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“The Demand for Medical Male Circumcision”

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THE DEMAND FOR MEDICAL MALE CIRCUMCISION

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Abstract

This paper measures the demand for adult medical male circumcision using an experiment that randomly offered varying-priced subsidies and comprehensive information to 1,600 uncircumcised men in urban Malawi. We find low demand for male circumcision: only three percent are circumcised over a three month period. Despite the low overall level of take-up, both price and information are significant determinants of circumcision. Still, the main barriers to male circumcision – cultural norms and fear of pain – are not affected by prices or information. Significant demand generation efforts are needed for this HIV prevention strategy to be effective.

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Recently, three randomized control trials have found that medical male circumcision reduces the likelihood of contracting HIV for men by up to 60 percent (Auvert, et al., 2005; Bailey et al., 2007; Gray et al., 2007).\footnote{The effectiveness of male circumcision ranged across the three countries: South Africa at 60 percent, Kenya at 53 percent, and 55 percent in Uganda. In Uganda, 45 percent of eligible men agreed to participate. After the close of the study, 80 percent of men in the control group who were offered circumcision agreed to be circumcised (CHIPTS, 2008). Among a minority of researchers there is still a debate regarding the link between male circumcision and HIV (see for example, Mills and Siegfried (2006) or Dowsett and Couch (2007)).} Given these findings, in 2007 the WHO and UNAIDS officially recommended voluntary medical male circumcision (VMMC) as an important HIV prevention strategy and called for scale-up in 14 high priority countries in Eastern and Southern Africa (WHO, 2007). Since then, there has been global mobilization for scaling up male circumcision in high HIV prevalence areas.

Results from simulations and meta-studies support the claim that male circumcision is one of the most cost-effective HIV prevention interventions. The most recent simulations suggest that scaling up medical male circumcision to 80 percent coverage in priority countries could avert approximately 22 percent HIV infections through 2025, resulting in a net savings of $16.51 billion (Njeuhmeli et al., 2011).\footnote{See also Williams et al. (2006), Nagelkerke et al.(2007), White et al. (2008), UNAIDS/WHO/SACEMA (2009), Hankins et al. (2011), and WHO (2011).} However, to reach this target, more than 20 million 15 to 49 year old men must be circumcised, by 2015. Given this ambitious goal, it is important to understand the demand for adult medical male circumcision in Africa.

Prior acceptability studies have been limited to focus groups or surveys asking uncircumcised men whether they would be willing to get circumcised. Aggregate statistics of the number of men circumcised in a particular area also do not provide sufficient information to estimate demand because it is unknown how many men chose not to get circumcised. Still, media reports imply very high demand for medical male circumcision and journalists report long lines at clinics...

This study is the first to our knowledge that quantifies the actual demand for voluntary adult medical male circumcision. In addition to measuring the level of the demand, we also estimate how it varies by randomly set prices and randomly shared information about the benefits of male circumcision against HIV infection. Price and information interventions are most commonly used to increase the take-up of health goods in developing countries and it has been suggested that these also would be important for the adoption of male circumcision.

The data for this study were collected in urban Malawi in collaboration with a private clinic providing voluntary adult medical male circumcisions as an integrated part of their regular reproductive health services. A baseline survey was conducted among a representative sample of approximately 1,600 uncircumcised adult men in the catchment area of the clinic. At the end of the baseline survey, each respondent received a voucher for a subsidized male circumcision at the local partner clinic with the amounts of the vouchers randomly assigned. In addition, approximately half of the men were told detailed information about male circumcision and HIV transmission. Data from the clinic were collected and follow-up interviews conducted one year later indicating whether men had been circumcised.

We find low demand for medical male circumcision: three percent of the men interviewed at baseline were recorded as being circumcised at the clinic. Despite the low take-up, the subsidy had a significant impact on the demand for medical male circumcision: decreasing the price from 6 dollars to free increased the probability of circumcision by 3.1 percentage points. We also find a significant difference in take-up among those who were given detailed information about circumcision and HIV: those given additional information increased their
likelihood of take-up by almost two percentage points. There was no significant interaction between information and price.

Due to the small sample size of those who were circumcised, our ability to estimate which types of men select into the surgery is limited. However, we do find some suggestive evidence. Not surprisingly, those who reported as willing to be circumcised at baseline were the most likely to get a medical circumcision. Men living closer to the clinic or who had heard that others had been circumcised at the clinic were more likely to get circumcised. Ex-ante risk may also predict selection into male circumcision: men who used a condom that last time they had sex and those who had fewer sex acts in the past month are more likely to get circumcised in our data. If men who are least at risk of HIV are most likely to adopt male circumcision, universal male circumcision roll-out campaigns will be less cost-effective than estimates suggest. However, we caution generalizing these results given the small sample of men who take-up circumcision.

While price and information were important barriers for some men, simply providing free medical circumcisions and comprehensive information was not enough to motivate most to get circumcised. At baseline, the most common reasons men cited were cultural or religious norms or the fear of pain from the surgery. While the information and price of circumcision significantly affected attitudes towards future circumcisions along some dimensions, there were no impacts on views about norms or pain.

There are several important limitations to our findings. First, the study was conducted during the initial phases of male circumcision scale-up in Malawi. It may be that future demand increases with more government support, information campaigns, and with increased male circumcision acceptability within the population. Second, our analyses measuring the determinants of take-up are identified off of a small sample and the results should be interpreted with this in mind. Third, our results do not speak to the effect of negative prices on the
demand for male circumcision, which may be one way that would stimulate demand, especially given the physical and psychological costs of the surgery.

Still, our results have significant policy implications and make important new contributions to the literature. First, the demand for medical male circumcision may be much lower than previous acceptability studies or media reports suggest. Second, simply providing free medical male circumcisions and information about male circumcision and HIV transmission was not enough to generate sufficiently high demand that would induce significant population level benefits. Moreover, these interventions had no impact on changing attitudes about cultural and religious norms about male circumcision or the fear of pain from the surgery. The implication of our results is that reaching the goal of circumcising 80 percent of adult men by 2015 may be much more difficult than merely increasing the supply of free circumcisions.

The paper proceeds as follows: Section 1 presents background information on male circumcision and what is known about the determinants and barriers to take-up. Section 2 presents the data and experiment. Section 3 presents the results on male circumcision take-up. Section 4 outlines the empirical strategy to identify the effects of price and information on take-up. Results are presented in Section 5. Section 6 discusses other possible barriers to take-up and Section 7 concludes.

I. Background

A. Traditional Male Circumcision in Malawi

It is currently estimated that approximately 11 percent of adults are infected with HIV in Malawi, giving the country the 9th highest infection rate in the world (UNAIDS, 2010). Malawi was named as a high priority country for the scale-up of medical male circumcision not only because of its high HIV prevalence, but also because the majority of men (81 percent) are not circumcised (MDHS, 2010).
As in other African countries, the practice of male circumcision is deeply cultural and is typically conducted as part of an initiation to adulthood among adolescent boys (Stannus and Davey, 1913). In Malawi, 85 percent of those belonging to the Yao tribe are circumcised, typically during initiation ceremonies. In other tribes, male circumcision is not as prevalent with 21 percent of the Mang’anja, 32 percent of the Nyanja, and 30 percent of the Lomwe circumcised (MDHS, 2010). Other tribes such as the Chewa, Tumbuka, Tonga, Sena, Ngoni, or the Nkhonde have much lower rates of circumcision. The rate of male circumcision is also highly correlated with religion; 94 percent of Muslims are circumcised.

B. Quantifying the Demand for Medical Male Circumcision

To reach the target of 80 percent male circumcision coverage, Malawi would need to circumcise over 2 million men (WHO, 2011). However, quantifying how many of those men will be actually willing to become circumcised is difficult. Anecdotally, media reports from several countries in Eastern and Southern Africa suggest a very high demand for medical male circumcision describing men lining up at clinics for a circumcision (Thom, 2009; PlusNews, 2010; Zimdiaspora, 2010). In Malawi, focus group discussions conducted in 2003 among 159 men and 159 women ages 16–80 years suggested that “many men and women would welcome male circumcision services if they were safe, affordable and confidential” (Ngalande et al., 2006). It is difficult, however, to rigorously quantify the true demand for male circumcision surgery from these reports.

One approach to quantifying the demand for medical male circumcision is to ask uncircumcised men if they would be willing to get circumcised. A meta-analysis of 13 sub-Saharan African countries found that the median willingness to get circumcised among uncircumcised men was 65 percent, ranging from 29 to 87
percent across countries (Westercamp and Bailey, 2007). In Malawi, approximately 37 percent reported that they would be willing to get circumcised in 2010 (Bengo et al., 2010). However, it is difficult to infer true behavior from hypothetical answers about the willingness to get circumcised (Muula, 2007; Westercamp and Bailey, 2007).

Another approach to quantifying the demand for male circumcision is to simply count the number of medical male circumcisions conducted within a country or region. By the end of 2010, just over 555,000 medical circumcisions were performed for HIV prevention in the 14 priority countries, representing approximately only 2.7 percent of the target. In Malawi, one estimate provided by the Ministry of Health reports that 3,119 medical male circumcisions were conducted in facilities across the country between 2008 and 2010 (WHO, 2011). However, many of these circumcisions may be substituting for traditional circumcisions. Records of the circumcisions conducted at health facilities in 2010 found that only 14.8 percent were adults; the remaining constituted infants, children and adolescents (Bengo et al., 2010).

These statistics may suggest fairly low demand for male circumcision; alternatively they may reflect limited supply or access. Moreover, facility-based reports of the number of men circumcised do not provide sufficient information to estimate how many men chose not to get circumcised; those statistics are missing the denominator that is needed to estimate demand.

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3 Households were sampled across selected districts based on the expected prevalence of male circumcision using the results of 2004 Malawi Demographic and Health Survey (MDHS 2004). The survey included men older than 18. Initially, 81 percent of men reported being opposed to circumcision. After being told about the benefits of male circumcision, this percentage declined to 63 percent.

4 Half of these were conducted in Kenya, achieving 27 percent of their national goal (WHO, 2011).

5 Another estimate from a Ministry of Health official in early 2012 suggested that “more than 5,000 men have so far been circumcised” (Irin Plus News, 2012).

6 One pilot program began offering free medical male circumcisions in 2010. A three month campaign increased circumcisions from approximately five men per month in the months preceding the pilot, to four men per week during the campaign. In total, 99 circumcisions were conducted (Jung, 2012). To reach this level of take-up, the program had to conduct intensive community sensitization at local markets including songs, question and answer sessions, short dramas, as well as brochures about medical male circumcision. Determining the actual fraction of men who demanded the service in
C. Determinants of and Barriers to Take-up

Previous studies have explored possible barriers to take-up of medical male circumcision; the majority, however, as discussed above, use hypothetical acceptance as a measure of demand rather than observing actual circumcisions. In addition, most are unable to determine causal relationships due to omitted variables that may be correlated to both demand and other factors.

Perceptions of the costs of a medical male circumcision have been reported as barriers to take-up. These include the perception of a long healing period, perceived pain associated with the surgery, lost wages, or the cost of the circumcision procedure itself (Lukobo and Bailey, 2007; Herman-Roloff et al., 2011; Westercamp et al., 2012).7

The belief or knowledge that circumcision is protective against HIV may also be an important determinant of hypothetical demand (Bengo et al., 2010; Albert et al., 2011; Westercamp et al., 2012). In a paper most similar to ours, Godlonton, Munthali, and Thornton (2013) measure actual male circumcision take-up among men living in rural Malawi. In that study, comprehensive information about male circumcision and risk of HIV infection was randomly allocated across villages. After one year, only seven men had gotten circumcised and there was no significant impact of the comprehensive information. One of the possible reasons for low take-up in that study is that the villages were quite remote and the distance to the closest clinic may have been restrictively far. In contrast, this

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7 Using estimates of willingness to pay from actual circumcision data in Kenya, Bailey, Muga et al. (2002) found that circumcisions at one clinic “increased significantly” when the price was lowered from 250KSH to 100KSH. However, because the price was not randomly assigned, it is not possible to attribute the increase in circumcisions explicitly to the price change. In the Malawi Circumcision Situational Analysis, uncircumcised men were asked how much they would hypothetically be willing to pay for a circumcision. About two thirds indicated they were willing to pay up to MK1,000 ($7) with approximately a fourth, preferring not to pay anything (Bengo et al., 2010).
paper studies an urban population living in close proximity to a well-known clinic.

Ex-ante risk preferences or risk type may also affect the demand for male circumcision. Men who face a high risk of HIV infection have the largest benefit of the surgery. Alternatively, if men who practice safe sex have a preference for safe behavior, they may have the highest demand for circumcision.8

With the exception of Godlonton, Munthali, and Thornton (2013), there are no studies to our knowledge that quantify the demand for, willingness to pay for, or selection into actual medical male circumcision. Our study fills this gap by first, providing an estimate of the demand for male circumcision by measuring the percent of eligible men in the study who obtain an actual circumcision; second, estimating the actual willingness to pay by comparing take-up between those randomly allocated various prices of circumcision; and third, estimating the causal effect of providing information about male circumcision and HIV on take-up.

II. Data and Experiment

A. Partner Clinic

While officially, government hospitals and clinics in Malawi offer medical male circumcisions free of charge, in reality, elective circumcisions are considered low-

8 Another possibility is that the decision to have a circumcision could also be influenced by a man’s desire to signal lower risk of HIV infection. While not observable prior to sexual intimacy, circumcision could signal that a man has lower risk of HIV infection. This could lead to riskier sex, or potentially safer sex, if a circumcised man can better negotiate for a partner who herself has lower risk. Risk compensation may be an important consideration in predictions of the marginal benefit of circumcision. If high risk men respond to the surgery with an increase in risky behavior then the marginal benefit from circumcision might be lowest for the risky types (Cassell, 2006; Kalichman et al., 2007). Most empirical evidence, however, suggests that risk compensation after circumcision is limited (Mattson et al., 2008; Godlonton, Munthali and Thornton, 2013; Wilson et al., 2013).
priority compared to other surgical procedures and are not readily available. To conduct our study, we partnered with a private provider that had begun offering circumcisions in 2010, becoming a leader in the private provision of medical male circumcision in Malawi. The clinic, which primarily offers family planning and basic health services, has over 31 branches covering the majority of the population in urban and peri-urban areas across the country. Importantly, the clinic follows a model in which patients are charged small fees for health services or products. In 2010, several branches of the partner clinic began offering circumcisions for a price of 950 Kwacha (approx. $6.75).

The circumcision procedure itself is an outpatient surgery that begins with a local anesthetic injection. Often clients report this to be the most painful part of the procedure. Dissolvable stitches are used and men are advised to return to the clinic for a follow-up visit; clients are given painkillers to take for several days after the surgery. There is a recommended six-week period of sexual abstinence and most men resume work within two to three days after the surgery. Those who do sedentary jobs can often resume work immediately after the procedure.

B. Survey Data

The survey data were collected within the catchment area of one partner clinic branch in the capital city of Lilongwe. The catchment area constitutes 29

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9 More commonly, government and CHAM facilities serving populations that traditionally circumcise offer medical male circumcisions services during certain times of the year when most traditional initiation ceremonies take place. In a 2010 assessment of service providers, less than 30 percent of community hospitals had the capacity to begin offering medical male circumcision (Bengo et al., 2010). In addition, a separate analysis of Malawi’s medical staff found a 62 percent vacancy rate across the country (Lawson et al., 2008) and according to Mary Shawa, the Principal Secretary at the time for HIV/AIDS and Nutrition in the Office of the President and Cabinet, “only 4 percent of the country’s medical staff have been trained to carry out the surgical procedure” (Irin Plus News, 2012).

10 Not until October 2011 did the government adopt medical male circumcision as part of their national HIV prevention strategy and thus access to services are limited as policy leaders have called for caution in scaling up (Namangale, 2007; Tenthani, 2010)

11 This fee covered all surgery expenses, pain medications, follow-up review, and the treatment of any complications. The clinical protocol for an adult male circumcision at the partner clinic includes group education, individual counseling and STI screening, referral for voluntary testing HIV testing and post-test counseling.
enumeration areas as defined by the Malawian National Statistics Office. Each enumeration area was subdivided into a total of 114 neighborhood blocks which were demarcated using roads and rivers as natural dividing lines. Blocks were randomly selected into the study, stratified by enumeration area. On average there were 4 blocks per enumeration area.

Within each selected block, a household census was conducted in which men who were eligible for the study were identified. Eligibility was defined as any man – regardless of circumcision status – who was a permanent resident in the household and between the ages of 18 and 35 years. In households with more than one eligible man, one man was randomly selected as the target respondent.12

After the selection of an eligible respondent and obtaining informed consent, the baseline survey would commence, first with questions to determine the respondent’s circumcision status. The full survey was only administered to uncircumcised men. In total 1,634 uncircumcised men completed baseline surveys. Follow-up surveys were conducted in 2011, approximately one year after the baseline in which 77 percent of the men who were interviewed at baseline were re-interviewed.13 We use two samples in our analysis, the full sample of 1,634 men interviewed at the baseline and the follow-up sample of 1,252 men who were interviewed at both the baseline and the follow-up.

C. Randomization

Immediately after the baseline survey, each respondent was given a voucher for a subsidized circumcision at the partner clinic branch, valid for approximately three months. Vouchers contained a voucher ID that could be linked to each

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12 Data from the Demographic and Health Survey of Malawi finds that 23 percent of men living in urban areas in the Central Region (where Lilongwe is located) were circumcised. This is slightly higher than the 19 percent male circumcision prevalence rate across the entire country.

13 The attrition rate is relatively higher than other panel studies in rural Africa mainly due to the high mobility of men living in an urban area (Anglewicz et al., 2009).
respondent, the name of the respondent, as well as the type of photo ID which would be used to redeem the voucher.\textsuperscript{14} The value of the vouchers ranged from a full subsidy in which the circumcision was free, to a small subsidy in which the respondent had a 50MKW discount ($0.33) and had to pay 900MKW ($6).\textsuperscript{15} Vouchers were randomized at the individual level.\textsuperscript{16} Data from the Integrated Household Survey (IHS 2004/05) reveal that average daily wages in Lilongwe for men were 127MKW per day with a median of 100MKW per day. Thus for some respondents, the cost of the surgery was significant and the vouchers would be viewed as a significant discount.\textsuperscript{17}

Half of the respondents were also randomly assigned – by day of the initial household census – to receive comprehensive information about male circumcision and HIV. Men receiving comprehensive information were informed that circumcision is partially protective against HIV transmission. Interviewers explained the results from the three randomized control trials in Uganda, South Africa and Kenya. Information was also provided about some of the medical reasons why circumcision is partially protective. Those who did not receive the comprehensive information were simply told about the partner clinic’s services and that male circumcision was available there. On average, 11 additional minutes were spent administering the baseline survey among those assigned to the information group (not shown).

\textsuperscript{14} Respondents were asked in the first section of the baseline questionnaire what type of photo ID they had (e.g., voter ID, driving license, school ID). The ID type was written on the voucher to prevent voucher transfers. 14.5 percent of respondents had no photo ID.
\textsuperscript{15} Note that every man who participated in the survey received a voucher that subsidized the price of a circumcision. This was done to insure a credible link between the respondent and clinic attendance (there would be little incentive to bring a voucher worth nothing to the clinic). The distribution of the vouchers included 24.17 percent full subsidy; 25.48 percent 50MKW price; 13.55 percent 100MKW price; 13.18 percent 200 MKW price; 12.93 percent 400 MKW price; and 10.68 percent 900 MKW price.
\textsuperscript{16} Vouchers were placed in sealed envelopes and stapled to the back of the questionnaire; questionnaires were given to enumerators in random order, shuffled by the authors. There is no significant difference in the distribution of vouchers allocated as compared to what was intended (not shown).
\textsuperscript{17} Other experiments in Malawi have found large responses to small incentive amounts. One study offered cash incentives to learn their HIV results after testing found that 10 Kwacha increased the likelihood of traveling for HIV results by almost 20 percentage points (Thornton, 2008). Another study randomly offered 30 Kwacha to individuals for one day’s work found that 80 percent of individuals showed up for work (Goldberg, 2012).
Table 1 presents the summary statistics for the full sample of the 1,634 men interviewed at baseline. The sample consists of men who are on average almost 27 years old and relatively well educated, completing eleven years of school. Individuals spend approximately $142 (21,325MK) per month on various expenses (median of $99). Just more than 17 percent of the respondents are from a circumcising tribe, defined as a tribe with over 20 percent circumcised men in the Demographic and Health Survey (MDHS, 2010). Most men in the sample have ever had sex (87.5 percent; not shown), and have had approximately 4.2 sexual acts in the past month. Just less than half of the men (46.1 percent) report abstaining from sex in the past month with almost 6 percent reporting having multiple partners. Of those who had sex in the last month 39.5 percent report using a condom the last time they had sex. On average, 21.7 percent of the sample report they have a high likelihood of being currently HIV-positive. Just under half (48 percent) have ever had an HIV test.

We asked a number of questions to elicit perceptions about male circumcision. When asked about their beliefs about male circumcision and HIV, 49 percent had the correct prior belief that circumcised men were less likely to contract HIV. Almost half of the men (49 percent) reported that they were willing to be

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18 Our sample is generally similar to other studies conducted in urban Malawi. For example, urban men living in the Central region in the MDHS (2010) had on average 7.7 years of education, 25 percent had used a condom at last sex, and 55.6 percent had ever been tested for HIV. The ethnic composition of respondents is not representative of the study area due to the fact that only uncircumcised men were eligible for the study; approximately one third of the men are Chewa (34.6 percent), 24.7 percent Ngoni, 13.5 percent Lomwe, 12.8 percent Tumbuka, and the remaining 15 percent include Nkhonde, Nyanja, Tonga, Yao and others (not shown).

19 Expenditures categories were: Clothes, fabric, or shoes, Medical expenses at a clinic, doctor, pharmacy, or traditional doctor, Food: maize, meat, vegetables, eating out, transportation costs, and cell phone minutes. We report pre-devaluation prices.

20 This includes the Yao, Mang’anja, Nyanja, and Lomwe.

21 To elicit these beliefs, respondents were asked about the perceived transmission rate for circumcised men and for uncircumcised men. Perceived HIV transmission probabilities are measured by the following: i) “If 100 circumcised men each slept with a woman who is HIV positive last night, how many of them do you think would get HIV?”; and ii) “If 100 uncircumcised men each slept with a woman who is HIV positive last night, how many of them do you think would get HIV?”
circumcised. This is slightly lower than the median acceptability rate of 65 percent from circumcision acceptability studies across Sub-Saharan Africa (Westercamp and Bailey, 2007), but higher than the Malawi Situational Analysis from Lilongwe where 37 percent reported the willingness to get circumcised (Bengo et al., 2010). On average, men lived approximately one kilometer away from the partner clinic and 19 percent had ever heard of someone getting circumcised there.

If men reported they were unwilling to get circumcised, interviewers inquired about the reason they were unwilling (Figure 1). The two most common reasons given were due to culture or religion (45.1 percent) or fear of pain (32.9 percent). Other important reasons included feeling they were too old (18.3 percent) or “just not wanting to” (7 percent). Fewer, 2.3 percent, reported not having enough information or seeing no benefit and ever fewer reported feeling they were not at risk, being too busy, facing family objections, that the surgery was too expensive, or that they were too busy.

### III. Take-up of Voluntary Medical Male Circumcision

To measure the demand for medical male circumcision, we use two sources of data: clinic data and follow-up survey data. The clinic provided data on each voucher redeemed for an adult medical male circumcision up to six months following the start of the baseline survey. These data were recorded by intake nurses at the time that a respondent presented his voucher. In addition to clinic data, the follow-up surveys asked the respondent if he had received a circumcision in the past year.

Table 2 presents the take-up of male circumcision from the clinic and survey data. Out of the 1,634 men who were interviewed at baseline, the clinic reported

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22 Men’s responses were coded after being allowed to respond to an open ended question.
that 43 vouchers were redeemed, a take-up rate of 2.63 percent (Panel A). Restricting the sample to the 1,252 men who were also interviewed at the follow-up, the take-up rate was 3.3 percent, as measured by redeemed vouchers (Panel B). Of the 41 men who had clinic records and who were interviewed at the follow-up, the majority, 35, reported having a circumcision at the clinic during the validity period. The remaining 6 reported not being circumcised (Panel C).

The follow-up survey provides additional information about the demand for male circumcision. First, 26 percent report that they had some interaction with the partner clinic; examples of these interactions are undergoing circumcision surgery, being counseled, making a visit or a phone call to the clinic to inquire about circumcision (Table 2, Panel B). In addition to the vouchers redeemed at the clinic, an additional 70 men report having received a circumcision. Of these, 25 reported getting circumcised at either a non-partner clinic or traditionally, 9 reported getting circumcised at the partner clinic but after the expiration date of the vouchers, and 36 reported getting a circumcision at the partner clinic while the vouchers were still valid. Men may report getting circumcised when in reality they did not. This may be the case especially for the 36 men who reported receiving a circumcision at the partner clinic during the validity period but there was no voucher collected. On the other hand, vouchers may have been misplaced or records not accurately kept during intake or at the time of the surgery.

In total, the rate of take-up was between 3 percent – using clinic data only – and 8.9 percent – from either clinic or survey data.

IV. Determinants of Take-up: Empirical Strategy

Undergoing a medical male circumcision is a big decision. To some, the low circumcision take-up rate in our study may not be surprising given the financial,
social, and psychological costs associated with the surgery. On the other hand, some men did get circumcised; understanding the determinants of take-up may provide insights that could benefit medical male circumcision scale-up efforts. Because price and comprehensive information were randomly allocated at the baseline, we can measure the causal effect of these factors. We also examine how various personal characteristics are correlated with take-up. Importantly, because of the low overall rate of take-up, the results in this section should be interpreted as suggestive, as they may not be generalizable to other settings or in cases in which there is higher demand.

To estimate the determinants of the take-up of male circumcision, our preferred specification is:

\[
Y_{ij} = \alpha + \beta_1 \text{Free}_{ij} + \beta_2 50_{ij} + \beta_3 100_{ij} + \beta_4 200_{ij} + \beta_5 500_{ij} + \beta_6 \text{Info}_{ij} + \\
\gamma'X + \epsilon_{ij}
\]

We are interested in three different outcome measures, \(Y_{ij}\) for individual, \(i\), living in neighborhood block, \(j\): (i) circumcised based on clinic data, (ii) circumcised based on clinic data and self-reported circumcisions at the partner clinic within the voucher validity period, and (iii) having had any interaction with the partner clinic.

To estimate the impact of price, we use a flexible specification with indicators for each price point. \(\text{Free}\) indicates whether an individual was offered a free circumcision, and \(50, 100, 200,\) and \(500\) are indicators of the amounts needed to pay for male circumcision at the partner clinic (900MKW is the omitted category). \(^{23}\) \(\text{Info}\) is an indicator of whether the respondent was assigned to receive the comprehensive information about circumcision. The vector of baseline

\(^{23}\) The coefficient on log price on circumcision take-up from the clinical records is -0.0031 (p-value = 0.000; no controls).
variables, $X$, include: age, age squared, logged total expenditures, years of schooling, indicators of belonging to a circumcising tribe, being willing to be circumcised, believing his risk of having HIV was high, having ever had an HIV test, the interaction of belief of high risk and having an HIV test, having heard of anyone who was circumcised at the partner clinic, correctly believed that circumcision was associated with lower risk of HIV, distance to the clinic, number of sex acts in the last month, and indicators for whether the respondent used a condom at last sex, abstinence in the last month, and multiple concurrent partnerships. For covariates with missing values, we impute the median and include a dummy indicating whether or not the covariate is missing.

We estimate (1) above linearly, although probit estimates do not yield qualitatively different results. Robust standard errors are clustered by block (the primary sampling unit) and by day (the unit of randomization for the information treatment).

Because the voucher amount and information were randomly allocated to respondents, the error term is uncorrelated with $\beta_1$ through $\beta_6$ allowing us to measure the causal effects of price and comprehensive information on the demand for circumcision. If the subsidy had not been randomized, the price of circumcision may have been correlated to endogenous price changes, such as underlying community demand for male circumcision or government pressure to receive a circumcision. Similarly, if information had not been randomly assigned, the knowledge about male circumcision and HIV risk would likely be correlated with other factors such as risk preferences, education, or underlying propensity to get a circumcision, biasing the estimates of the effect of information.

The main assumption allowing for estimating the causal effects of price and information is that those facing different prices of male circumcision or learning comprehensive information are similar along observables and unobservables. Table 1, Column 2 presents, for each baseline variable, the p-value of a t-test of
equality of the average values of the baseline characteristic across information treatment groups. Similarly, Column 3 presents the p-value of an F-test of joint equality of the mean values of each baseline characteristic at the randomly assigned prices. For almost all of the baseline characteristics we cannot reject equality suggesting that the respondents in the information groups and each price group are balanced on key observable characteristics. In total, we tested 50 baseline characteristics and 16 percent were statistically significant at the 10 percent level across the different assigned prices; 12 percent were statistically significant across the information treatment or control groups.

In addition, there are also no significant differences in follow-up survey completion across the information treatment groups or assigned prices; the p-value of the joint test of significance for having a complete follow-up survey is 0.705 or 0.964, respectively (not shown). Attrition also does not differentially vary across price or information by baseline characteristics. To test this, we run separate regressions of being surveyed at the follow-up on each baseline characteristic, indicators for each information treatment (price), and interactions between the baseline variable and each information treatment indicator (price indicator). Column 4 and 5 present p-values from F-tests of joint equality of each of the interaction terms, across information treatment and prices, respectively.

V. Determinants of Take-up: Results

A. Price

Figure 2 illustrates the general relationship between price and the demand for male circumcision. It plots the take-up of male circumcision by price as measured by the clinic data. Take-up increases slightly from free to 50MKW and then
declines monotonically thereafter with increasing price. No one was circumcised who had to pay the highest amount.

Table 3, Columns 1 through 4 presents regression estimates from equation 1 of the effects of price on actual circumcisions as measured by the clinical records. Those offered a free circumcision were 3.1 percentage points more likely to adopt than those offered a circumcision for 900MKW. While the coefficient on being offered a price of 50MKW is higher at 4.1, these coefficients are not statistically significant from one another (p-value = 0.53). Results are similar if we include controls (Column 2) or restrict the sample to only those who had follow-up surveys (Columns 3-4).

If we expand our definition of circumcised to also include self-reported circumcisions at the partner clinic when the vouchers were valid, overall take-up is slightly higher, but the effects of price is roughly similar (Columns 5-6). There are also large and significant effects of price on having any interaction with the clinic (Columns 7-8). Those who received a higher subsidy were more likely to approach the clinic for more information or counseling, even if they did not choose to get circumcised at the end of that enquiry process. Those offered free circumcisions are 10.8 percentage points more likely to have interacted with the clinic than those offered a circumcision at 900MKW (Column 7). Again, including controls does not significantly change the magnitude or significance of the coefficients on price (Column 8). Note also that all of the results in Table 3 are robust to probit specifications (not shown).

There has been some discussion (as well as important ethical debates) about offering payments, for example a conditional cash transfer, to uncircumcised men to motivate them to get circumcised. Incentives may be one way to increase take-up by compensating men for costs associated with the surgery and recovery period. While our results on responses to prices are not informative for predicting
responses to “negative prices” or financial incentives, future research offering compensation in either cash or kind may be an important next step.

B. Information

One possible reason for low circumcision take-up even when the procedure was free is that men did not know or understand the medical benefits of male circumcision. Recall that at baseline only 49 percent of men believed correctly that circumcision was protective against HIV. At the follow-up, men who received the comprehensive information treatment were significantly more likely to update their beliefs that circumcision decreased the risk of HIV infection. Men who received the information also reported significantly lower perceived transmission rates as measured by levels and relative risk between circumcised and uncircumcised men (Appendix Table A).

Figure 3 graphs the impact of information on take-up. Receiving the comprehensive information about male circumcision significantly increased take-up; an effect between 1 and 1.8 percentage points (Table 4, Columns 1 through 4). We find no impact of information on take-up when we expand the definition of circumcised to include self-reported circumcisions at the partner clinic during the validity period, and we find no impact on having had any interaction with the partner clinic (Columns 5 through 8). Again, results are robust to probit specifications, although the size of the coefficient is smaller (not shown).

There is no significant impact of the information interacted with the price of the circumcision as illustrated by Figure 4, graphing circumcision take-up across price and information treatment group. However, we again caution that the small sample size of men who were circumcised limits our analyses.

24 This persistent effect from the information treatment is similar to that found in Godlonton et al. (2013) who randomized comprehensive information to a rural sample of men in Malawi and measured beliefs after one year. In contrast, beliefs about one’s own HIV status has been found to only persist in the short run (Thornton, 2012).
Baseline beliefs about the relationship between male circumcision and HIV infection may be important to consider when examining the impact of knowledge on take-up. Wilson et al. (2013) found that men who had different beliefs about male circumcision and HIV responded differentially after getting a circumcision in terms of their sexual behavior. Similarly, it may be possible that only those receiving new information may respond in this study. While baseline beliefs are correlated with take-up, there is no additional effect of the comprehensive information (not shown).

**C. Other Determinants – Non-Randomized Results**

Table 5 presents how baseline characteristics are correlated with the take-up of male circumcision and having any interaction with the clinic. It is important to note that these variables were not randomized at baseline and thus do not represent causal estimates. However, they can provide some insights into additional important factors for the demand for male circumcision.

One of the most important predictors of getting circumcised was openness to a circumcision defined as reporting willingness to be circumcised at the baseline. Those who reported being willing to circumcise at the baseline were between 2.6 and 3.1 percentage points more likely to receive a circumcision reported by the clinic, and almost 9 percentage points more likely to have had any interaction with the clinic.

There is no statistically significant effect of age on actual take-up, despite the large proportion of men who stated being “too old” was a reason to not get circumcised at baseline. This result should be viewed in the context of our sample, which only included men between age 18 and 35. Moreover, most men...
when stating they were “too old” were comparing themselves to the age that most Malawian boys are traditionally circumcised between eight and 18 years old.25

While opportunity cost may be an important factor for the decision to get circumcised, data on income or employment is unavailable. Total household expenditure – included in the regressions – is one proxy for these other variables. Expenditures are not associated with circumcision take-up. This is somewhat contradictory to the finding that take-up was so responsive to price, suggesting credit constraints may be important. One explanation may be that measurement error in expenditures biases the coefficient towards zero. Another possibility is that the immediate small costs are more important than the actual ability to pay. We have some evidence of this. Men who were circumcised at the partner clinic were asked what their perceived opportunity cost was of receiving the surgery (i.e., lost wages); on average they report 11,000MKW (approximately $73; not shown). Expanding the sample to men who reported getting circumcised anywhere (i.e., including self-reports) they report a loss of 14,720MKW ($98). In both cases, the median reported opportunity cost is 5,000MKW ($33). In contrast to these estimates, the voucher amounts are quite small.

Distance to the clinic was negatively associated with take-up, but not with having any interaction with the clinic. Having heard of someone getting a circumcision at the clinic is also significantly associated with getting circumcised or having any interaction at the clinic.

Those who have ever had an HIV test are 8.3 percentage points more likely to have any interaction at the clinic, potentially indicating selection on risk preferences. However, there is no relationship between prior HIV testing and actual circumcisions. Neither ex-ante beliefs of being infected nor these beliefs

25 In data collected by Godlonton, Munthali and Thornton (2013), the age at circumcision is reported to range from 8 (10th percentile) to 18 (90th percentile).
interacted with having a prior HIV test are significantly associated with getting a circumcision.

Lastly, we find that those who used a condom at last sex were significantly more likely to get circumcised – when the definition of circumcision is expanded to include self-reports. Our data are limited given the small take-up rate, but the extent of selection based on ex-ante risk would significantly affect the efficacy of male circumcision rollout and is important for future studies and programs to consider.

Why was the demand for medical male circumcision so low? We examine several possible explanations in the section below.

VI. Barriers to Take-up

Recall that at the baseline, men who reported they were unwilling to get circumcised were asked why they were unwilling (Figure 1). The most common answers were cultural or religious reason, fear of pain, being too old, or just not wanting to get a circumcision. To gain insight into the low overall take-up, we examine how offering the vouchers and the comprehensive information affected attitudes towards male circumcision.

Men at the follow-up – who had not gotten circumcised – were again asked whether or not they would be willing to be circumcised. Approximately 75 percent reported they would be willing to get circumcised, despite the fact that they had not yet gone for the surgery. Those who were unwilling were asked why they were unwilling and those who reported being willing were asked why they had not yet received a circumcision. Although there are some differences in responses to information and price across these two groups of men, these
differences are small and do not change the main results (not shown); we therefore pool these responses together.

Table 6 (and Appendix Table B) presents how information or price affects reported barriers to getting circumcised. There were no significant effects on reporting cultural or religious reasons, fear of pain, believing one is too old, or just simply not wanting to be circumcised. Importantly, these were the most commonly stated reasons for not getting circumcised at the baseline.

Prices had some effects on other reported barriers to circumcision. Those who were offered lower priced circumcisions were less likely to say expense was a barrier. They were also more likely to report being too busy. Information also had effects on barriers to male circumcision. Those receiving the comprehensive information were more likely to say they were not at risk, less likely to say they didn’t have enough information, and more likely to report that a family member objected to the surgery. In total, there was a small significant increase in the total number of reasons/barriers given among those who were given the comprehensive information.

Importantly, there was no impact of either information or price on expressing any positivity towards circumcision – as coded from the open-ended questions – or on the expressed willingness to be circumcised.

These results help to understand the low take-up in this study and why the information and price interventions were unable to substantially increase it. Although many men state they are willing to get circumcised, in actuality, providing comprehensive information about the benefit and providing free clinical circumcisions are not enough to reduce the main barriers that constitute over half of the stated reasons against circumcision.

It is important also to note that there may also have been administrative or logistical barriers to take-up. Because the vouchers were only valid for 3 months, men may have demanded a circumcision at a different time or season when the
opportunity costs were lower. Additionally, there were some reports that men were unable to schedule a time at the clinic when the clinician was available. This speaks to the importance of the need to promote both demand and ensure supply of male circumcision services. Among those men who made any contact with the clinic, they made an average of 2.25 calls to the clinic, 2.12 visits, and 1.9 attempts for surgery. Even among those who eventually got circumcised it took some effort; these men made 1.75 calls, 1.33 visits, and 2 surgery attempts.

VII. Conclusion

This paper measures the demand for medical male circumcision and the response to price and information using a randomized trial. No prior study, to our knowledge, has measured the demand for male circumcision. Overall, the demand was relatively low ranging from 2.6 to 8.9 percent using clinic and self-reported data respectively. This is particularly low when compared to the target of 80 percent set for male circumcision roll-out strategies.

Price was not the only barrier to receiving a male circumcision, but certainly was for some. In addition, information – while a significant factor – is not the main barrier to take-up. Openness to male circumcision – such as expressing willingness or having heard of someone who was circumcised at the clinic – appear to be important factors. However, the most common barriers to male circumcision – fear of pain and cultural or religious norms – are not affected by price or information. These findings should be considered in designing future demand generating interventions.

Our findings have important cost-implications for the efficacy of scaling up male circumcision. In particular, our findings of low demand imply fewer total infections averted and thus lower net savings from male circumcision service provision roll-out. Many sub-Saharan governments have set targets of circumcising 80 percent of their adult male population based off the cost-
effectiveness estimates in Njeuhmeli et al. (2011) which were calculated using the Decision-Makers’ Program Planning Tool (DMPPT) developed by USAID and UNAIDS. This model accounts for many key parameters such as demographic, epidemiological, and cost factors but does not take into account possible population-level spillovers from increased take-up. If spillovers are important for HIV incidence, cost-effectiveness estimates would underestimate the savings lost from low take-up and overestimate net cost-effectiveness of circumcision roll-out programs when there is lower demand. The relevant question for male circumcision roll-out is whether countries will reach the point where circumcision coverage reaches the necessary levels to incur the savings needed to justify this particular HIV prevention strategy over others.

Low demand could be particularly important if take-up is correlated to ex-ante risk or preferences. Our results suggest there may be some selection of those who are more likely to use condoms into circumcision. If men who are at lowest risk of HIV – those with the lowest marginal social benefit – are most likely to take-up circumcision, cost-effectiveness estimates could greatly overestimate the benefits of scale-up. Holding behavior constant, circumcising men with the highest marginal social benefit of the surgery first or at a faster rate maximizes the overall public health benefit of circumcision scale-up. Given the current low demand, male circumcision campaigns can be made more cost-effective if they target higher risk groups of the population such as in higher prevalence areas, or among truck drivers or the military.

Theoretically, this paper fits into a growing literature in economics on pricing of in health goods. Some argue that charging small fees might be optimal for increasing the use of products if those who value the good most are those who are most likely to pay for it (Kremer and Holla, 2009; Ashraf, Berry, and Shapiro, 2010; Cohen and Dupas, 2010; Cohen et al., 2012). A positive priced good might also signal that the product is of higher quality or effectiveness (Bagwell and
Riordan 1991; Riley 2001) or those who pay for a good may view the investment as a sunk cost and therefore be more likely to use it (Thaler 1980; Arkes and Blumer 1985). Despite these arguments a number of other experiments have found large responses to prices of health goods and benefits to offering products for free (Kremer and Miguel, 2007; Cohen and Dupas, 2009; Ashraf, Berry and Shapiro, 2010). In this study, we find no statistically significant difference in take-up between those offered a circumcision for free compared to those who were charged the smallest amount; however, we are limited by a lack of statistical power. Our finding of very low take-up even when the procedure was offered for free suggests large additional costs to getting circumcised. These costs may be psychological, or may be related to strong cultural or religious norms. In addition, in contrast to much of the existing literature estimating the willingness to pay for products offered during door-to-door campaigns, the willingness to pay for health products or services that need to be conducted at a health center may be substantially lower.

It is important to note that the results in this paper may not generalize to other Sub-Saharan African countries or to other service delivery models. However, providing male circumcision services in existing facilities is a common delivery model and has been suggested in many countries’ rollout plans. In addition, these results are among the very first adopters and the findings may not generalize to other contexts or latter in the adoption process. The results on the determinants of take-up are identified off of a small sample of men, suggesting caution in overgeneralizing the results. Lastly, our results are not informative for predicting responses to “negative prices” or financial incentives.

The findings in this paper do provide the first rigorous estimates of the demand for medical male circumcision and shed light on some of the real challenges for scaling up circumcision coverage to meet global targets. With the goal of reducing HIV infections, scaling up medical male circumcisions has become a
high priority. However, there must be joint efforts on both increasing demand particularly among high risk groups and ensuring reliable supply of quality services during scale-up. Reducing prices or providing information may be one way to reach targeted levels of male circumcision coverage, but clearly is not the only strategy needed. How to incentivize high risk adult men in endemic areas to get circumcised is an important question for future research.
References


Bengo, Joseph M., Kondwani Chalulu, Jobiba Chinkhumba, Lawrence Kazembe, Kenneth M. Maleta, Francis Masiye, and Don Mathanga. 2010.
“Situation Analysis of Male Circumcision in Malawi.” Blantyre, Malawi: University of Malawi College of Medicine.


http://econweb.umd.edu/~goldberg/docs/goldberg_ganyu.pdf


Figure 1: Reasons against circumcision

Sample: Men not willing to be circumcised at baseline

Notes: Sample includes 1634 men interviewed at baseline. Circumcision is measured by clinical records. Average rate was 2.6 percent.
Figure 2: Medical Male Circumcision and Price of Circumcision

Notes: Sample includes 1634 men interviewed at baseline. Circumcision is measured by clinical records. Average rate was 2.6 percent.
Figure 3: Medical Male Circumcision and Information

Notes: Sample includes 1634 men interviewed at baseline. Circumcision is measured by clinical records.

Notes: Sample includes 1634 men interviewed at baseline. Circumcision is measured by clinical records.
Figure 4: Medical Male Circumcision, Price and Information

Notes: Sample includes 1634 men interviewed at baseline. Circumcision is measured by clinical records.
Table 1: Sample Statistics - Full Sample

<table>
<thead>
<tr>
<th></th>
<th>Mean, SD</th>
<th>Information</th>
<th>Prices</th>
<th>Information</th>
<th>Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
</tr>
<tr>
<td>Age</td>
<td>26.686</td>
<td>0.739</td>
<td>0.777</td>
<td>0.198</td>
<td>0.250</td>
</tr>
<tr>
<td>Years of schooling</td>
<td>11.055</td>
<td>0.320</td>
<td>0.164</td>
<td>0.073</td>
<td>0.848</td>
</tr>
<tr>
<td>Expenditures</td>
<td>21,325.05</td>
<td>0.718</td>
<td>0.534</td>
<td>0.727</td>
<td>0.177</td>
</tr>
<tr>
<td>Circumcising tribe</td>
<td>0.171</td>
<td>0.717</td>
<td>0.784</td>
<td>0.199</td>
<td>0.465</td>
</tr>
<tr>
<td>Num sex acts last month</td>
<td>4.205</td>
<td>0.884</td>
<td>0.902</td>
<td>0.949</td>
<td>0.843</td>
</tr>
<tr>
<td>Multiple partners in past month</td>
<td>0.058</td>
<td>0.003</td>
<td>0.037</td>
<td>0.147</td>
<td>0.931</td>
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<tr>
<td>Abstinence last month</td>
<td>0.461</td>
<td>0.656</td>
<td>0.169</td>
<td>0.614</td>
<td>0.971</td>
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<td>Condom use at last sex</td>
<td>0.395</td>
<td>0.040</td>
<td>0.304</td>
<td>0.418</td>
<td>0.393</td>
</tr>
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<td>Belief of high likelihood HIV</td>
<td>0.217</td>
<td>0.959</td>
<td>0.699</td>
<td>0.598</td>
<td>0.256</td>
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<td>Ever had an HIV test</td>
<td>0.482</td>
<td>0.873</td>
<td>0.771</td>
<td>0.798</td>
<td>0.044</td>
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<tr>
<td>Willingness to circumcise</td>
<td>0.493</td>
<td>0.058</td>
<td>0.884</td>
<td>0.150</td>
<td>0.098</td>
</tr>
<tr>
<td>Circumcision is protective</td>
<td>0.488</td>
<td>0.207</td>
<td>0.978</td>
<td>0.338</td>
<td>0.587</td>
</tr>
<tr>
<td>Heard of anyone circumcised at clinic</td>
<td>0.196</td>
<td>0.046</td>
<td>0.491</td>
<td>0.218</td>
<td>0.113</td>
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<tr>
<td>Distance to the clinic (in km)</td>
<td>0.969</td>
<td>0.044</td>
<td>0.316</td>
<td>0.922</td>
<td>0.169</td>
</tr>
</tbody>
</table>

Notes: Sample consists of 1634 men who were interviewed at baseline. Expenditures categories were: Clothes, fabric, or shoes, Medical expenses at a clinic, doctor, pharmacy, or traditional doctor, Food: maize, meat, vegetables, eating out, transportation costs, and cell phone minutes. Median expenditures were 12,000 Kwacha. Believing circumcision is protective is generated from two questions that asked: i) “If 100 circumcised men each slept with a woman who is HIV positive last night, how many of them do you think would get HIV?”; and ii) “If 100 uncircumcised men each slept with a woman who is HIV positive last night, how many of them do you think would get HIV?”

Columns 2 and 3 present the p-values from separate regressions testing the difference in each baseline variable across the information treatment group (Column 2), or circumcision price (Column 3). Columns 4 and 5 present the p-values from separate regressions of being in the follow-up sample on each baseline variable interacted with information treatment indicator (Column 4) or an indicator of each price (Column 5). The p-values are either on the interaction of information and baseline variable, or the joint test of the interactions of each price and the baseline variable.
### Table 2: Voluntary Medical Male Circumcision Take-up

<table>
<thead>
<tr>
<th>Panel A: Full Sample (N=1634)</th>
<th></th>
<th>Number of Men</th>
<th>% of Full Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinic Data</td>
<td>Circumcised</td>
<td>43</td>
<td>0.0263</td>
</tr>
<tr>
<td>Panel B: Follow-up Sample (N=1252)</td>
<td></td>
<td>Number of Men</td>
<td>0.739</td>
</tr>
<tr>
<td>Clinic Data</td>
<td>Circumcised</td>
<td>41</td>
<td>0.033</td>
</tr>
<tr>
<td>Survey Data</td>
<td>Any interaction with the partner clinic about circumcision</td>
<td>326</td>
<td>0.260</td>
</tr>
<tr>
<td>Circumcised at non-partner clinic</td>
<td>25</td>
<td>0.020</td>
<td>0.225</td>
</tr>
<tr>
<td>Circumcised at partner clinic after validity period</td>
<td>9</td>
<td>0.007</td>
<td>0.081</td>
</tr>
<tr>
<td>Circumcised at partner clinic during validity period</td>
<td>36</td>
<td>0.029</td>
<td>0.324</td>
</tr>
<tr>
<td>Total (clinic or survey)</td>
<td>Circumcised</td>
<td>111</td>
<td>0.089</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Panel C: Validity Checks of Clinical Circumcisions (N=41)</th>
<th></th>
<th>Number of Men</th>
<th>% of Follow-up Sample</th>
<th>% of Clinic Records (N=41)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reports being circumcised at partner clinic</td>
<td>35</td>
<td>0.028</td>
<td>0.854</td>
<td></td>
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<tr>
<td>Reports not being circumcised</td>
<td>6</td>
<td>0.005</td>
<td>0.146</td>
<td></td>
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</table>

**Notes:**
- Panel A includes the full sample of men who were interviewed at the baseline. Panel B includes 1,252 men who were interviewed at both baseline and follow-up.
- Panel C includes the sample of 41 men who had clinic records and follow-up surveys. Interaction with the partner clinic includes a male circumcision, counseling, visits, or phone calls.
Table 3: Voluntary Medical Male Circumcision Take-Up and Price

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Circumcised (Clinic)</th>
<th>Circumcised (Self-Report: Valid Clinic + Non-expired Clinic)</th>
<th>Any clinic interaction (Self-Report)</th>
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<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Free</td>
<td>0.031***</td>
<td>0.026**</td>
<td>0.036***</td>
</tr>
<tr>
<td></td>
<td>[0.012]</td>
<td>[0.011]</td>
<td>[0.013]</td>
</tr>
<tr>
<td>50 MKW</td>
<td>0.041***</td>
<td>0.038***</td>
<td>0.053***</td>
</tr>
<tr>
<td></td>
<td>[0.010]</td>
<td>[0.010]</td>
<td>[0.013]</td>
</tr>
<tr>
<td>100 MKW</td>
<td>0.032**</td>
<td>0.026*</td>
<td>0.035**</td>
</tr>
<tr>
<td></td>
<td>[0.014]</td>
<td>[0.013]</td>
<td>[0.017]</td>
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<tr>
<td>200 MKW</td>
<td>0.023**</td>
<td>0.023**</td>
<td>0.031**</td>
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<tr>
<td></td>
<td>[0.010]</td>
<td>[0.010]</td>
<td>[0.013]</td>
</tr>
<tr>
<td>500 MKW</td>
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<td>0.006</td>
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<tr>
<td></td>
<td>[0.007]</td>
<td>[0.008]</td>
<td>[0.009]</td>
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<tr>
<td>Observations</td>
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<td>1,634</td>
<td>1,252</td>
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<td>R-squared</td>
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<td>0.034</td>
<td>0.009</td>
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<tr>
<td>Incl. controls?</td>
<td>N</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Ave of dep variable (900 MKW)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.008</td>
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</table>

Notes:
Robust standard errors clustered by block and interview date. Control variables include: age, age squared, logged total expenditures, years of schooling, whether the respondent is of a circumcising tribe, whether the respondent reported he was willing to be circumcised, if the respondent thought his risk of having HIV was high, if the respondent ever had an HIV test, the interaction of belief of high risk and having an HIV test, if the respondent had heard of anyone who circumcised at the partner clinic, if the respondent correctly believed that circumcision was associated with lower risk of HIV, distance to the clinic, number of sex acts in the last month, and indicators for whether the respondent used a condom at last sex, abstinence in the last month, and multiple concurrent partnerships. We also include an indicator of whether the respondent was allocated to the information treatment. For covariates with missing values, the median has been imputed, and a dummy included for whether or not the covariate is missing included. * significant at 10%; ** significant at 5%; *** significant at 1%. Interaction with the partner clinic includes male circumcision, counseling, visits, or phone calls.
<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Circumcised (Clinic)</th>
<th>Circumcised (Clinic)</th>
<th>Circumcised (Self-Report: Valid Clinic + Non-expired Clinic)</th>
<th>Any clinic interaction (Self-Report)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full Sample</td>
<td>Follow-up Sample</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information</td>
<td>0.010</td>
<td>0.014**</td>
<td>-0.004</td>
<td>-0.005</td>
</tr>
<tr>
<td></td>
<td>[0.007]</td>
<td>[0.007]</td>
<td>[0.011]</td>
<td>[0.026]</td>
</tr>
<tr>
<td>Observations</td>
<td>1,634</td>
<td>1,634</td>
<td>1,252</td>
<td>1,252</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.001</td>
<td>0.034</td>
<td>0.001</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.040</td>
<td>0.049</td>
<td>0.067</td>
</tr>
<tr>
<td>Incl. controls?</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Ave of dep variable (No info)</td>
<td>0.021</td>
<td>0.026</td>
<td>0.059</td>
<td>0.263</td>
</tr>
</tbody>
</table>

Notes:
Robust standard errors clustered by block and interview date. Control variables include: age, age squared, logged total expenditures, years of schooling, whether the respondent is of a circumcising tribe, whether the respondent reported he was willing to be circumcised, if the respondent thought his risk of having HIV was high, if the respondent ever had an HIV test, the interaction of belief of high risk and having an HIV test, if the respondent had heard of anyone who circumcised at the partner clinic, if the respondent correctly believed that circumcision was associated with lower risk of HIV, distance to the clinic, number of sex acts in the last month, and indicators for whether the respondent used a condom at last sex, abstinence in the last month, and multiple concurrent partnerships. We also include circumcision price indicators. For covariates with missing values, the median has been imputed, and a dummy included for whether or not the covariate is missing included. * significant at 10%; ** significant at 5%; *** significant at 1%. Interaction with the partner clinic includes male circumcision, counseling, visits, or phone calls.
## Table 5: Determinants of Take-Up

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Circumcised (Clinic)</th>
<th>Circumcised (Self-Report: Valid Clinic + Non-expired Clinic)</th>
<th>Any clinic interaction (Self report)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full Sample</td>
<td>Follow-up Sample</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.002 [-0.002]</td>
<td>-0.000 [0.000]</td>
<td>-0.016** [0.007]</td>
</tr>
<tr>
<td>Age squared</td>
<td>0.000 [0.000]</td>
<td>-0.000 [0.000]</td>
<td>0.000*** [0.000]</td>
</tr>
<tr>
<td>Years of education</td>
<td>-0.001 [-0.001]</td>
<td>-0.000 [0.000]</td>
<td>-0.004 [0.005]</td>
</tr>
<tr>
<td>Log expenditures</td>
<td>0.001 [0.000]</td>
<td>0.003 [0.007]</td>
<td>0.014 [0.011]</td>
</tr>
<tr>
<td>Circumcising tribe</td>
<td>0.012 [0.012]</td>
<td>0.020 [0.018]</td>
<td>0.010 [0.028]</td>
</tr>
<tr>
<td>Distance from clinic</td>
<td>-0.018* [-0.022*]</td>
<td>-0.006 [0.011]</td>
<td>0.000 [0.050]</td>
</tr>
<tr>
<td># sex acts in last month</td>
<td>-0.001 [-0.001]</td>
<td>-0.000 [0.000]</td>
<td>0.000 [0.002]</td>
</tr>
<tr>
<td>Multiple partners indicator</td>
<td>0.032 [0.025]</td>
<td>0.029 [0.045]</td>
<td>-0.040 [0.060]</td>
</tr>
<tr>
<td>Abstained in last month</td>
<td>-0.011 [-0.008]</td>
<td>0.011 [0.018]</td>
<td>0.023 [0.037]</td>
</tr>
<tr>
<td>Used condom at last sex</td>
<td>0.007 [0.008]</td>
<td>0.011 [0.015]</td>
<td>0.031 [0.026]</td>
</tr>
<tr>
<td>High likelihood HIV+ now</td>
<td>-0.007 [-0.0013]</td>
<td>0.001 [0.001]</td>
<td>0.001 [0.002]</td>
</tr>
<tr>
<td>Had HIV test</td>
<td>-0.004 [-0.003]</td>
<td>0.015 [0.015]</td>
<td>0.083*** [0.022]</td>
</tr>
<tr>
<td>High likelihood * HIV test</td>
<td>0.017 [0.020]</td>
<td>-0.033 [0.028]</td>
<td>-0.089 [0.062]</td>
</tr>
<tr>
<td>Willingness to circumcise</td>
<td>0.026*** [0.009]</td>
<td>0.031** [0.012]</td>
<td>0.033** [0.014]</td>
</tr>
<tr>
<td>Correct beliefs about MC</td>
<td>0.001 [0.009]</td>
<td>0.020 [0.013]</td>
<td>-0.008 [0.025]</td>
</tr>
<tr>
<td>Heard of MC at clinic</td>
<td>0.021** [0.010]</td>
<td>0.032 [0.022]</td>
<td>0.163*** [0.031]</td>
</tr>
<tr>
<td>Observations</td>
<td>1,634 1,252</td>
<td>1,252 1,252</td>
<td>1,252 1,252</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.034 0.040</td>
<td>0.041 0.067</td>
<td></td>
</tr>
<tr>
<td>Incl. price and information indicators?</td>
<td>Y Y Y Y</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
Robust standard errors clustered by block and interview date. Also includes circumcision price indicators and an information treatment indicator. For covariates with missing values, the median has been imputed, and a dummy included for whether or not the covariate is missing included. * significant at 10%; ** significant at 5%; *** significant at 1%. Interaction with the partner clinic includes male circumcision, counseling, visits, or phone calls.
Table 6: Attitudes towards Circumcision

<table>
<thead>
<tr>
<th>Dependent Variable: Barrier to circumcision due to -</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td>0.035</td>
<td>0.009</td>
<td>0.018*</td>
<td>-0.043*</td>
<td>0.023***</td>
<td>-0.044*</td>
<td>0.042***</td>
<td>0.057*</td>
</tr>
<tr>
<td></td>
<td>[0.031]</td>
<td>[0.025]</td>
<td>[0.010]</td>
<td>[0.023]</td>
<td>[0.008]</td>
<td>[0.026]</td>
<td>[0.015]</td>
<td>[0.034]</td>
</tr>
<tr>
<td>Free</td>
<td>-0.052</td>
<td>-0.035</td>
<td>-0.066**</td>
<td>0.092**</td>
<td>-0.004</td>
<td>-0.024</td>
<td>-0.020</td>
<td>-0.099***</td>
</tr>
<tr>
<td></td>
<td>[0.053]</td>
<td>[0.039]</td>
<td>[0.032]</td>
<td>[0.039]</td>
<td>[0.020]</td>
<td>[0.042]</td>
<td>[0.031]</td>
<td>[0.036]</td>
</tr>
<tr>
<td>50 MKW</td>
<td>0.004</td>
<td>-0.031</td>
<td>-0.051</td>
<td>0.068</td>
<td>-0.009</td>
<td>-0.005</td>
<td>-0.003</td>
<td>-0.022</td>
</tr>
<tr>
<td></td>
<td>[0.055]</td>
<td>[0.034]</td>
<td>[0.040]</td>
<td>[0.050]</td>
<td>[0.020]</td>
<td>[0.048]</td>
<td>[0.028]</td>
<td>[0.048]</td>
</tr>
<tr>
<td>100 MKW</td>
<td>-0.027</td>
<td>-0.013</td>
<td>-0.051</td>
<td>0.072</td>
<td>-0.009</td>
<td>0.003</td>
<td>-0.027</td>
<td>-0.060</td>
</tr>
<tr>
<td></td>
<td>[0.068]</td>
<td>[0.045]</td>
<td>[0.037]</td>
<td>[0.045]</td>
<td>[0.019]</td>
<td>[0.048]</td>
<td>[0.035]</td>
<td>[0.050]</td>
</tr>
<tr>
<td>200 MKW</td>
<td>-0.047</td>
<td>-0.034</td>
<td>-0.039</td>
<td>0.095***</td>
<td>-0.024</td>
<td>-0.014</td>
<td>0.001</td>
<td>-0.089*</td>
</tr>
<tr>
<td></td>
<td>[0.055]</td>
<td>[0.047]</td>
<td>[0.043]</td>
<td>[0.035]</td>
<td>[0.018]</td>
<td>[0.055]</td>
<td>[0.036]</td>
<td>[0.054]</td>
</tr>
<tr>
<td>500 MKW</td>
<td>-0.009</td>
<td>-0.060</td>
<td>-0.049</td>
<td>0.051</td>
<td>0.026</td>
<td>-0.015</td>
<td>0.038</td>
<td>-0.027</td>
</tr>
<tr>
<td></td>
<td>[0.057]</td>
<td>[0.047]</td>
<td>[0.040]</td>
<td>[0.045]</td>
<td>[0.030]</td>
<td>[0.048]</td>
<td>[0.039]</td>
<td>[0.045]</td>
</tr>
<tr>
<td>Observations</td>
<td>1.072</td>
<td>1.072</td>
<td>1.072</td>
<td>1.072</td>
<td>1.072</td>
<td>1.072</td>
<td>1.072</td>
<td>1.072</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.054</td>
<td>0.023</td>
<td>0.055</td>
<td>0.038</td>
<td>0.051</td>
<td>0.032</td>
<td>0.039</td>
<td>0.046</td>
</tr>
<tr>
<td>Incl. controls?</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Ave of dep variable</td>
<td>0.271</td>
<td>0.146</td>
<td>0.046</td>
<td>0.170</td>
<td>0.019</td>
<td>0.230</td>
<td>0.088</td>
<td>1.130</td>
</tr>
</tbody>
</table>

Notes: Robust standard errors clustered by block. Control variables include: age, age squared, logged total expenditures, years of schooling, whether the respondent is of a circumcising tribe, whether the respondent reported he was willing to be circumcised, if the respondent thought his risk of having HIV was high, if the respondent ever had an HIV test, the interaction of belief of high risk and having an HIV test, if the respondent had heard of anyone who circumcised at the partner clinic, if the respondent correctly believed that circumcision was associated with lower risk of HIV, distance to the clinic, and indicators of being low risk and high risk. We also include circumcision price indicators and an information treatment indicator. For covariates with missing values, the median has been imputed, and a dummy included for whether or not the covariate is missing included. * significant at 10%; ** significant at 5%; *** significant at 1%.
<table>
<thead>
<tr>
<th>Believes circumcision is related to:</th>
<th>Perceived HIV transmission rate:</th>
<th>Relative risk (as measured by perceived HIV transmission rates):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased HIV risk</td>
<td>Decreased HIV risk</td>
<td>No impact on HIV risk</td>
</tr>
<tr>
<td>Information</td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Information</td>
<td>-0.007</td>
<td>0.038*</td>
</tr>
<tr>
<td>[0.005]</td>
<td>[0.023]</td>
<td>[0.021]</td>
</tr>
<tr>
<td>Constant</td>
<td>0.010**</td>
<td>0.830***</td>
</tr>
<tr>
<td>[0.004]</td>
<td>[0.012]</td>
<td>[0.012]</td>
</tr>
<tr>
<td>Observations</td>
<td>1,248</td>
<td>1,248</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.002</td>
<td>0.003</td>
</tr>
<tr>
<td>Incl. controls?</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

**Notes:**
Follow-up sample. Robust standard errors clustered by block and interview date. No baseline controls included.
* significant at 10%; ** significant at 5%; *** significant at 1%
### Appendix Table B: Attitudes towards Circumcision

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Barrier to circumcision due to -</th>
<th>Positive about</th>
<th>Willing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Too old</td>
<td>Just don't want</td>
<td>MC</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Information</td>
<td>0.005</td>
<td>0.015</td>
<td>0.018</td>
</tr>
<tr>
<td></td>
<td>[0.015]</td>
<td>[0.015]</td>
<td>[0.015]</td>
</tr>
<tr>
<td>Free</td>
<td>-0.018</td>
<td>-0.023</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>[0.022]</td>
<td>[0.032]</td>
<td>[0.025]</td>
</tr>
<tr>
<td>50 MKW</td>
<td>-0.007</td>
<td>-0.021</td>
<td>0.034</td>
</tr>
<tr>
<td></td>
<td>[0.027]</td>
<td>[0.029]</td>
<td>[0.025]</td>
</tr>
<tr>
<td>100 MKW</td>
<td>-0.031*</td>
<td>-0.020</td>
<td>0.029</td>
</tr>
<tr>
<td></td>
<td>[0.018]</td>
<td>[0.035]</td>
<td>[0.030]</td>
</tr>
<tr>
<td>200 MKW</td>
<td>-0.018</td>
<td>-0.012</td>
<td>-0.006</td>
</tr>
<tr>
<td></td>
<td>[0.027]</td>
<td>[0.033]</td>
<td>[0.025]</td>
</tr>
<tr>
<td>500 MKW</td>
<td>0.006</td>
<td>-0.038</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>[0.021]</td>
<td>[0.034]</td>
<td>[0.023]</td>
</tr>
<tr>
<td>Observations</td>
<td>1,072</td>
<td>1,072</td>
<td>1,072</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.032</td>
<td>0.047</td>
<td>0.032</td>
</tr>
<tr>
<td>Incl. controls?</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Ave of dep variable</td>
<td>0.049</td>
<td>0.062</td>
<td>0.083</td>
</tr>
</tbody>
</table>

**Notes:**
Robust standard errors clustered by block. Control variables include: age, age squared, logged total expenditures, years of schooling, whether the respondent is of a circumcising tribe, whether the respondent reported he was willing to be circumcised, if the respondent thought his risk of having HIV was high, if the respondent ever had an HIV test, the interaction of belief of high risk and having an HIV test, if the respondent had heard of anyone who circumcised at the partner clinic, if the respondent correctly believed that circumcision was associated with lower risk of HIV, distance to the clinic, and indicators of being low risk and high risk. We also include circumcision price indicators and an information treatment indicator. For covariates with missing values, the median has been imputed, and a dummy included for whether or not the covariate is missing included. * significant at 10%; ** significant at 5%; *** significant at 1%.
Contemplating Circumcision:
The Influence of Social Networks on Decision-Making

Rachael S. Pierotti, The World Bank
Rebecca L. Thornton, University of Michigan

Abstract: This paper presents results from analysis of 64 in-depth interviews with urban men embedded in an experimental quantitative study of demand for medical male circumcision for HIV prevention in Malawi. Despite having expressed genuine interest in circumcision, few study participants (three percent) opted to actually undergo the surgery. The qualitative interviews shed light on the gap between favorable attitudes and actions, demonstrating that a crucial element of the decision-making process is consultation with social networks. Social networks can be a source of scary rumors about circumcisions gone wrong. At the same time, men also receive support and encouragement to undergo the surgery. Feedback from social networks additionally influences how men deal with structural barriers to obtaining a circumcision, such as costs associated with the surgery and healing period. In these ways, reactions from peers affect decisions regarding uptake of circumcision. Another implication of these findings is that this consultation process takes time. Attention to the role of social networks in the adoption of medical male circumcision and allowing for the time needed for consultation is crucial for the success of male circumcision scale-up for HIV prevention.

Key words: Malawi, Africa, male circumcision, social networks, HIV, mixed methods

Acknowledgements: Funding for this study was provided by 3ie. The authors gratefully acknowledge use of the services and facilities of the Population Studies Center at the University of Michigan, funded by NICHD Center Grant R24 HD041028. One of the authors was supported by the National Science Foundation Graduate Research Fellowship [Grant No. DGE 0718128]. We are grateful for the hard work and cooperation of our partner clinic and especially Brendan Hayes. We acknowledge the extensive contributions of the field team as well as Jobiba Chinkhumba, Susan Godlonton, Ernest Mlenga and Justin Schon. We also thank the Developmental Idealism Studies Project at the University of Michigan Population Studies Center.
1 Introduction

Recent studies showing that medical male circumcision lowers the risk of HIV transmission by up to 60 percent (Auvert et al., 2005; Bailey et al., 2007; Gray et al., 2007; Gray et al., 2012) resulted in a call for scale-up of circumcision in high HIV prevalence countries in Eastern and Southern Africa (WHO & UNAIDS, 2011a). Malawi, the location of this study, is a priority country for the provision of male circumcision services because of the estimated adult HIV prevalence rate of 11 percent and because the majority (78 percent) of adult men are not circumcised (NSO [Malawi] and ICF Macro, 2011). In Malawi, as elsewhere in sub-Saharan Africa, until the recent medical trials, the main reasons for getting a circumcision were religious or cultural; most of the men who are currently circumcised belong to traditionally circumcising ethnic groups and/or identify as Muslim.

There are reasons to be optimistic about the prospects for success of widespread circumcision campaigns. Acceptability studies find that the majority of uncircumcised men (65 percent across 13 countries) express hypothetical willingness to get circumcised (Westercamp & Bailey, 2007). In Malawi, Ngalande, Levy, Kapondo, and Bailey (2006) conducted focus group discussions among men and women and found that male circumcision was “generally acceptable” and many respondents reported that they would welcome the provision of male circumcision services. In a nationwide survey conducted in Malawi in 2010, Bengo et al. (2010) found that 37 percent of uncircumcised men reported being hypothetically willing to be circumcised.

Despite the high levels of reported interest, the number of medical circumcisions being performed in Malawi is quite low. Between 2008 and 2011, an estimated 3,119 medical male circumcisions were performed, only 0.1 percent of the target (WHO & UNAIDS, 2011b).
However, from these data alone it is difficult to determine whether the uptake of adult medical male circumcision is low due to a lack of demand, or because of the limited supply of services. Circumcision services are not currently easily available in Malawi and the government did not outline a national policy for the promotion of circumcision until October 2011 (PlusNews 2012).

This study builds on research on the hypothetical acceptability of adult male circumcision by examining actual demand for circumcision among men offered an opportunity to undergo the surgery. In 2010, an acceptability study was conducted in an urban setting in Malawi among approximately 1,600 uncircumcised men. Roughly 50 percent of the respondents indicated hypothetical willingness for a circumcision, but only 3 percent of the men in the study were actually circumcised at the study’s partner clinic within one year of their baseline interview (Chinkhumba, Godlonton, & Thornton, 2012). To identify reasons for the gap between the attitudes and actions of men considering circumcision, we analyze the decision making process described in 64 in-depth interviews with study participants.

This paper is the first to our knowledge that combines quantitative data on actual circumcisions with qualitative data on actual decision-making, rather than hypothetical willingness to perform hypothetical actions. This is an important distinction because while hypothetical willingness questions can capture attitudes, they do not perfectly predict actions (Westercamp & Bailey, 2007). Using in-depth interviews embedded within a survey experiment, we were able to examine the decision-making process that mediated between attitudes and actions regarding circumcision.

**Theoretical framework**

The theory of reasoned action and the theory of planned behavior provide a useful model for understanding the gap between hypothetical willingness and actual behavior (Fishbein &
Ajzen, 2010; Ajzen, 1988; Fishbein & Ajzen, 1975). A simplified version of the model is reproduced in Figure 1 (taken from Fishbein & Ajzen, 2010:22). In this model, whether or not an individual performs a given behavior is determined most immediately by his/her behavioral intention (Box D) and external factors that determine the individual’s ability to achieve his/her behavioral goal (Box E). Hypothetical willingness questions are often interpreted as indicators of behavioral intentions (Fishbein & Ajzen, 2010:40-43). As such, identifying a gap between willingness and behavior suggests that structural barriers are the major impediment to action and, therefore, implies that supply-side interventions are the best policy response.

[Figure 1 about here.]

In contrast, data from this study indicate that hypothetical willingness questions measured a respondent’s attitude (Box A) about circumcision, an indicator of underlying positive or negative disposition toward the behavior. And, in keeping with the model, study participants needed to assess social norms (Box B) and their control in the face of structural constraints (Box C) before determining their behavioral intentions. Results of the in-depth interviews indicated that respondents relied on their social networks for this decision-making process. They engaged with their family, sexual partners, and most of all their peers to gather information about the circumcision procedure itself, and to collectively evaluate the value of medical male circumcision. Additionally, feedback from friends and family influenced how respondents perceived and dealt with structural barriers to obtaining a circumcision, such as the costs associated with the surgery and healing period. Social networks provided critical input to this decision-making process that ultimately led to the formation of behavioral intentions.

This process of consulting with peers had several consequences. First, the results of consultation depended on the knowledge, attitudes, and experiences of social network members.
While many received encouragement from their peers to undergo the surgery, social networks were also often a source of stories about circumcision gone wrong. Information provided by peers who had undergone a medical circumcision at a clinic was especially valued, although a majority of respondents did not know someone with that experience. Second, the desire for consultation with social networks meant that even respondents with positive attitudes about medical circumcision needed time to determine their behavioral intentions.

These findings have important implications for both academic researchers and policy makers. First, researchers assessing demand for circumcision should note that an expression of hypothetical willingness should not be immediately interpreted as a behavioral intention. Second, policy makers seeking to address a gap between expressed interest in circumcision and uptake of the practice must emphasize demand creation within social networks in addition to addressing structural barriers. Finally, both researchers and policy makers should be cognizant that in the case of new or unfamiliar interventions, such as male circumcision in this setting, decision-makers need time to consult their networks and form their own behavioral intentions. Future studies and interventions must allow sufficient time for target populations to consult with social networks during their decision-making process.

The paper proceeds as follows: Section 2 describes the data and methods. Section 3 provides information on the study setting and the qualitative sample. Section 4 presents results from the interviews. Finally, Section 5 discusses the findings in relation to future efforts to scale-up medical male circumcision in Malawi and beyond.
2 Data and Methods

The data for this paper come primarily from qualitative in-depth interviews with 64 men ages 18-35, which were conducted as part of a larger quantitative survey experiment. The quantitative survey is described first below, followed by a description of the qualitative data collection.

Quantitative Survey

The quantitative survey consisted of two waves of data collected among a randomly selected sample of men living in Lilongwe, Malawi’s capital city. Approximately 1,600 uncircumcised men were interviewed in March 2010. The representative sample was drawn from the catchment area of a small private clinic that partnered with the research team to offer male circumcision services. Approximately one year later, in June 2011, the study team attempted to re-contact all respondents for a follow-up survey and achieved a response rate of approximately 77 percent (Chinkhumba, Godlonton, & Thornton, 2012). The quantitative study included two interventions that were randomly assigned at the end of the baseline interview—vouchers of varying amounts (including free) for male circumcision at the local partner clinic, and in-depth information about male circumcision and HIV randomly given to half of the respondents.

Qualitative Interviews

In-depth interviews were conducted shortly after the quantitative follow-up survey. Participants in the in-depth qualitative interviews were randomly selected from respondents in the quantitative study, stratified on the treatment arms and follow-up circumcision status. If the study team was unable to contact one of the respondents selected for an interview, after three attempts he was removed from the qualitative sample and replaced with another randomly selected respondent from the same group. The overall response rate for the in-depth interviews
was 90 percent; 45 percent of the qualitative sample had been circumcised in the year after the baseline.

The semi-structured interviews lasted between 45 minutes and 3 hours, and were conducted in Chichewa by male Malawian interviewers. The interview guide contained open-ended questions on knowledge and opinions of male circumcision and factors considered when deciding whether or not to get circumcised. Interview guide translation from English to Chichewa was done as part of the interviewer training, which facilitated discussion of the interview goals. Four interviewers were retained at the end of the training and piloting period.

Before each interview, respondents were informed of their rights as research participants and gave written informed consent. With additional consent, a digital audio recorder was used to record the interview. All respondents were offered 250 mobile phone airtime units (approximate value of $1.67) at the end of the survey to thank them for their participation. Ethics board approvals for this study were obtained from the University of Michigan and COMREC, at the University of Malawi College of Medicine.

After completion, the interviews were transcribed into English and each transcript was read to identify common themes in respondents’ decision-making processes. The common themes were then used as initial codes and all transcripts were coded using HyperResearch. After detailed coding, the transcripts were read a third time and macro codes indicating the respondent’s level of interest in circumcision were assigned based on a holistic assessment of the interview. Finally, to examine the reliability of the coding, a research assistant who had not been involved in the data collection effort also read and assigned macro codes to each interview transcript. Any differences in coding were deliberated and final coding was determined based on a collaborative review of the transcript. All the names used in this paper are pseudonyms to
protect the identity of the respondents. We next turn to describing the setting and sample characteristics.

3 Setting and Sample Characteristics

The setting for this study was a low and middle-income neighborhood, centrally located within Lilongwe. Table 1 presents summary statistics of the qualitative sample, which were collected during the baseline survey in 2010. The mean age of the sample was approximately 25 years old and respondents had completed an average of more than 11 years of school. The sample was ethnically diverse, although it contained almost no Yao participants since only respondents who were uncircumcised at baseline were eligible to participate in the quantitative survey. Similarly, all respondents were Christian, since nearly all Muslims in the area were already circumcised and were thus ineligible. Interview participants spent a median amount of $120 per month on clothes, medical expenses, food, transportation, and mobile phone airtime. Overall, respondents included in the sample were wealthier and better educated than the average Malawian citizen, as expected in this urban setting.

[Table 1 about here.]

Nearly 90 percent of the interview participants had ever had sex in their lifetime, with an average number of about 2 sexual partners in the year prior to the baseline survey. Among the participants, 48 percent had ever been tested for HIV. Before any information was provided by the research team, almost 60 percent of interview participants reported that circumcised men have a lower risk of contracting HIV than uncircumcised men. Approximately 27 percent had
heard of someone getting circumcised at the study’s partner clinic. Importantly, 60 percent reported that they would be willing to get circumcised.

4 Results

The analysis of decision-making processes described in the following sections was motivated by the observed gap between respondents’ attitudes and their actual behaviors regarding circumcision. Detailed findings are reviewed in the following four sub-sections: (1) attitudes about circumcision, (2) the role of social networks in the (re)construction of social norms regarding circumcision, (3) the effect of social networks on perceived control over the circumcision decision, and finally, (4) the need for time to conduct social network consultation before forming behavioral intentions.

**Attitudes toward circumcision**

Before proceeding to an examination of the gap between attitudes and actual behavior, it is important to consider the attitudes themselves. Rather than capturing true positive feelings toward male circumcision, the influence of social desirability may have encouraged survey respondents to overstate their willingness to get circumcised. To assess this possibility we reviewed attitudes about circumcision expressed in the in-depth interviews.

Of the 35 interview participants who had not gotten circumcised, 16 respondents expressed either no interest or outright opposition to the practice. They explained that circumcision was irrelevant in their lives. For example, Joseph said, “I don’t even desire to do it in any way even though it is good and I know its advantage. But for me to go and get it, no, I don’t do that.” He explained that circumcision is fine for younger people, but at his “old” age
(Joseph is 30), he felt that circumcision would be too painful and he was not interested. Respondents like Joseph made it clear that regardless of any potential benefits, they did not believe that circumcision was for them. They were unlikely to become circumcised in the near future, regardless of their circumstances or the design of potential interventions that addressed structural barriers to adoption. Their answers were in stark contrast to the decision-making processes described by 19 respondents (54 percent) who were more open to circumcision.

Men who did not get circumcised but were coded as having interest in circumcision explicitly expressed a desire for the surgery, despite the availability of other HIV prevention methods. For many of them, male circumcision was regarded as a partial solution to two main issues with other prevention strategies: limitations of condoms and lack of trust in partners.

As found in other studies on HIV prevention (e.g. Tavory and Swidler 2009; Hirsch et al. 2009), many of our respondents felt that condoms were not always desirable, available, or appropriate. Peter described a general dislike of condoms, which is common in Malawi, saying, “A lot of young men hate using condoms because they do not feel anything.” Similarly, Watkins, (2004) found a dislike for condoms because they destroyed the “sweetness” and the pleasure of sex. Availability of condoms was also noted as a problem. Several men gave examples of situations where unprotected sex occurred because condoms were not available or were forgotten. Christopher, who was circumcised between the baseline and follow-up surveys, said, “one may use protection against STIs, but you may not always be ready to do that [use a condom]. You may want to have sex when you do not have condoms.” Lastly, condom use in marriage was often seen as inappropriate because it implied a lack of trust between partners. Emmanuel explained, “Condom use is also a better method [of protection], but people who are married see it as a problem. This is the case because if you are using that, it's like you are still
untrusting each other.” In sum, condoms were not seen as a universal solution to the need for HIV prevention because they were not always desirable, available, or appropriate.

Given the limitations of condoms, the lack of trust in a partner’s fidelity became an important theme for why some viewed circumcision as a good option for extra protection against infection. In part, circumcision was attractive because it did not rely on the cooperation of a partner. Daniel, who got circumcised, clearly summarized this point, “Ah, trusting one another on issues of health? It's like every one of us stays separate from the other. I cannot know the way she is conducting herself there and me here. We are people who when we meet, we chat, and then everybody goes to her home. But on the issue of health, these days it is everybody takes care of their own affairs; you take care of yourself on issues of health.” In the quantitative baseline survey, only 30 percent of men in the full sample reported that they believed their primary partner had been faithful to them. This lack of trust meant that being faithful to one partner was not widely valued as an effective prevention method.

Beliefs about the limitations of condoms, and the risk from partner infidelity, contributed to generally positive attitudes about circumcision among this group of men. We next provide insight into the decision-making process, which helps to explain the gap between these positive attitudes and actions.

Social networks and social norms

One of the most important themes in the interviews was that even respondents who had positive attitudes about circumcision still consulted with their social networks to inform their behavioral intentions towards the surgery. Some respondents discussed circumcision with their families or sexual partners, but information from peers was most important. Victor described the
kinds of discussions he had with his friends about circumcision: “The first time I had this discussion with my friends it was like we were giving each other ideas. One would ask a friend whether they would want to get circumcised or not and then reasons were being given. Some would say that they would never get circumcised and others would say that they could go.” In these discussions, men collectively evaluated the meaning and value of male circumcision.

Depending on who men consulted to assess norms about the practice, social network exchanges resulted in varying levels of discouragement or encouragement to seek circumcision. Discouragement from social networks often came in the form of stories of circumcisions gone wrong. Many respondents described vivid rumors of worst-case scenarios. The rumors, passed through the social networks of young men, usually described disfiguration or amputation of the penis, and invoked fears of diminished masculinity. Zachariah explained, “My only fears concerned the outcome of poor surgery, which would consequently lead to one being disabled and that would compel the surgeons to completely cut the whole thing off.” Edward had a similar fear: “it happens that after they have circumcised you it [the penis] swells. So, it is found that you get destroyed; the entire sex organ gets destroyed.” Jonah, who was so afraid that he was coded as having no interest in circumcision, put it plainly during his interview. He pointed at his penis and said, “You know, this is life.” These scary stories implicitly conveyed a normative opposition to circumcision. They stressed the cultural significance of men’s virility and suggested that, regardless of potential benefits, circumcision was not worth the risk. Moreover, these statements suggested that the decision to get circumcised was not based simply on rational calculations; emotions played an important role. Fear discouraged many men from any further consideration of circumcision despite acknowledgement that fears were often based on
unfounded rumors. Emotional reactions to scary rumors were an especially powerful influence on men without access to countervailing information and normative pressures.

The most compelling encouragement provided through social network exchange came from men with first-hand experience of getting circumcised at a clinic. First-hand information was especially convincing because it provided inspiration in the form of both injunctive norms—what one ought to do—and descriptive norms—what others are doing (Fishbein & Ajzen, 2010). These interactions with others who had undergone the surgery helped to dispel some of the fears described above. For example, Andrew sought information from men at his work at the taxi rank (taxi stand) who had gotten circumcised as adults. Hearing their experiences helped him to disregard the rumors he had heard elsewhere. He explained that while considering the horror stories relayed by his friends, he remembered, “three quarters of the men at [the taxi] rank also got circumcised, and they would be saying that such such a person has been circumcised and such such a person has been circumcised. So I said if they did not die, why should I be the first person to die? So I said no, I will go and I will get circumcised.” For him, having personal connections with several men who had been circumcised as adults convinced him that it was safe and advisable to get circumcised.

Similarly, encouragement from friends convinced Victor to get circumcised: “I consulted my friends. So it looked like 70 percent of the friends I consulted had all been circumcised, so they convinced me by telling me that there was nothing to be afraid of and that it was good.” For these respondents and others like them, knowing someone who had been circumcised at a clinic enabled them to overcome their fears and provided normative support for a decision to become circumcised. They convinced themselves that circumcision was a good option because others like them had made the same decision.
The quantitative survey data provide supportive evidence that first-hand encouragement was important not just among the in-depth interview respondents, but also in the full study sample. At the baseline, 19 percent of the full sample of respondents had heard of someone who had gotten circumcised at the study’s partner clinic, most often, one of the respondent’s friends. In the baseline survey, there was an association ($\chi^2 = 64, p<0.001$) between knowing someone who had gotten circumcised and hypothetical willingness to get circumcised. Even more important, as shown in Figure 2, those who reported at baseline that they had heard of someone getting circumcised at the partner clinic were more likely to have contemplated getting circumcised, more likely to have contacted the clinic for information on circumcision, and more likely to have obtained the circumcision surgery as of the follow-up survey one year later. All of the differences shown in Figure 2 are statistically significant at the $\alpha = 0.05$ level.

[Figure 2 about here.]

The associations shown in Figure 2, combined with the descriptions of decision-making processes in the in-depth interviews provide strong evidence for the role of social networks in uptake of medical male circumcision. The interview responses indicated that men, even those who expressed willingness, consulted with their peers to obtain additional information and to assess social norms about circumcision.

**Social networks and perceived control**

In addition to facilitating the construction and dissemination of social norms regarding circumcision, social networks also influenced respondents’ perceived control or perceived ability to obtain a circumcision (Box C in Figure 1). Cost was one of the most commonly mentioned structural barriers to circumcision in this study, and included the fee for the procedure and the...
opportunity cost of time away from work for the healing period. We found that social networks influenced respondents’ perceived control in two ways. First, as discussed above, peers were a source of information on the circumcision process, including costs and quality of service provision. In that way, social networks directly affected how feasible it seemed to obtain the surgery. Second, through their stories about the process, social network members influenced the salience of potential barriers to getting circumcised. The level of encouragement or discouragement from social networks altered respondents’ motivation to overcome structural barriers to undergoing the procedure and thereby indirectly affected the perceived importance of those constraints. These findings are consistent with previous studies that have claimed that the importance of cost as a barrier to obtaining a circumcision varied by the level of normative support for the procedure (Westercamp & Bailey, 2007).

Many respondents relied on their social networks to learn detailed information about the circumcision procedure, and what they were told affected their perceived control. Juma said, “I asked them [his friends] about how much they thought I would be required to pay at the hospital, some said two thousand kwacha and others said one thousand five hundred kwacha.” Juma considered this input about the cost of the procedure when deciding whether he wanted to get circumcised. Gift talked to his friends about circumcision and the information they conveyed about the process discouraged him from getting the surgery: “What terrified me most was what they were saying that one can stay even for a month before the wound can completely get healed.” For Juma and Gift, as well as many others, the details about circumcision obtained from their social networks were used to assess the feasibility of getting circumcised. In that way, information from their social networks, whether accurate or not, directly influenced their perceived control over the circumcision decision.
The second avenue for the influence of social networks on perceived control was more indirect. The level of encouragement or discouragement from social networks influenced respondents’ motivation to overcome structural barriers and thereby affected the perceived importance of those barriers. This indirect effect is best illustrated with a pair of examples.

The details of Francis’ experience were instructive. For Francis, perceived control was undermined by fear instilled by social network rumors of pain and potential damage. At first, Francis had decided that circumcision was a good option for him and went to the study partner clinic to get circumcised. He arrived at the clinic during a lunch break and was told to return later in the afternoon. After leaving the clinic he discussed his plans with a group of friends who reacted with cautionary tales emphasizing the time out of work for the healing period. He explained, “so when I came here and explained that to my friends they said, ‘it's not like when they have just done that [surgery] then the same day you will be walking here and there, to and from... No, you stay while laying down for one week.’ So that's when I started thinking deeply... I depend on piece works to eat. Now, what will I do if am going to spend a week laying down?” The reaction from his peers caused Francis to focus on the recovery period and to rethink his intentions. In other words, the feedback from his social network caused Francis to re-evaluate his perceived control and to determine that the opportunity costs were too great. He did not make returning to the clinic and priority and he had not gotten circumcised by the time of the follow-up survey one year later.

Jeremiah’s experience provides a contrasting example. Initially he had reservations about circumcision, but after watching his friend go through the process he became highly motivated to get circumcised. Because his confidence had been boosted by his friend’s experience, Jeremiah decided to get circumcised at the same clinic his friend had attended rather than the study’s
partner clinic, even though that meant that he would have to pay full price for the procedure. While Jeremiah was wealthier than the average man in our sample, he still had to sacrifice to cover the cost of the circumcision. He explained that he used money usually allocated to his lunch and his transport to cover the cost of his circumcision: “Like lunch money. I had problems with lunch because I could not take money allocated for household use to be buying lunch; that would be bringing in more problems. Sometimes I could also go to work on foot because some of the money I used could also be used for transport.” Like most men in the study, Jeremiah did not want to use money normally allotted for household consumption for his circumcision, but nonetheless he found a way to pay for the procedure. The encouragement he received from his social network persuaded him to make an effort to reduce the cost barrier to circumcision and increase his control over the behavioral choice. In sum, interactions with his peers affected how he reacted to a potential obstacle and thereby affected his perceived control.

Feedback from social networks, combined with men’s own attitudes about medical circumcision, affected how they evaluated the cost of the procedure and how much they were willing to prioritize circumcision over other resource needs. Perceived control depended not only on an objective assessment of the respondent’s resources, but also on whether respondents thought that their social networks would support prioritizing the use of resources for circumcision.

**Social network consultation takes time**

A final important result of the consultation process was that men required time to assimilate and contemplate all available information regarding circumcision and eventually determine whether circumcision was a good choice for them. Opting to get circumcised as an
adult is an emotion-laden decision. Also, respondents often needed time to reconcile conflicting information received from various social network members. Sometimes inconclusive results of consultations led to never forming a final behavioral intention and never getting circumcised. Overall, consultation was a time consuming process.

Juma described a long consultation process during which he sought information and advice from a variety of sources. When he first heard about circumcision for HIV prevention he turned to his friends for more information. His friends responded with scary rumors about botched circumcisions, but Juma was not satisfied with their level of knowledge so he continued searching for more information. He explained, “And then I asked another person, then another one, and again another one. Then I said, I think the other one was telling me lies. Then I said this one is telling the truth, just like this one is also saying the truth. I said to myself that I was still going to get the real answer.” Juma had to invest considerable effort in combing his networks for information that he deemed trustworthy.

Likewise, Solomon needed time to contemplate the practice of circumcision and consult his social network before forming his behavioral intention. When asked what came to his mind when he received the voucher for a circumcision, Solomon responded, “since it was [my] first time [learning about circumcision], it was something very confusing to me...” When consulting his social network, Solomon heard rumors about failed healing processes resulting in the loss of the penis. He also heard that men who are circumcised have increased sexual pleasure. Overall, he explained that he was unable to obtain adequate explanations from his social networks so that he could weigh all of the potential risks and benefits of the procedure. He said, “We people should know what the real truth is, the one that happens... So that we should be encouraged or not... We lack counseling so that we may know what the real truth is.” After investing time in
consulting his social networks, Solomon felt normative ambivalence and a lack of motivation for circumcision, which ultimately resulted in behavioral inertia.

Thomas, who got circumcised, remarked that he had wanted a circumcision for 1.5 years before the arrival of the research team and explained his period of inaction by saying, “when you people are doing research there is need for you to tell the people things ‘zogwira mtima’ [that touch their heart]. We people have difficulty to understand what we knew a long time ago to be changed within a matter of a day; it is something difficult.” Later he continued, “Because when you are putting into the mind of a person something that you are saying is good, you have to oppose something that he knows before you tell him, you see that? Or what their parents told them, yeah.” Thomas highlighted the fact that when adult male medical circumcision was introduced as an HIV prevention strategy, circumcision suddenly became a relevant option for men who previously thought that circumcision did not apply to them. The new messages conflicted with prior norms regarding circumcision, learned from older generations, as a practice that was conducted only on young Yao or Muslim boys. He explained that it takes time for people to collectively reconstruct social norms and evaluate a new behavioral practice.

In fact, the distinguishing feature of most of the respondents who did undergo circumcision was that they had already taken the time to contemplate the pros and cons of circumcision and consult their social networks before the arrival of the research team. They had already made the decision that they wanted to be circumcised. Out of the 29 interview respondents who were circumcised during the research project, 21 of them stated clearly that they knew before their first survey interview that they wanted a circumcision. When the research team arrived, therefore, and offered a substantial discount on the price of circumcision, many of them were eager to take advantage of the opportunity.
Steven, who got circumcised, hypothesized that others did not undergo the procedure because they needed time to digest the new information. He said,

“Like for me I feel that the goodness was that that thing found me when I already had the thought, you see? Yeah, so when the person [researcher] came and gave me the voucher, it was like he was just adding onto the thought that I already had. But let's suppose the way you came, you have just come and you have found me in other thoughts and you are introducing another topic that is not in my head.” A bit later he continued, “That's why maybe those people did not go. But I see that we people who went maybe we already had those thoughts, yeah.”

In sum, it took time to decide whether getting circumcised it was a good choice. The majority of respondents who got circumcised were those who had decided before the arrival of the research team that they wanted a circumcision. Their responses reinforce the finding that men needed time to shape their own beliefs and their perceptions of others’ beliefs about the practice. Consultation with social networks played an important role in the process of forming behavioral intentions. Those with genuine interest in circumcision invested time in evaluating social norms and control before making a decision about the procedure.

5 Discussion

The results described in this paper come from in-depth interviews with a sub-sample of men in a survey experiment designed to investigate prospects for scaling-up male circumcision for HIV prevention in urban Malawi. The longitudinal and experimental design of this study allowed us to measure actual uptake of adult male circumcision, rather than hypothetical acceptability. The quantitative results indicate that while approximately half of the survey respondents reported in
the baseline survey that they would be willing to get circumcised, only 3 percent of them actually did get circumcised in the year after the baseline survey.

The in-depth interviews provide insights that help to explain the gap between expressed attitudes and actions. We found, first, that about half of the respondents expressed no real interest in circumcision, corresponding with the fifty percent who reported in the quantitative survey that they would not be willing to get circumcised. Among the other half of the respondents, those who did not get circumcised continued to express genuine interest in undergoing circumcision. Many of them demonstrated their motivations by describing the flaws in other HIV prevention methods. These men had positive attitudes about circumcision, but a positive attitude was not a good indicator of behavioral intentions.

Even among those with genuine interest, very few managed to get the circumcisions that they claimed they were willing to undergo. Respondents explained that medical male circumcision was a relatively new and uncommon practice in Malawi. As such, many men thought of circumcision as a practice of others, and had never contemplated the possibility of being circumcised themselves. Men needed time to consult with their social networks to gather additional information from peers and to collectively evaluate the practice. In the language of the theory of reasoned action (Fishbein & Ajzen, 2010), respondents consulted with their social networks to assess norms and control before ultimately determining their behavioral intentions. This meant that social networks influenced uptake of circumcision. Respondents who knew someone who had been circumcised at the study’s partner clinic were significantly more likely to contemplate getting circumcised, to take action to learn more information about circumcision, and to actually get the circumcision surgery. On the other hand, it was difficult to prioritize
circumcision enough to overcome fears and structural barriers when the practice was questioned or discouraged in social network exchange.

Existing literature on health behavior innovations indicates that social networks play an important role in the dissemination of information, the joint evaluation of new ideas and behaviors, and the assertion of social pressures that encourage or discourage particular actions (Bongaarts & Watkins, 1996; Montgomery & Casterline, 1996; Agadjanian, 2001; Behrman, Kohler, & Watkins, 2002; Avogo & Agadjanian, 2008; Godlonton & Thornton, 2012; Oster and Thornton, 2012). As has been noted in studies of new contraceptive techniques (Rutenberg and Watkins, 1997), our findings indicate that the circumcision advice of “experts,” such as youth advisors, clinic personnel, and the research team, was valued and seriously considered, but it was not a substitute for informal conversations with peers. Social networks were used to obtain information on the circumcision process from people whose experience and social circumstances were familiar, and who were perceived as less likely to be promoting an agenda.

Also consistent with existing studies (Agadjanian, 2002), respondents’ social networks were gendered, meaning that men mostly interacted with other men, and this influenced the type of information that was exchanged. Stories conveyed during the in-depth interviews indicated that information shared among male peers was often weighted heavily toward scary rumors about circumcisions resulting in disfiguration or amputation of the penis, playing off of fears of physically diminished masculinity. Although recognized as factually suspect, the rumors evoked an emotional response from many men that prevented them from making circumcision a priority. On the other hand, some respondents received convincing encouragement from male peers who had already undergone circumcision and who shared first-hand knowledge about the process and
provided normative support for the procedure. Some respondents used the encouragement from peers as motivation to overcome both their fears and the structural barriers.

It is important to note that the decision-making process and the role of social networks described by these Malawian men may be specific to the context where adult male medical circumcision is relatively rare. National efforts to promote circumcision have been limited thus far. In other settings, male circumcision for HIV prevention has been introduced with extensive community mobilization efforts and campaigns. For example, in the township of Orange Farm, South Africa, an intensive pilot intervention introduced a center for medical male circumcision and within two years almost 40 percent of previously uncircumcised men over the age of 15 had undergone circumcision (Lissouba et al., 2010). In Kenya, more than 230,000 circumcisions have been performed in target communities since the launch of a national program in late 2008 (Herman-Roloff et al., 2011).

Large-scale community mobilization campaigns likely alter the availability of information on circumcision and the contents of social network exchange about the practice. Expert advice on the process and benefits of circumcision becomes readily accessible. Perhaps even more important, after the initial rollout in the target sites, men would have easy access to first-hand accounts of medical circumcision from their peers. With widespread uptake of circumcision, it is probable that the social norms regarding the meaning and value of circumcision would begin to emphasize its benefits and broad appeal. Men in our sample were discouraged from investing resources in circumcision because information from their social networks instilled doubt as to whether it was a good choice. In the sites where there has been rapid uptake of circumcision, a shared belief in the benefits of the practice would make it easier for men to prioritize the investment of time and resources in the procedure.
In addition to recognizing that the setting for this study is a low-uptake environment, it is also important to note that the results are representative of young men in urban Malawi, but they cannot be generalized to more rural areas of the country. As urban dwellers, these men have more access to healthcare services, more access to media, and higher educational attainment than their rural counterparts. In addition, they live in more socially heterogeneous communities and they may be more removed from the customs and influence of their elders. Further research on decision-making regarding adult male medical circumcision in a variety of settings is needed.

The findings from the qualitative component of this study highlight the importance of social networks in the uptake of medical male circumcision. Future efforts to scale-up provision of circumcision for HIV prevention should be aware that most men will require time to collect input from their social networks in addition to information from health experts before deciding whether they want to undergo the surgery. Moreover, social networks could be used as a tool of information dissemination, especially by encouraging men who have undergone the surgery to share their experiences with their peers.

We find that there is genuine interest in circumcision for HIV prevention among a substantial portion of the participants in this study in urban Malawi. Successful interventions will need to tap into this latent demand. If the supply of circumcision services can be expanded and uptake of circumcision increased, shifting social norms regarding the practice may help reduce many of the stumbling blocks in the decision-making process, including the structural barriers that now prevent men with moderate levels of interest in circumcision from choosing to undergo the surgery.
References


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<td>Tumbuka</td>
</tr>
<tr>
<td>Yao</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td><strong>Religion:</strong></td>
</tr>
<tr>
<td>Christian</td>
</tr>
<tr>
<td><strong>Wealth:</strong></td>
</tr>
<tr>
<td>Median monthly expenditures (USD)</td>
</tr>
<tr>
<td><strong>Health and Sexual Behavior:</strong></td>
</tr>
<tr>
<td>Ever had sex</td>
</tr>
<tr>
<td>Number of sexual partners in past year</td>
</tr>
<tr>
<td>Ever used a condom</td>
</tr>
<tr>
<td>Ever been tested for HIV</td>
</tr>
<tr>
<td>Believes circumcised men have lower risk of HIV</td>
</tr>
<tr>
<td>Heard of someone circumcised at partner clinic</td>
</tr>
<tr>
<td>Willing to be circumcised</td>
</tr>
<tr>
<td><strong>Sample size (n)</strong></td>
</tr>
</tbody>
</table>

Figure 1: Theory of Reasoned Action (Fishbein & Ajzen, 2010)

- Box A: Attitude
- Box B: Perceived norms
- Box C: Perceived control
- Box D: Behavioral intention
- Box E: Actual control
- Box F: Behavior
Baseline: Hypothetically willing to get circumcised
Follow-up: Contemplated getting circumcised
Follow-up: Contacted clinic for info on circumcision
Follow-up: Circumcised since baseline

Heard of someone circumcised at clinic  NOT heard of someone circumcised at clinic

Figure 2: Role of Social Networks