

# Evaluation of a project to reduce morbidity and mortality from traditional male circumcision in Umlamli, Eastern Cape, South Africa: outcome mapping

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Keywords: traditional circumcision, community-orientated primary care, amaXhosa, disease prevention, outcome mapping

## Abstract

**Background:** Traditional circumcision is common among the amaXhosa in Umlamli, Eastern Cape. Circumcision is associated with high morbidity and mortality. The need to reduce complications was identified as a priority by the local community. The aim was to design, implement and evaluate a project to improve the safety of traditional circumcision.

**Method:** A safe circumcision team was established and comprised health workers, community leaders and traditional surgeons. Outcome mapping involved three stages: intentional design, outcome, and performance monitoring and evaluation. The eight boundary partners were the initiates, parents, community leaders, traditional surgeons, the District Health Services, the provincial Department of Health, the emergency services and the police. Outcomes, progress markers and strategies were designed for each boundary partner. The team kept an outcome and strategy journal and evaluated hospital admissions, genital amputations and mortality.

**Results:** Ninety-two initiates were circumcised, with two admissions for minor complications, compared to 10 admissions, two amputations and two deaths previously. More than 70% of the outcome measures were achieved in all boundary partners, except emergency services and the Department of Health. The key aspects were: the use of outcome mapping, the participatory process, a lower age limit, closure of illegal schools, consolidation of accredited schools, training workshops for traditional surgeons, private treatment room for initiates, assistance with medical materials, pre-circumcision examination, certificates of fitness.

**Conclusion:** This study has shown the value of community-orientated primary care initiatives to address local health problems. Key lessons were identified and the project could easily be replicated in communities facing similar challenges.

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S Afr Fam Pract 2012;54(3):237-243

## Introduction

Among the amaXhosa, traditional circumcision is part of the rite of passage for all boys in the community. Circumcision confers socially approved adult status, the right to marry and eligibility for other social events in the community. An uncircumcised adult male cannot inherit and has to be treated as a minor.<sup>1</sup> The ritual is usually carried out twice a year, in June and December, when initiates are enrolled in the circumcision schools. The initiates stay in the school for about three to four weeks and observe all the cultural rites, including learning about sexual, individual and community values.<sup>2</sup> The initiation ritual, therefore, is not only about circumcision, but also incorporates the teaching of community values and responsibilities expected from the initiates as men.<sup>3</sup> Overall, a significant stigma is attached to noncompletion of the ritual.<sup>1,2</sup>

Traditionally, the surgeons (ingcibi) perform the surgery with the use of a spear (assegai or umdlanga), after which the traditional attendants (ikhankatha) take over the management of the wound.<sup>2</sup> Traditional leaves are used as medicinal cover, with a crepe bandage. Initiates are often exposed to an unsterilised blade, which may also be used on dozens of other initiates in a single session, leading to high infection rates and other complications.<sup>4</sup> Initiates are not allowed to drink water or take salt, as it is believed that this prolongs wound bleeding and healing.<sup>2,4</sup> Unhealthy surroundings, like cold and dusty holding rooms, and incompetent attendants have also been cited as factors that contribute to dehydration, wounds and respiratory infections.<sup>2</sup> Complications have been attributed to unqualified surgeons, negligent traditional attendants, irresponsible parents and medically unfit and underage youths.<sup>2</sup>

In the Eastern Cape, many initiates have died following circumcision and others have to face life with mutilated genitals or genital amputation.<sup>2</sup> Medical problems that the initiates are exposed to include: poor wound healing, infection of the penis with gangrene, septicaemia leading to pneumonia, meningitis and acute renal failure.<sup>1,2,4</sup>

As a result of these medical problems, the Application of Health Standards in Traditional Circumcision Act, Act No. 6 of 2001, was introduced to regulate traditional surgeons.<sup>5</sup> Nevertheless, the incidence of circumcision-related complications and fatalities remained unchanged in the Eastern Cape between 2001 and 2006,<sup>1</sup> and many illegal circumcision schools still operate.

In December 2008, 10 initiates from the Umlamli community in the Eastern Cape were admitted to the local hospital. Two of the initiates died and two required genital amputation. The community leaders approached the health workers in the local hospital to set up a safe circumcision project so that their initiates could complete the ritual in future without risking their health.

The main purpose of this research therefore was to design, implement and evaluate a project to improve the safety of traditional male circumcision practices in the Umlamli community, with the ultimate goal of reducing the associated high number of complications and the mortality rate.

## Method

### Study design

This study used outcome mapping as a method for project design,<sup>6</sup> monitoring and evaluation. This study design involved three main stages (Figure 1):

- Intentional design
- Outcome and performance monitoring
- Evaluation

### Setting

Umlamli is a rural Xhosa community in the Ukhahlamba district of the Eastern Cape Province of South Africa,

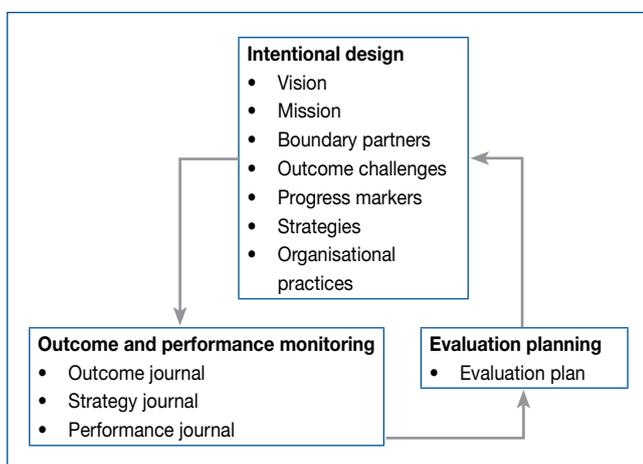


Figure 1: Diagram of the outcome mapping process

comprising 12 villages and a population of about 140 000 people, who are mostly unemployed and poorly educated. There are five primary care clinics that refer to the Umlamli District Hospital. The principal researcher is a doctor at the hospital.

### Safe circumcision group

During 2009, a team was selected with the help of the researcher and from nominations made by the community leaders. Selection was based on the people's potential influence, expertise and interest in community activities. In addition to the researcher, 14 other people joined the group:

- Four male nurses from the clinics
- The community youth leader
- Two community health workers
- A community leader who was also head of the safe circumcision group
- The community head of the traditional healers
- The coordinator of the traditional surgeons in the community
- The outpatient clerk at the hospital, who also worked as a research assistant
- The chairman of the hospital board
- The chief administrative officer of the hospital
- The local Roman Catholic priest

The team met every two weeks from February 2010 onwards, aiming to target the June circumcision ceremony, and also at the end of the ritual to assess the progress made.

### Intentional design

The group's vision was to create a better system for safe circumcision practices in the Umlamli community in order to eradicate mortality and reduce complications as far as possible. Primarily, our mission was to implement a standard protocol for safe circumcision by traditional surgeons and their schools. In order to achieve this mission the group identified a number of boundary partners.

Boundary partners were defined as people or organisations that the group would interact with and seek to influence:

- Initiates
- Traditional surgeons and attendants
- Parents
- Community leaders
- District Health Services
- Provincial Department of Health
- Emergency medical services
- Police

For each of these boundary partners, the group defined the outcomes that they hoped to see by the end of the project. The group then defined the activities or strategies that they would engage in to achieve these outcomes (Table I).

Table 1: Planned outcomes and strategies for the eight boundary partners

Boundary partner	Outcomes	Strategies
Initiates	<ul style="list-style-type: none"> <li>That they are fully informed about the new practices and are ready to apply them for their own safety</li> <li>That they are willing to report complications and accept treatment</li> <li>That they are at least 16 years old and do not attend illegal circumcision schools</li> </ul>	<ul style="list-style-type: none"> <li>Educational talks as part of the pre-circumcision examination for initiates and parents, using the nurses in the team and the project coordinator</li> <li>Use of IDs, birth certificates or age declaration, with a parental consent form fully signed on entry to the circumcision school</li> <li>A pre-circumcision examination and certificate of fitness was issued and signed by a medical doctor before the initiates could proceed to the initiation school</li> </ul>
Parents	<ul style="list-style-type: none"> <li>That they adhere to the required age of initiates for the ritual</li> <li>That they do not support illegal circumcision schools in the area</li> <li>That male circumcised parents or guardians who visit their initiates should take responsibility to raise the alarm if there are problems</li> </ul>	
Traditional surgeons/ attendants	<ul style="list-style-type: none"> <li>That they attend the training course before the initiation</li> <li>That they embrace the new practices and standards set by the project, like the use of surgical blades instead of an assegai (spear)</li> <li>That they observe the correct infection control measures</li> <li>That there is an improvement in prompt recognition of complications and need for referral</li> </ul>	<ul style="list-style-type: none"> <li>Activities to make them aware of the project and its goals</li> <li>Pre-circumcision training workshops focusing on safe circumcision practices, infection control, HIV, recognising complications and seeking help</li> <li>Provision of resource materials from the hospital and relevant stakeholders, to be used during the workshop as well as during the initiation itself</li> </ul>
District health services	<ul style="list-style-type: none"> <li>That health practitioners identify and treat complications as they arise, and refer promptly if the problem is beyond their scope of practice</li> <li>That they support and assist the project by offering the required materials and a venue for the training of those involved with the rituals</li> <li>That they provide health personnel to visit the initiates frequently, attend to complications and refer if necessary</li> </ul>	<ul style="list-style-type: none"> <li>Collaboration between the Department of Health and Umlamli Hospital, to assist with the provision of resources and materials</li> <li>Equip and organise the clinics and hospital for handling emergency situations</li> <li>Provide an isolated room where initiates can be treated separate from other patients</li> <li>Provide a venue for training and transport for team members to attend meetings</li> </ul>
Provincial Department of Health	<ul style="list-style-type: none"> <li>That they provide assistance with materials for the rituals, e.g. provision of surgical blades, medications, blankets and materials for the construction of standard tents to assist the initiates in withstanding the environmental hardships during the ritual</li> <li>That they provide assistance with the six-monthly training and evaluation sessions of the traditional surgeons and attendants, and provide certificates of endorsement when the attendees are fully qualified</li> <li>That they provide assistance with the reinforcement and upholding of community law, and promote the implementation of the Safe Circumcision Act of 2001</li> </ul>	
Emergency medical services	<ul style="list-style-type: none"> <li>That they are aware of and support the proposed practices by sending out special ambulances for transporting initiates to an appropriate place for treatment</li> <li>That they accept, and are involved in, the training proposed by the project team</li> <li>That they use mobile telephones to make calls to clinics or the hospital before transporting any initiates, to help in triaging or making concrete plans for prompt treatment</li> </ul>	<ul style="list-style-type: none"> <li>Effective communication and triage of emergencies between the District Health Services and the emergency medical services</li> <li>Equip the emergency medical services with the equipment and personnel necessary for the survival of initiates</li> </ul>
Community leaders and elders	<ul style="list-style-type: none"> <li>That they support and encourage the use of the safe practices proposed by the team by their followers</li> <li>That they create rules governing the use of the practices of the project, actually enforce them, and discourage the use of illegal circumcision schools and underage initiates</li> </ul>	<ul style="list-style-type: none"> <li>Obtain their consent and support</li> <li>Use them to disseminate information before and during the project</li> <li>Enhance the trust and acceptance of the project by the community</li> <li>Reinforce the importance of a pre-circumcision examination for all the initiates as well as the presentation of certificates of fitness, together with a parental or guardian-signed consent form, before initiates are accepted for initiation</li> </ul>
Police	<ul style="list-style-type: none"> <li>That they are fully involved in the project, and discourage or bring to justice those involved with illegal circumcision schools</li> <li>That they are fully involved in the verification of those directly involved with rituals, like the surgeons, to confirm that their certificates are valid and updated</li> </ul>	<ul style="list-style-type: none"> <li>The project also obtained the backing of the police and the community leaders to adopt a punitive measure for those practising illegal circumcision in the community. As was requested, a special police task team (two police officers) was delegated to circumcision issues</li> </ul>

The group defined specific progress markers for each boundary partner's desired outcomes. These were graduated stepping stones that the project employed as monitoring tools.

These specific progress markers were defined at three levels:

*What we expect to see:* immediate reactions of boundary partners to the project initiatives, e.g. attendance at meetings

*What we would like to see:* real engagement with the intended changes, e.g. use of circumcision materials provided and participation in training

*What we would love to see:* deeper changes in values, goals or beliefs of the boundary partners, e.g. that the traditional surgeons or attendants integrate the new skills into their current and future practice

### Outcome and performance monitoring

The project was monitored by the project team on a regular basis at three levels.

The *first level* of monitoring used the progress markers to assess progress towards achieving the outcomes. An outcome journal was used to record the level of change by periodically rating the achievement of each progress marker as follows: low (no or very little progress), medium (some evidence of progress) or high (marker completely achieved). The outcome journal also contained a description of changes observed, the factors leading to these changes and the documentary evidence for change. It also included any unexpected or unanticipated changes, lessons learnt and any necessary changes to the project.

The *second level* of monitoring looked at the strategies. This required regular reflection by the team and revision of the strategies. The strategy journal included a description of the activities performed, how effective these were thought to be, the lessons learnt and what changes the programme should adopt to achieve more positive results.

The *third level* of monitoring involved the project team and its organisational practices. It involved reflection on how well the team performed, and also elicited feedback from key boundary partners on their experience of the team. The team reflected on the values embedded in the project organisation (e.g. respect for the traditional leaders and confidentiality), as well as the effectiveness of their teamwork. A questionnaire was used for assessing the effectiveness of the team.<sup>7</sup>

### Evaluation

The team collected data on admissions, the number of complications and any deaths from the years preceding the project and during the project period. The province has a special notification form designed for reporting complications and mortalities from circumcision.

### Ethical considerations

Ethical approval was obtained from the Health Research Ethics Committee of Stellenbosch University and permission was obtained from the provincial Department of Health and the community leaders.

### Results

Out of 92 initiates enrolled in Umhlangi in June 2010, only two were admitted to hospital, with haemorrhage and penile sepsis. There were no amputations or deaths, and the evaluation as compared with previous years in Figure 2, shows that since the safe circumcision group was formed in 2009, the morbidity and mortality have fallen considerably.

Figure 3 shows the extent to which the outcomes were achieved by each boundary partner. The score (high = 2, medium = 1, low = 0) from the rating of the progress markers was expressed as a percentage of the total score possible, if all progress markers were fully achieved. The figure shows that 70% or more of the outcomes were judged to have taken place among the traditional surgeons, initiates, police, parents and community leaders. The project was less successful in terms of the provincial Department of Health and the emergency medical services.

The strategies and outcomes are discussed below in relation to each of the boundary partners, based on information obtained from the outcome and strategy journals.

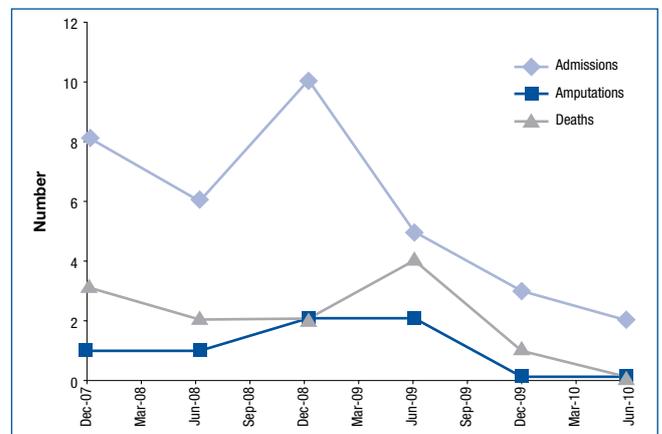


Figure 2: Hospital admissions, genital amputations and deaths from circumcision

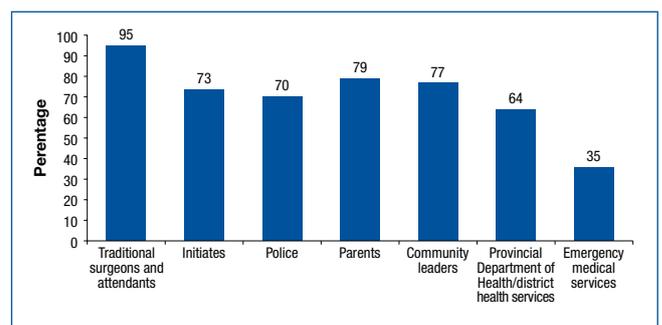


Figure 3: Percentage of the progress markers achieved by each of the boundary partners

### Initiates

All 92 initiates attended the pre-circumcision assessment and educational talks and obtained a certificate of fitness. In previous years, numbers were usually less than 40. All the initiates were 16 years or older, as confirmed by identification card, birth certificate or parental affidavit.

Medical assessment included any current illness, past medical history, physical examination, a full blood count and other investigations, such as human immunodeficiency virus (HIV) and rapid plasma regain test (for syphilis), as indicated. All the initiates received tetanus toxoid and benzathine penicillin as standard injections. There is little existing evidence regarding what to include in such a pre-circumcision assessment and therefore these items were selected as likely to identify those with a higher risk of complications. Medical assessment revealed that two initiates were on insulin, six were epileptic, one had completed treatment for tuberculosis and two had penile warts. Those with medical problems were followed closely during the initiation period.

All parents signed a consent form, stating that they were willing for their child to attend the circumcision school. The two initiates who developed complications presented quickly to the health services and were able to return and complete the ritual after treatment.

### Parents

Most parents or guardians accompanied the initiates to their pre-circumcision assessment and participated in the health talks. Most attended the community meetings before, during and after the circumcision period. They co-operated with the requirement to send only children 16 years or older and provided the necessary proof. Some parents thought that the threshold should rather be 18 years and above. The parents only used the registered schools and even reported illegal schools to the authorities. It was reported that male parents visited their children at regular intervals during the initiation period. This was in contrast to the practice formerly, which was to simply wait and see who returns, and if your loved one does not return it was simply to be accepted.

### Traditional surgeons and attendants

The commitment of the head of the traditional surgeons to tackle the problem is seen in this quote:

“We asked the hospital board chairman and the community elders to approach the doctors, and to see if our boys are medically fit to undergo the ritual as an increase in number of deaths is not acceptable.”

The traditional surgeons supported the application of the Safe Circumcision Act of 2001 and requested the initiates to have a medical fitness assessment. They agreed to not accept anyone without a certificate.

A three-day workshop was attended by the six traditional surgeons and four attendants a month before the ritual. The surgeons were trained in the use of a sterile surgical blade and in infection control (gloves, hand washing, antiseptics). Materials for the circumcisions, such as surgical blades, gloves, bandages and antiseptic solutions, were provided by the district hospital. It was felt that this should be a regular and ongoing event before each initiation period. Certificates were issued or re-endorsed after the training. The surgeons and attendants requested that a standard protocol be written as a constant reminder or guideline to follow in subsequent rituals.

The reports from the four nurses who visited the school twice weekly, the parents who visited the school and the initiates spoken to randomly by the team nurses, revealed that the traditional surgeons used surgical blades and applied infection control practices by wearing gloves and washing their hands between initiates.

### Community leaders

Unlike before, when they viewed this issue as being highly secretive, the elders now engaged deeply with the team, the parents and the traditional surgeons in such a way that the vision of the project was understood as being for the benefit of the initiates and the community. The elders created new rules that now governed the initiation ritual, like urging initiates to seek medical attention if required (as opposed to the old belief of “not being a man” when doing so), and held meetings with the parents and police to ensure that the initiates were the correct age, and took measures to eradicate illegal circumcision schools.

Eight community leaders held meetings with the team on several occasions to discuss issues like age limits and the pre-circumcision examination, and later to report back to their community. Leaders encouraged attendance at the pre-circumcision assessment and reassured the community that the project did not conflict with their cultural values and practices. The community elders, the traditional surgeons and the team held two joint meetings of all eight elders and the 10 traditional surgeons and attendants. The community leaders negotiated the combination of the registered schools into two, each of which could handle 60 initiates.

### District health services and provincial Department of Health

The district gave permission for the team to carry out the project, they cooperated fully, and a designated person was assigned to oversee the activities relating to circumcision. She assisted with providing health information that the team worked with. The assignment of a district person in charge of circumcision issues made things easier, as complaints and important issues were then channelled to higher authorities, like the district manager, without delay.

The hospital supplied materials in support of the project, provided a venue for meetings, and assisted with the transportation of team members. Training was provided by the District Health Services with support from the province. More than 160 surgical blades and 160 pairs of surgical gloves were distributed to the surgeons and attendants by the district hospital. A room was set aside for the treatment of initiates with complications so that they would feel more comfortable accepting medical treatment at the hospital. It was hoped to build permanent structures at the schools for initiates experiencing complications, but this did not materialise.

### Law enforcement

Collaboration between the health workers, police and community elders was fundamental to the success of the project. The two designated policemen attended the three meetings scheduled between the team, elders, traditional surgeons and police. They assisted with issuing affidavits to initiates without identification documents. The police closed down five illegal schools and arrested four people. They were also involved with the verification of the surgeons' certificates. Reports show that the police visited the schools randomly and requested the certificates of fitness from the initiates after obtaining permission from the traditional surgeons. The police also assisted in maintaining peace and calm in the schools, as physical assault is commonly used as a punishment for initiates who disobey the rules. One police officer stated that:

"You and your team have done so well that cases of assault during this June circumcision were not received, which is unusual for us, especially from Umlamli."

### Emergency medical services

The emergency medical personnel appeared supportive of the project, but several recommendations could not be implemented owing to financial constraints. There were only two ambulances for the whole area and it was not possible to have a more dedicated service. Response times may still be a problem for medical emergencies and alternative transport may be required. The services helped train the health workers at the district hospital in the appropriate triage of emergency patients. It was not possible to provide mobile phones instead of the radios. Unfortunately it is not possible to communicate directly with the health facilities via the radios to warn them of an imminent emergency.

However, there was a general upgrade of the ambulances, which we regard as a welcome development.

### Organisational practices

As part of the team's organisational reflection, a questionnaire was used to assess the effectiveness of teamwork as a form of internal audit. The results are shown in Table II.

**Table II:** Results of questionnaire on effective teamwork by the project team

Criteria (Scale of 1= poor to 5 = good)	Team score (n = 5)
<i>Team goals:</i> I am very clear about what our team is trying to achieve and we all put our efforts into it	4.8
<i>My role:</i> In almost every situation I am sure about what my responsibilities are and what other team members are supposed to be doing. When a query arises, we discuss where we each think our responsibilities lie.	4.5
<i>Procedures:</i> Everyone gets a chance to speak and to influence the discussion. We listen to everyone's contribution. No one is ignored. Everyone is drawn into the discussion.	4.6
<i>Decisions:</i> When we discuss a problem, I usually understand exactly what the issue is, what we have decided to do about it, and what my responsibilities are. Decisions made by the team are carried out effectively.	4.5
<i>Managing conflict:</i> We try to get the disagreeing parties together and let them talk through their points of view, until each can see some sense in the other's ideas. Then we try to reach an agreement that makes sense to everyone.	4.6
<i>Availability:</i> When you have a question, or need some help from another team member, there is no problem getting hold of anyone. People go out of their way to be available to each other. I have no difficulty talking to anyone on the team.	4.8
<i>Mutual support:</i> I really like my job, and working together in this team. The team encourages you to take responsibility. Other team members appreciate your efforts and help when things are not going well. We really pull together in this team.	4.8
Average score	4.6

The results show that the team roles were clear to the team members, goals were adhered to, and the procedures or activities of each team member were well understood. The decisions were taken jointly by the team and grey areas were cleared up with the help of the community leaders, who acted as an advisory council to the team. The team members supported each other, and were also supported by the community and the district health structures, especially the District Hospital. The team members were always available for meetings.

## Discussion

### Key findings

This project is a good example of community-orientated primary care, where the needs of the community are prioritised and addressed in a participatory approach between health workers, the broader community and other government sectors. The project appears to have made a significant contribution to the reduction in mortality and morbidity from traditional circumcision observed in this community.

Key aspects of this project, responsible for its success were considered to be:

- The use of outcome mapping as an approach to project

design, monitoring and evaluation

- Its participatory nature, which involved community leaders, traditional surgeons, health workers and other government sectors
- Eliciting community support for a better and acceptable age limit and the closure of illegal circumcision schools
- The running of only two larger accredited circumcision schools, enabling better access and monitoring
- The organisation of training workshops on correct surgical procedures and infection control practices, which led to an improvement in surgical skills and prompt recognition of complications
- The designation of an isolated treatment room for initiates with complications, which had a positive effect on their acceptance of treatment at the district hospital
- The district hospital's assistance with materials vital for circumcision, like surgical blades, gloves, bandages and other materials used for circumcision
- The pre-circumcision examination of initiates and the issuing of certificates of fitness

Traditional surgeons and attendants are open to engage with the health system when they are approached in a supportive and respectful way, and when they understand the importance of the change. Initiates, when spoken to and supported by their parents and elders, will be more confident to ensure that safe practices are used and realise that early treatment is life-saving. The elders were committed to making the ritual safe, while simultaneously preserving their culture, and their involvement in the project has led a transformation in the community's attitude towards the ritual. The fundamental lesson is that, in complex situations like this, elders can be the bridge between government and community. The police are an essential partner if the community cooperates and coordinates most of the activities with them, as long as they listen to the community and act in fairness when undertaking their activities.

### Comparison to literature

Most studies on traditional circumcision have described the problem rather than evaluated interventions, therefore it is difficult to compare these findings to those of other studies. However, our outcomes and results were similar to the studies carried out by Mogotlane et al.<sup>2</sup> and Peltzer et al.,<sup>8</sup> where most complications arising from traditional circumcision were as a result of poor operation techniques, ignorance of the correct infection control practices, and the usually unhygienic manner in which the surgery was carried out.

### Limitations and strengths

The project struggled without dedicated funds other than donations made by the team doctor and the Catholic priest. Team communication was hindered by a language barrier as not everyone, including the researcher, was fluent in Xhosa

and translation was required. It is not possible to say if the changes implemented in the project will be sustained over time.

### Implications and recommendations

It should be possible to replicate this participatory approach and to implement similar changes in other communities facing the same challenges. Ongoing commitment to sustain the initiative will be needed from the District Health Services and the Department of Health. Further evaluation of these changes in a larger scale project could provide more evidence of the benefit.

### Conclusion

This study has shown the value of community-orientated primary care initiatives to address local health problems. A participatory process involving health workers, the community and government departments utilised outcome mapping to design, implement, monitor and evaluate a project to reduce morbidity and mortality from traditional circumcision. Key lessons were identified and the project could easily be replicated in communities facing similar challenges.

### Acknowledgements

The authors would like to acknowledge the members of the safe circumcision team and other people who assisted with the project: Mr Ndaba, Mr Solani, Mr Mtsishe, Dr Mrwebi (Umlamli District Hospital); Mr Zukswa, Mr Lulamile, Mr Zama, Mr Mbangula (clinic nurses); Chief Cawa, Chief Nzinzana, Chief Yalwa, Chief Tyokolo, Chief Bafazini, Mr Rini, Mr Bafazini (community elders and leaders); Mr Nkamana (head traditional surgeon); Mr Ngqebe, Mr Mdange, Mr Nofemele, Mr Mkrola, Mr Khohlakala (community members); the Reverend Kizito; Inspector Yawathe (Police)

### References

1. Meissner O, Buso DL. Traditional male circumcision in the Eastern Cape – scourge or blessing? *S Afr Med J*. 2007;97:371-373.
2. Mogotlane SM, Ntlangulela JT, Ogubanjo BG. Mortality and morbidity among traditionally circumcised Xhosa boys in the Eastern Cape Province, South Africa. *Curationis* 2004;27:57-62.
3. Meel BL. Community perception of traditional circumcision in a sub-region of the Transkei, Eastern Cape, South Africa. *S Afr Fam Pract*. 2005;47:58-59.
4. Mayatula, V, Mavundla, TR. A review on male circumcision procedures among South African blacks. *Curationis* 1997;20:16-20.
5. Province of the Eastern Cape. Application of Health Standards in Traditional Circumcision Act. No. 6 of 2001. *Provincial Gazette* 818. 2001 Nov 22.
6. Earl S, Carden F, Smutylo T. Outcome mapping: building learning and reflection into development programs. Ottawa: International Development Research Centre; 2001.
7. Pritchard P, Pritchard J. Teamwork for primary and shared care: a practical handbook. Oxford: Oxford University Press; 1994.
8. Peltzer K, Nqeketo A, Petros G, Kanta X. Traditional circumcision during manhood initiation rituals in the Eastern Cape, South Africa: a pre-post intervention evaluation. *BMC Public Health*. 2008;8:64.