. Age by Circumcision Type

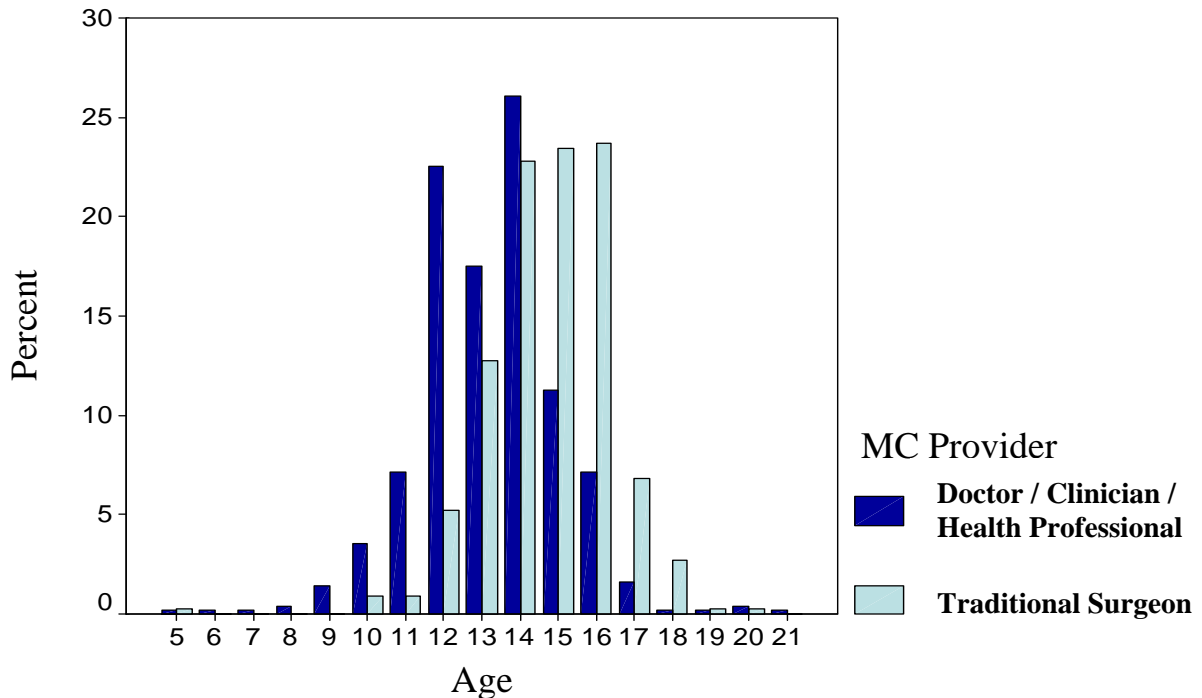


Table 3 below shows the differences between those circumcised traditionally versus medically. As seen previously, those circumcised traditionally are more likely to be older and more rural, but there is no difference in education level between the two groups. Most relevant is that those circumcised traditionally were 2.53 times more likely to report an adverse event than those circumcised medically. The reported AE rate among those done traditionally was a shocking 35.2%. The AE rate among medical circumcisions was significantly lower (17.7%), but nevertheless very high compared to rates observed in developed countries and in clinical settings in Nigeria and Kenya (Magoha, 1999).

Table 3. Differences between 1007 males circumcised traditionally versus medically in Bungoma District, Kenya.

	TRADITIONAL		MEDICAL		OR	95% CI	P-VALUE
	#	%	#	%			
Age							
15 and Younger	291	66.3	506	90.4	4.77	3.38, 6.72	<.001
16 and Older	148	33.7	54	9.6			
Rural/Urban							
Rural	388	87.2	430	76.5	0.48	0.34, 0.67	<.001
Urban	57	12.8	132	23.5			
School Group							
Primary	442	99.3	554	98.9	0.63	0.16, 2.52	.510
Secondary	3	.7	6	1.1			
Complications							
Yes	156	35.2	99	17.7	2.53	1.89, 3.38	<.001
No	287	64.8	460	82.3			
Fully healed							
Yes	299	75.9	397	81.2	0.73	0.53, 1.01	.056
No	95	24.1	92	18.8			
Sought care at hospital							
Yes	59	23.1	83	31.1	0.67	0.45, 0.99	.042
No	196	76.9	184	68.9			
Pain with erection							
Yes	90	20.9	103	19.3	1.10	0.80, 1.51	.548
No	341	79.1	430	80.7			
Sex before circumcision							
Yes	280	63.1	199	35.5	3.11	2.40, 4.02	.001
No	164	36.9	362	64.5			
Sex since circumcision							
Yes	28	6.3	17	3.0	2.16	1.17, 4.00	.014
No	413	93.7	542	97.0			
Would choose different method							
Yes	70	15.9	80	14.4	1.13	0.79, 1.59	.507
No	371	84.1	477	85.6			

We asked the subjects to characterize the adverse events that they experienced. The most common complications reported were excessive bleeding, infections and excessive pain, with bleeding the most common. Other common AEs reported were pain upon urination, incomplete circumcision requiring recircumcision, and lacerations of the glans, the scrotum and the thighs. Many boys who were circumcised traditionally reported that they were unable to stop the bleeding after the procedure, and their parent either took them to hospital, or, more frequently, called a health professional or “traveling nurse” to come to the compound to arrest the bleeding and provide bandaging. Infections were equally common among subjects circumcised medically and traditionally, although those circumcised medically were about 50% more likely to go to a

health facility for post-operative care (OR=0.67; 95%CI, 0.45-0.99). Those circumcised traditionally were more likely to report receiving antibiotics from local practitioners, some of whom are qualified Clinical Officers or nurses, but many of whom are “traveling nurses” with few or no qualifications. These informal practitioners often sold injections to address infections and bandaged the wound after applying gravacine (a powder with penicillin and talc). We encountered this substance in over half the 24 cases that we observed directly (see 5.1 above).

Whether it prevented infections we cannot be sure, but it tended to cake in the wound, delay healing, and result in thick scarring and permanent discoloration.

As mentioned previously, the average time between circumcision and the interview was the same for each group – a mean of 47 days. In 24% of the traditional cases and 19% of the medical cases, the wound had still not healed at the time of the interview. This was borderline significantly different ($p=0.056$), and is in sharp contrast to our RCT of MC in Kisumu, Kenya, in which all the subjects are fully healed by their 30 day post-op visit. Since many of these young men are sexually active (see below), such a long period for healing could expose them to elevated risk for HIV infection through an open wound. For example, 4.5% of the young men had already engaged in sex since their procedure – twice as many of those circumcised traditionally (6.3%) than those circumcised medically (3.0%) (OR=2.16; 1.17, 4.00).

Most relevant is that those circumcised traditionally were 2.53 times more likely to report an adverse event than those circumcised medically. The reported AE rate among those done traditionally was a shocking 35.2%. The AE rate among medical circumcisions was significantly lower (17.7%), but nevertheless very high.



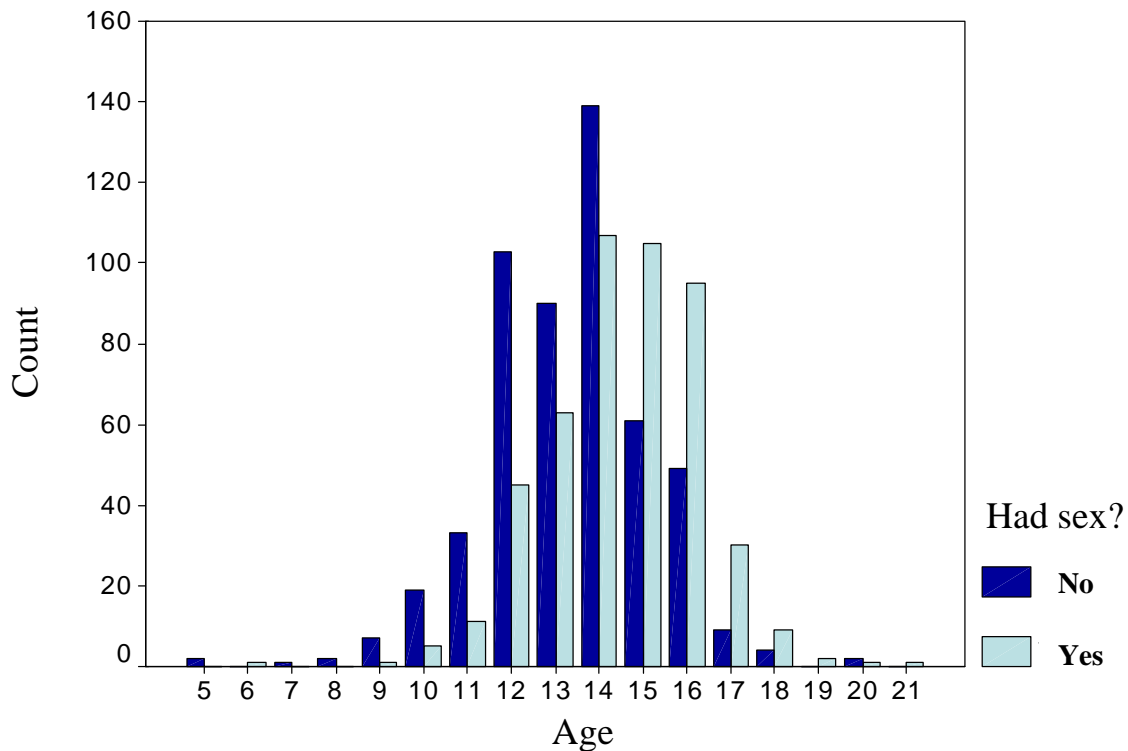
A case of haematoma in a 13 year-old 12 days post-circumcision. This young man was circumcised by a Medical Officer in a private clinic. The wound was later drained and re-sutured by the project Clinical Officer.

Table 3 shows that overall, 47.7% of the young men were sexually active before undergoing circumcision. Among those circumcised traditionally 63.1% had experienced their sexual debut before circumcision, and 35.5% of those circumcised medically had sex prior to the procedure. Males circumcised traditionally were over three times more likely to have engaged in sex before they were circumcised. After adjusting for age at circumcision, the odds of having had sex before circumcision were 2.38 times greater (95%CI 1.15, 4.93) for those circumcised traditionally than those circumcised medically. The distribution of those who have engaged in sex before circumcision by age at

circumcision (see Figure 2 below) further illustrates that many young men are having sex before undergoing the procedure, and indicates that sexual debut in this sample of young men is early - at age 14-15 years – and earlier in those circumcised traditionally than those circumcised medically. These findings have several implications for HIV/STI prevention interventions: First, sex education and prevention counseling should occur early in this population – before the young men are circumcised; and second, the events leading up to circumcision provide an opportunity to counsel young men who have just begun or are just about to begin their sexual careers.

During the interview, we asked the young men whether, if they had it to do over again, would they choose to be circumcised traditionally or medically? The results, shown in Table 3, were similar for each of the circumcision types. Of those circumcised traditionally, 15.9% said that they would be circumcised by a medical practitioner if they were to have the choice, and of those circumcised medically, 14.4% said that they would prefer to be circumcised by a traditional practitioner. The difference in proportions that would “cross-over” were not significant ($p=0.507$).

Figure 2. Age by Sex before Circumcision



To see if subjects, after undergoing circumcision themselves, were convinced of the value of the procedure, we asked them if they would circumcise their sons. Only four subjects who were circumcised traditionally and one who was circumcised medically said that they would not circumcise their son. The reasons given by all five were that they did not want their son to suffer the way they had suffered. That there are so few young men who would opt not to circumcise

their son indicates the extent to which male circumcision is viewed as obligatory in the Bukusu culture and suggests that this practice is unlikely to change for at least another generation.

In sum, the results from interviews conducted with young men one to three months after they have been circumcised strongly indicate that rates of adverse events are extremely high – 35% in traditional circumcisions and 18% in medical circumcisions. These rates are an order of magnitude greater than complication rates documented for developed country settings, although most of those data are from infant circumcisions. Traditional circumcisions in Bungoma result in rates of AEs twice those of medical circumcisions. Sexual debut occurs early - between ages 14 and 15 years – and about half the boys have had sex before they are circumcised. The circumcision wound heals slowly - about one in five cases had not fully healed by 47 days post-op – and some young men (6%) are starting sexual activity before the wound is fully healed.

5.3 Direct Observations and Interviews with 298 Males Circumcised Two Months Post-Circumcision

After conducting the interviews with approximately two-thirds of the subjects and after directly following the 24 cases described in section 5.1, it became apparent that AEs were occurring at very high rates. However, we did not know if the subjects were providing accurate reports of the AEs, nor could we assess whether the reported AEs resulted in permanent sequelae. We therefore decided to train the three male research assistants to do a brief clinical exam in conjunction with the interview with the remaining subjects. This resulted in interviews and direct observations of 298 consenting subjects, with no subjects declining participation. The results of the observations are shown in Table 4.

At 62 days post-op, there were still 16.8% of the subjects whose wounds had not fully healed, with those circumcised traditionally more than twice as likely not to have healed (OR=0.43; 95%CI 0.22, 0.84).

The median time from the day of circumcision to when the subjects were interviewed and observed was 62 days with a range of 45 – 96 days. There was no difference between the two groups in mean days since circumcision ($p = 0.420$).

The results of the direct observations were largely consistent with the reports by the subjects themselves once we consider that the observations were performed

approximately 15 days later than the interviews of the full sample of 1007 subjects. Although not statistically significant, those circumcised traditionally were nearly twice as likely to have crusts still present (11.6% versus 6.4%). Nearly 2% of the subjects had wounds were still open two months after the procedure. Fortunately, only one subject had any signs of infection, but 10% still had significant swelling - 13.9% of those circumcised traditionally compared to 4.8% or those circumcised medically. Thus those circumcised traditionally are more than three times as likely to have swelling (OR=3.20; 95%CI 1.27, 8.07).

The results of the observations further show that 11.6% of those circumcised traditionally had some foreskin remaining compared to just 2.4% of those circumcised medically (OR=5.32;

95%CI 1.54, 18.31). The remaining foreskin for those circumcised traditionally was more likely not to be uniform, but often consisted of jagged edges and flaps of foreskin covering part of the glans. In the three cases of medical circumcisions, the cut tended to be uniform and the prepuce reaching the sulcus, but not covering the glans. The amount of foreskin remaining is of great concern to the subjects themselves and their families. Because culturally the Babukusu are meant to be completely circumcised, the boys and their parents strongly prefer there to be no foreskin remaining. As we discovered in our observations of the 24 cases which we followed intensively (see Section 5.1 above), when boys have residual foreskin, they are very displeased, and parents may seek means of having the boy recircumcised. This often resulted in more extensive cutting (i.e., the wound extending further down the shaft of the penis) and a deeper wound. It is possible that some of the 20 young men who were incompletely circumcised by traditional practitioners were later recircumcised after completion of this study.

Table 4. Results of penile examinations of 298 males circumcised by traditional and medical practitioners in Bungoma District, Kenya, 45 – 96 days post circumcision.

	TRADITIONAL		MEDICAL		OR	95% CI	P-VALUE
	#	%	#	%			
Fully Healed							
Yes	136	78.6	112	89.6	0.43	0.22, 0.84	.014*
No	37	21.4	13	10.4			
Crust Present							
Yes	20	11.6	8	6.4	1.91	0.81, 4.49	.137
No	153	88.4	117	93.6			
Wound Still Open							
Yes	3	1.7	2	1.6	1.09	0.18, 6.59	.929
No	170	98.3	123	98.4			
Foreskin Remaining							
Yes	20	11.6	3	2.4	5.32	1.54, 18.31	.008*
No	153	88.4	122	97.6			
Signs of Infection							
Yes	0	100	1	.8	-	-	-
No	173	0	124	99.2			
Swelling							
Yes	24	13.9	6	4.8	3.20	1.27, 8.07	.014*
No	149	86.1	119	95.2			
Lacerations							
Yes	29	16.9	12	9.6	1.91	0.93, 3.91	.077
No	143	83.1	113	90.4			
Keloid Scarring							
Yes	30	17.4	12	9.6	1.99	0.98, 4.06	.059
No	142	82.6	113	90.4			

The subjects themselves and their parents are also often concerned about the extent and nature of scarring. We therefore noted the presence and absence of keloid scarring, and found that it was

twice as frequent in those circumcised traditionally (17.4% versus 9.6%; OR=1.99; 95%CI 0.98, 4.06). It is not clear what the cause of this difference is. Perhaps it is due to the deeper and more extensive wound that results from traditional circumcision. This could be something for consideration by urologists and surgeons involved in development of training programs for practitioners. The Research Assistants also noted detection of cuts or lacerations of the penis, scrotum and thighs of the subjects. These were more likely to be observed in those circumcised traditionally (OR=1.91; 95%CI 0.98, 4.06). Most of the cases of lacerations were not severe and they were all healed at the time of the observation. Many were on the penis itself and consisted of slight cuts of the glans and cuts extending down the shaft of the penis beyond the attachment of the foreskin. There were, however, also two cases of wounds on the scrotum, two on the thighs, and two on the pubic area. All but one of these was associated with traditional circumcision.

When boys have residual foreskin, they are very displeased, and parents may seek means of having the boy recircumcised. This often resulted in more extensive cutting (i.e., the wound extending further down the shaft of the penis) and a deeper wound.

The results of the direct observations conducted approximately two months after circumcision of 298 males were consistent with the reports from the subjects themselves. Those in the group who were traditionally circumcised were much more likely not to have healed, to have significant swelling, to have lacerations and keloid scarring, and to have a culturally unacceptable amount of foreskin remaining. Even among those circumcised medically, delayed healing, swellings and lacerations were prevalent compared to developed country settings.



Partially severed glans and deep, infected wound 13 days post-circumcision. The circumcision was performed on this 14 year-old in his village by a traditional practitioner.

5.4 Adverse Events by Practitioner and Facility

A summary of adverse events by the type of health facility is provided in Table 5. Among procedures done by medical practitioners in health facilities, those performed in public facilities resulted in half the rate of AEs compared to those in private facilities. Public facilities were mostly Kenya government-run hospitals and health centres, with two church-run facilities that were open to the public. These facilities were staffed by

Medical Officers and Clinical Officers, with most, but not all, procedures performed by Clinical Officers. Private facilities included a wide range of facilities, from private hospitals staffed by Medical Officers and Clinical Officers to storefront clinics and makeshift offices in private houses and huts run by Clinical Officers, nurses, and in some cases uncertified practitioners with no or little formal education in health care. For example, one “clinic” was established by a maintenance worker at a major hospital just for the circumcision season in a hut along a rural road. Another clinic was run by a Laboratory Technician.

Perhaps not surprisingly, the AE rates from procedures done in the private facilities were twice the rates in the public facilities, since circumcisions in public facilities were performed by practitioners with nursing or more advanced qualifications. Nevertheless, an AE rate of 11% in the public facilities is still high, and there is clearly room for improvement. An AE rate of 22.5% by private practitioners is unacceptable. Such a high prevalence of complications indicates that these practitioners require further training. Consideration should be given to a program of training, certification, periodic monitoring and continuing education.

Table 5. Proportion of procedures resulting in adverse events (AEs) by health facility and practitioner.

FACILITY TYPE	NUMBER	NUMBER AEs	%
Public Facility	111	11	11.1
Private Facility	246	78	22.5
Traditional	426	146	34.3
ACK Nzoia	81	4	4.9
Total	1002	255	25.4

Eighty-one of the males in our sample participated in a program run by the Anglican Church of Kenya (ACK) in nearby Nzoia. The church started a program of providing clinical circumcisions performed by Clinical Officers and trained nurses in mobile clinics that were established temporarily in villages around Nzoia. Their primary reason for providing this service was their concern about the cost of traditional circumcision. They saw families in

their parish being impoverished by the high costs of the ceremonies and rituals surrounding traditional circumcision and learned that many families wished to avoid these expenses. Reportedly, during the circumcision season (late July – early September), the ACK circumcised approximately 1000 boys and young men in the Nzoia area. While Nzoia was not within our

Those in the group who were traditionally circumcised were much more likely not to have healed, to have significant swelling, to have lacerations and keloid scarring, and to have a culturally unacceptable amount of foreskin remaining. Even among those circumcised medically, delayed healing, swellings and lacerations were prevalent compared to developed country settings.

Consideration should be given to a program of training, certification, periodic monitoring and continuing education.

study area, 81 of our subjects traveled to locations to take advantage of the ACK program. The males circumcised by the ACK reported significantly fewer AEs than those circumcised by other practitioners – just 4.9% compared to 11.1% at public facilities and 22.5% at private facilities. Other than talking with the director of this program, we did not investigate the methods used by ACK nor learn the details of how they run their program. We have learned that they have run out of funding and have discontinued the program, despite its apparent

popularity. The ACK program warrants further investigation, since it seems to have been successful in several respects: it seems to be providing a need in the community for inexpensive circumcision services that are relatively safe, and it is able to bring the services to the communities where otherwise many would likely be circumcised by traditional or unqualified “medical” practitioners.

5.5 Interviews with Practitioners

Twenty-one traditional and 20 medical practitioners were interviewed to assess their experience with the procedure, their levels of training, their experience with dealing with complications, and the amount they charge for the procedure. Results of the 41 interviews are shown in Table 6. Not surprisingly, the level of education of the medical practitioners was higher than that of the traditional circumcisers (15.4 years versus 6.8 years). The traditional circumcisers had performed more circumcisions over the last two years than medical circumcisers. None of the traditional circumcisers (versus three of the medical circumcisers) had performed fewer than 10 circumcisions, while 9 (versus 5) had performed more than 100.

With traditional circumcision, the charges for the procedure itself and any ensuing treatment, are most often a small part of the total cost to the family. As a traditional rite of passage, circumcision is not just a surgical procedure, but an event that entails weeks or months of preparation and involvement of the extended family, with costly celebrations and rituals. The total cost to the family varies tremendously, but may reach into the tens of thousands of shillings.

Among the medical practitioners, 11 worked in a private facility, and eight were employed in a public facility. When asked “what is the primary reason males should be circumcised,” 15 traditional circumcisers cited culture to be most important and five cited health, compared to medical practitioners who were more likely to cite health as most important – 17 responded that health was most important, and only two cited culture.

When the practitioners were asked if they felt that they were adequately trained to perform circumcisions, only one – a medical practitioner working as a nurse in a government health –

responded “no.” Nevertheless, when we asked if they would like further training, about half in each group felt that they could profit from additional training. Several traditional circumcisers in particular stated that they would like more information on penile anatomy, with attention to where nerves and arteries are located, and they desired training on how to best arrest bleeding.

Table 6. Results of interviews with 21 traditional and 20 medical practitioners in Bungoma District, Kenya.

	TRADITIONAL N=21	MEDICAL N=20
Mean years of school	6.8	15.4
# Circumcisions last 2 yrs		
1 – 10	0	3
11 – 25	4	4
26 – 100	8	8
100#	9	5
Facility type		
Private facility	n/a	11
Public facility	n/a	8
Reasons for circumcision		
Religion	1	1
Culture	15	2
Health	5	17
Are you adequately trained?		
Yes	21	19
No	0	1
Would you like more training?		
Yes	12	9
No	9	11
Average charge for circumcisin in Kenyan Shillings (70KS/\$1US)	345 (100-500)	564 (350-2000)
Additional charges	Chicken, sheep, food, 50 shillings, dressing	Antibiotics, dressing, tetanus shot, added visits
Have had clients come to them with AEs from other practitioners	18/20	19/20

The mean and range of shillings charged by the different practitioners is shown in Table 6. The cost of the procedure at the hands of a traditional circumciser is less than if done by a medical practitioner. Moreover, many of the practitioners levied additional charges for related services. For example, many of the medical practitioners charged the client for a tetanus shot administered before the procedure. A few gave antibiotics routinely – some charged for the medication, while others did not. If a client returned with a complication, the medical practitioner would often charge an additional fee for his services, which could range from simple re-dressing to re-exploring and resuturing the wound. In one case that we followed, because of repeated complications requiring multiple visits and three courses of antibiotics, a family ended up paying

3,000 shillings for a procedure that originally cost only 700. However, such cases are not common. Most medical practitioners charged minimally, if at all, for return visits, as long as they were to address a complication resulting from a procedure performed by that same practitioner.

Traditional circumcisers were seldom called upon to address complications resulting from a procedure performed by them. The traditional circumciser's role seems to be limited to performing the ceremony. If a complication from a traditional circumcision needs to be addressed, a different person is called upon; this may be a local village shaman, a "traveling nurse," who provides dressing and antibiotic powder (gravacine), or a certified nurse or Clinical Officer who lives nearby or is willing to come to the village. In other cases, the family will take the boy to a health facility where he can be treated by a qualified medical practitioner. In these cases, the costs of treatment can be high, because the practitioner is addressing a problem created by someone else, and he seems more willing to charge higher fees than if he were addressing a problem created by his own hand. In the case of one young man who was circumcised by an unqualified medical practitioner for 400KS, then taken to a Health Centre and then later required to go to the District Hospital for resurgery, the total charges amounted to 3200KS.

In sum, the amount charged by the practitioner for the procedure may not reflect the true ultimate cost by the time the wound is fully healed. If there is a complication, which, as we have seen, there is in 25% of cases, then the cost may be significantly higher. Since there are twice as many complications arising from traditional circumcisions, the total cost to the family is likely higher in these cases than in cases done by medical practitioners. Moreover, it is important to emphasize that, with traditional circumcision, the charges for the procedure itself and any ensuing treatment, are most often a small part of the total cost to the family. As a traditional rite of passage, circumcision is not just a surgical procedure, but an event that entails weeks or months of preparation and involvement of the extended family, with costly celebrations and rituals. The total cost to the family varies tremendously, but may reach into the tens of thousands of shillings. A circumcision performed by a clinician, on the other hand, may be a one time procedure costing only 350 – 2000 shillings. The family then has the option of celebrating the occasion if they wish and if they have the resources.

5.6 Instruments and Supplies Available at Health Facilities

These results indicate that public and private health facilities lack some of the essential items for performance of safe circumcisions. Most glaring is the need for sterilization equipment (autoclaves) and proper suture material.

It is difficult to perform circumcisions properly and safely if the instruments and supplies available are inadequate. For example, we found that the use of the improper gauge of suture material caused stitches to rupture. Dull scissors caused jagged wound edges. Inadequate bandaging may have caused infections, as could lack of an autoclave or inadequate sterilization procedures.

Therefore, we developed a list of essential instruments and expendable supplies necessary for performing circumcisions properly and safely. Inventories of these items in each of 18 facilities are shown in Table 7. To be recorded, all instruments had to be in working order.

Table 7. Inventories of instruments and supplies necessary for circumcision at public and private facilities in Bungoma District, Kenya.

INSTRUMENT/SUPPLY	PUBLIC FACILITY		PRIVATE FACILITY	
	N = 4		N = 14	
	#	%	#	%
Long straight forceps	4	100	14	100
Needle holding forceps	4	100	13	93
Suture needles	4	100	13	93
Scissors	4	100	14	100
Autoclave	2	50	3	21
Other sterilizer	4	100	11	79
Sutures (3/0)	2	50	8	57
Lidocaine	4	100	14	100
Syringes	4	100	14	100
Savon or other antiseptic	n/d	n/d	14	100
Gauze and bandages	4	100	13	93
Antibiotics	3	75	13	93

The public health facilities, which included the District Hospital and three health centres, were fairly well provisioned with the exception of autoclaves and proper sutures. Two health centres did not have working autoclaves and instead used pressure cookers. Two did not have sutures available. The cost of a circumcision in a public facility is supposed to include all the supplies necessary, but in many cases the supplies simply are not available. Thus it is not uncommon in public facilities for the staff to instruct the patient to go to a pharmacy to buy his own sutures or other materials, such as lidocaine or bandages. The cost of sutures, which come in a packet with a suture needle, is about 250KS (\$3.35). The public facilities tended not to have antibiotics available; these were generally prescribed when appropriate and the patient was sent to a nearby pharmacy to purchase them.

The private facilities were less well equipped. Only three of the 14 facilities had autoclaves. Some used pressure cookers to sterilize the equipment, but others simply boiled the instruments in a pot over a gas stove. Depending on the length of time the instruments are boiled, this is probably adequate for sterilization, but it is extremely tough on the instruments, causing them to break down very quickly and to not work properly. Like the public facilities, about half the private practitioners had the proper sutures on hand. Some had 1/0 and 2/0 sutures, while others

had no sutures at all. Some of these may have performed circumcisions on boys and young men without stitching – this was seen in four of the 12 medical cases that we observed directly – while others may have used the larger suture material, which tends to result in ruptures and crimping of tissue causing unnecessary swellings.

These results indicate that public and private health facilities lack some of the essential items for performance of safe circumcisions. Most glaring is the need for sterilization equipment (autoclaves) and proper suture material. In the absence of autoclaves, it is difficult to know what sterilization techniques practitioners are employing, although use of pressure cookers and boiling pots seem to be common. Remarkably, the facilities in Bungoma are better provisioned than similar facilities in Nyanza Province (Mattson et al. 2004). This is likely because few circumcisions are performed in Nyanza, since the predominant ethnic group in Nyanza is the Luo, who traditionally do not practice male circumcision. Health facilities in Bungoma District are more likely to have circumcision instruments on hand, since they are called upon to perform the procedure on large numbers of Bukusu males every two years. Nevertheless, there are clearly gaps that need to be filled. If safe circumcision services are to be promoted and sustained in Bungoma District, provision of the proper instruments and supplies must be assured. Moreover, practitioners will have to be trained on proper use of these provisions. For example, many may not know how to use an autoclave, and we have seen that many do not know stitching techniques nor proper bandaging methods, nor do they counsel patients on proper post-op wound care.

5.7 Summary of Focus Group Discussions

The results of the 21 focused group discussions (FGD) will be reported in much greater depth by Omar Egesah in his doctoral dissertation and in papers submitted for publication. We here provide a brief summary of the results to provide qualitative information about the factors that Babukusu take into account when making the decision whether to seek circumcision from a traditional or medical practitioner. The results are summarized in bullet form.

5.7.1 *The disadvantages of traditional circumcision*

- Higher costs
- Much pain
- Fatigue experienced during the long period of ceremonies
- Distraction from school – lack of concentration on education over a long period – May through December.
- High risk of HIV infection through sharing of the knife
- Burden of hosting people for elaborate ceremony
- Traditional rites go against Christian teaching
- Destruction, rowdiness, seduction and sex
-

5.7.2 *The disadvantages of medicalized circumcision*

- Goes against community norms. Boys risk stigmatization and ridicule for not undergoing the traditional rites, as do parents of the boy.
- Unable to participate in some rites and rituals which are beneficial and an important part of becoming an adult Bukusu.

5.7.3 *The advantages of traditional circumcision*

- The boy receives advice on his role in society and his responsibilities as a man and husband.
- Adherence to the norms of the society, of making a man.
- Sense of community and solidarity with peers.
- Gifts and rewards that accrue to the boy and his family from relatives and friends.

5.7.4 *Advantages of medical circumcision*

- Lower cost allows parents to save for school fees.
- Healthier and safer: more hygienic; less risk of infection; less risk of mutilation; heals faster; no HIV risk; less pain
- No lawlessness, destruction, vulgarity, sexual activity, which is common during the activities surrounding traditional circumcision.
- Privacy

6.0 DISCUSSION AND CONCLUSIONS

6.1 High Rates of Complications

This study found that the prevalence of adverse events (AEs) from traditional and medical circumcisions in Bungoma District, Kenya, is an order of magnitude higher than clinical circumcisions performed on infants in developed countries and much higher than previously reported from African medical settings (Magoha 1999; Manji 2000). The overall rate of AEs was approximately 25%, with 35% of those circumcised traditionally experiencing at least one AE, and 17% of those circumcised medically experiencing an AE. This is compared to a rate of 1.7% complications in the clinical setting of a randomized controlled trial of MC in Kisumu Kenya (Krieger et al. 2005), and a 3.8% rate in the setting of private practitioners performing circumcisions for participants in the RCT of MC in Orange Farm, South Africa (Auvert et al. 2005). While most of the AEs we observed resolved by 90 days post-op, an unacceptable proportion did not, and the long periods of healing, inactivity, and additional costs to families imposed unnecessary suffering and financial costs on young men and their families. Moreover, we estimate that approximately 6% of procedures resulted in permanent adverse sequelae. Most of these were mild in the form of incomplete circumcision, poor cosmesis, and mild torsion, but others were more serious and included pronounced torsion, lack of penile sensitivity, mutilation, and erectile dysfunction. Serious permanent AEs, including death, may have been more frequent had the study team not intervened. The team Clinical Officer cleaned infected wounds and provided antibiotics in several cases; he re-operated in the case of one severe haematoma; and the team rushed to hospital one participant who was gangrenous, anemic, and extremely weak. It is not possible to know what the outcomes of these patients would have been in the absence of intervention by the study team.

The most common AEs that we recorded were excessive bleeding, infections requiring antibiotics, excessive pain, deep cutting with pronounced swelling requiring long periods for healing and resulting in excessive scarring, broken sutures with wound disruption, and jagged wound edges. Delayed healing was universal: none of the cases we observed were fully healed

by 30 days after the procedure, and 17% had not healed by 60 days post-procedure. This is in contrast to the approximately 1400 participants in the RCT of MC in Kisumu, all of whom had healed by their 30 day post-op visit. We also observed alarming prevalence of haematoma, torsion, lack of penile sensitivity, and erectile dysfunction 60 – 90 days after the procedure. Many circumcisions required post-op attention that is normally unnecessary in cases handled by qualified, experienced practitioners. Jagged wound edges, residual foreskin, and incomplete circumcisions required re-circumcision, which then often led to extensive tissue removal, a deep wound and unnecessary scarring. At very least, the jagged edges and frequently broken sutures resulted in poor cosmetic outcomes. Haematomas required re-exploration of the wound. The many infections required antibiotics - sometimes multiple doses before the infection was brought under control.

While most of the AEs we observed resolved by 90 days post-op, an unacceptable proportion did not, and the long periods of healing, inactivity, and additional costs to families imposed unnecessary suffering and financial costs on young men and their families.

6.2 The High Costs of Complications

In a society where circumcision is universal, young people have no choice but to be circumcised.¹ Under such conditions, they have a right to safe services and to be able to make informed choices about how the procedure is to be performed.

High rates of AEs impose costs on boys, parents, health facilities and civil society. The long periods necessary for proper healing take time away from school or from productive activities, such as helping in food production. The burden to parents and relatives for additional medical attention in this rural, high-poverty district can be financially crippling. The necessity for health facilities to address complications during the prolonged circumcision season diverts scarce resources from other essential services. Finally, the Babukusu and other societies that practice traditional circumcision undergo ridicule for

adhering to practices that are perceived by others in Kenya and elsewhere as primitive, wasteful of human resources, and exhibiting disregard for the rights of children and adolescents. In a society where circumcision is universal, young people have no choice but to be circumcised.¹ Under such conditions, they have a right to safe services and to be able to make informed choices about how the procedure is to be performed.

¹ Incidents of forced circumcisions are legend in Bungoma as they are in other regions where male circumcision is traditionally practiced (e.g., among the Bagisu in Uganda; Kitutu 1994). Young men who refuse to be circumcised or who go beyond a certain age without undergoing the procedure have been attacked and put through the procedure against their will. During circumcision season, men from the Luo or other non-circumcising ethnic groups leave Bungoma District because there are occasional incidents of men being forcefully circumcised if they remain in the area.

It became apparent that many AEs could be avoided if initiates and their parents were given clear and comprehensive instructions on wound care. Unhygienic conditions are a major problem in settings where access to water is difficult; however, most problems arose from lack of knowledge about how to care for the wound. Penicillin powder (gravacine) was very commonly applied to the wound; this was true in cases of both traditional and medical circumcisions and is a common practice in many African settings. The powder became caked in the wound, slowed healing, and resulted in thick scarring and in some cases discoloration. Bandaging often consisted of soiled cloth or gauze that was applied repeatedly. The wound often went many days without cleaning, and when bandages were removed, the wound reopened. In rural settings, leaves were sometimes used to dress the wound. Whether they have any medicinal properties is unknown.

Education of parents, guardians and the initiates themselves as to proper wound care and recognition of when medical assistance should be sought could reduce the frequency and severity of AEs significantly.

6.3 Lack of Knowledge About Post-Operative Care

Despite having gone through it themselves, there appeared to be a lack of knowledge on the part of fathers and older men about wound care or detection of complications. The prevailing approach to complications seemed to be to wait and see and hope for the best. This is likely in part because boys are expected to have difficulties. The older men themselves went through difficulties when they were circumcised, so excessive pain, swelling, slow healing, poor cosmesis, lack of erections, etc., may be expected. The threshold for determining when a boy needs medical care is very high under such circumstances. In addition, families are reticent to incur the costs of follow-up care, so they attempt to address complications themselves or with help from indigenous healers. Education of parents, guardians and the initiates themselves as to proper wound care and recognition of when medical assistance should be sought could reduce the frequency and severity of AEs significantly.

6.4 Need for Training of Practitioners

It became clear from both the observations of the circumcision outcomes and the interviews with medical and traditional practitioners that further training of practitioners is required. Even the majority of clinicians had not received formal, supervised training in circumcision techniques. Only Medical Officers have formal in-theater supervised training in surgical circumcision. Clinical Officers may observe circumcisions in training college, but seldom actually perform the procedure under supervision. Nurses get no formal instruction in MC. Given that roughly 80% of the Kenyan population belongs to ethnic groups that practice nearly universal MC and that many males will be circumcised by medical practitioners in public or private facilities, formal training in circumcision should be included in the curricula of training colleges and made part of the required supervised practica for Clinical Officers and Nurses. Roughly half of the medical practitioners whom we interviewed expressed a need for further training. Training should include pre-operative assessment, assessment of instruments, supplies and facilities, sterilization

techniques, patient informed consent, proper patient preparation, surgical procedures, pain management, post-operative care, counseling about wound care, recognition and treatment of AEs, and referral to tertiary centres. Currently, a technical working group convened by WHO is developing a training and reference manual for provision of circumcision in district hospitals and health centres. This should be available by mid-2006, and may serve as a good basis for a training program as well as a ready reference for practicing clinicians.

The need for training traditional practitioners is apparent. Given that they do not use sutures, it is imperative that they receive training in bleeding control. In addition, instruction in penile and preputial anatomy as well as control of sepsis, post-operative wound care, counseling of boys and parents, recognition of complications, and referral to hospital would also be beneficial. Approximately half of the traditional practitioners whom we interviewed said that they would welcome such training.

Consideration should be given to a certification process for practitioners who undergo approved training programs. There could be separate certificate programs for medical practitioners and traditional practitioners. This would assure parents and young men that practitioners meet certain minimal requirements, and families could choose their circumciser on the basis of certification, among other criteria. This might undermine the ability of unqualified practitioners to set up makeshift clinics and attract unsuspecting clients to low-quality services. Certification could include a promise to provide services within an affordable range.

Given that roughly 80% of the Kenyan population belongs to ethnic groups that practice nearly universal MC and that many males will be circumcised by medical practitioners in public or private facilities, formal training in circumcision should be included in the curricula of training colleges and made part of the required supervised practica for Clinical Officers and Nurses.

6.5 Need for Upgrading Instruments and Supplies

Even the best trained and most experienced clinician will have difficulty in keeping AEs to a minimum if he does not have the correct surgical instruments or expendable supplies at hand. Many of the AEs we observed were attributable to lack of instruments in good working order or use of the wrong suture material. For example, the high frequency of jagged wound edges and of residual foreskin was due to dull scissors or lack of scalpel. Frequent infections may have been caused by lack of functional sterilization equipment. Poor post-op wound care was in many cases due to insufficient fresh dressing material. If a practitioner is doing many circumcisions in a day and does not have several sets of instruments or inadequate sterilization equipment, he may be using the same instruments on several patients. This is a widespread concern among parents and boys regarding the practices of traditional circumcisers, but it may also be relevant to medical practitioners with limited resources.

Because medical practitioners compete for clients in part on the basis of the fees they charge, the costs of the surgical instruments and expendable supplies are a significant concern. Private

practitioners especially may be less likely to have instruments in working order, because the cost of replacement is beyond their means. They may not tie all the bleeders or may space the stitches widely because to use an additional packet of suture material would push the cost of the procedure beyond what they can charge the patient. So practitioners are at risk of compromising safety and quality of service in the interests of keeping their costs down. One implication of these observations is that quality and safety of practitioner services might be improved by providing practitioners with up-to-date instruments and sufficient expendable supplies. An alternative approach could be to supplement the cost, perhaps by distributing through pharmacies and vendors at-cost kits containing essential expendables (e.g., antiseptic, suture, suture needle, disposable syringe, lidocaine, soffitelle, and bandages).

6.6 Early Sexual Activity

A prevailing sentiment is a general sense that traditional circumcision is backward, wasteful and no longer relevant in a day when families are struggling to scrape together school fees and placing increasing emphasis on education to enhance employment opportunities in a competitive economy.

It is apparent from our results that interventions are needed to reduce the high rates of complications associated with both traditional and medical circumcisions. Additionally, our results show that this sample of young men were sexually active at early ages. The median age at sexual debut was between 14 and 15 years. Approximately half the young men were sexually active before they were circumcised, more in those circumcised traditionally (63.1%) than those circumcised medically (35.5%).

The odds of having had sex before circumcision were 3.11 times greater for those circumcised traditionally than those circumcised medically, after adjusting for age at circumcision. And those circumcised traditionally were more likely to have resumed sexual activity 60 days after their circumcision than those circumcised medically. This is especially troubling because the wounds of 24% of those circumcised traditionally and 19% of those circumcised medically had not fully healed when they were observed at 60 days post-op.

These data regarding sexual activity before and after circumcision along with extended post-op healing times have the following implications:

- Behavioral interventions including the ABCs of HIV prevention should begin early - in primary school-aged children – before boys are circumcised.
- Consideration should be given to promoting earlier age at circumcision to ensure that the procedure is performed before onset of sexual activity.
- Improving the quality of MC services could reduce healing times and thus reduce risk of HIV infection in those who resume sexual activity soon after circumcision.
- Counseling males not to engage in sex until they are fully healed must be included in post-op instructions.
- Circumcision cannot be a stand alone procedure; it must be integrated with behavioral and reproductive health counseling in order to minimize both complications and risk of HIV infections.

6.7 Preference for Medical Circumcision

Finally, during the focused group discussions and interviews with adults, it became clear that many – probably the majority – of the Bukusu would prefer that their sons and brothers be circumcised by medical practitioners. The advantages they cite are listed in Section 5.8 above. The two most salient reasons are the lower cost and the safety, but a prevailing sentiment is a general sense that traditional circumcision is backward, wasteful and no longer relevant in a

day when families are struggling to scrape together school fees and placing increasing emphasis on education to enhance employment opportunities in a competitive economy. The partying, rowdiness and distraction from education that accompanies traditional circumcision, combined with the pain and suffering experienced by the boys, reinforces the reluctance to spend limited family resources on an act that can be achieved quickly and privately at minimal cost. There was also the sentiment that traditional circumcision is anti-Christian, primarily because of all the rituals and ceremonies involved. These sentiments against traditional circumcision practices were expressed most often by women; whereas men, especially rural older men, were more likely to prefer to stick with the tradition of circumcising in the village with all the culturally appropriate fanfare. Nevertheless, our impression was that most Bukusu would prefer circumcision to take place in a medical setting. However, the prospect of social pressure and possible stigmatization was a powerful deterrent against change. Males especially were fearful of being stigmatized in their community for not going through the traditional rites. Women seemed less concerned about this and more concerned about safety for their sons and the costs to the family.

Our impression was that most Bukusu would prefer circumcision to take place in a medical setting. However, the prospect of social pressure and possible stigmatization was a powerful deterrent against change.

These findings are consistent with what was found by the Anglican Church of Kenya when they introduced mobile medical circumcision clinics. Initially, they found widespread reluctance on the part of Bukusu families to commit to medical circumcision. However, once several church leaders and local chiefs endorsed the program, there was a rush by literally thousands to sign up, and the providers had many more clients than they could possibly service. Their interpretation was that there was a hidden pent up demand for medical circumcision services that was released only once respected community leaders signaled that the practice was acceptable. This lifted the risk of ridicule and stigma from the shoulders of parents, and they embraced the program with open enthusiasm.

Our qualitative research suggests that similar programs would be successful in other areas of Bungoma District and perhaps elsewhere. While every community has its own special circumstances, it is possible that similar pent up demand for safe, affordable MC services exist in other east and southern African communities where most circumcisions are currently being done by traditional practitioners. There may be opportunities waiting to be exploited to shift

circumcision practices to more clinical settings and to combine safer surgical practices with HIV prevention and male reproductive services.

7.0 RECOMMENDATIONS AND POINTS FOR FURTHER DISCUSSION

Any recommendations that arise from the results of this study must be considered preliminary and are offered as points for discussion especially by members of the Bukusu community and the Ministry of Health of Kenya, but also by the wider African and international health community as deliberations go forward concerning the possible widespread promotion of male circumcision in East and southern Africa.

- The Bukusu community and the MOH should hold consultations as soon as possible to discuss ways of addressing the appalling rates of morbidity associated with what is a universal and culturally obligatory practice, male circumcision, in Bungoma District and in many other communities in Kenya and elsewhere in Africa. There should be a sense of urgency, as 1000s of young men are at risk annually of unnecessary suffering and possible permanent disability.
- Assess whether our findings for Bungoma are unique or common to other areas of Kenya and sub-Saharan Africa. Additional studies are needed of complication rates and MC practices in regions where circumcision is currently widely practiced among adults, children and neonates.
- Traditional practitioners should receive training. This should include: basic anatomy; cutting techniques; how to arrest bleeding; bandaging; correct and complete post-op directions to boy and parents; when to refer clients to health a facility; counseling of boys in ABC, matters of reproductive health, and healthy gender relations.
- Clinicians should receive training. This should include: pre-op counseling of the patient and guardian; obtaining informed consent; assessment and maintenance of instruments and supplies; surgical techniques; post-op care; complete and correct post-op counseling of the patient and guardian; minimization of costs and patient charges; recognition and treatment of complications; counseling of boys in ABC, matters of reproductive health, and healthy gender relations.
- Consideration should be given to whether practitioners should be certified after going through a best practices training program. Certification could be different for clinicians and traditional circumcisers.
- Health facilities should be monitored for presence and maintenance of proper surgical instruments and supplies.
- Consideration should be given to means of reducing the costs of clinical circumcision. One possibility would be to make commercially available at low cost a kit containing

necessary consumables, including antiseptic, sutures, suture needles, lidocaine, disposable syringe, sofritle, gauze and tape.

- Parents and young boys should be informed and educated about:
 - How to choose a circumciser based on information about: differences between traditional and medical circumcision; experience of the circumciser; charges for specified services; recommendations from others; and possibly certification (see above).
 - Post-operative care: cleaning and bandaging of the wound; expectations for bleeding, infection and healing; when to bring the boy to a health facility.
 - Some ritual and ceremonial practices that may expose the boy and community to risks (e.g., smearing with mud, partying, sexual behavior).

Roughly two-thirds of males in Africa are circumcised, many, if not the majority, by traditional circumcisers or practitioners in the informal sector. This is the first study we know of that has followed a sample of young men from before until weeks after the circumcision. If the results of this study are indicative of situations in the many other communities throughout Africa where MC is widely practiced, there is urgent need to address on a broad scale the many problems we detected in this one community. This is the case whether or not MC is ever to be promoted as an HIV prevention intervention. Moreover, if MC becomes widely promoted for health reasons, new opportunities for traditional and unqualified practitioners will emerge. Unless the international public health community addresses the issues highlighted by this study, any gains to be achieved by this new potentially effective intervention could be mitigated by unnecessary suffering and morbidity.

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