Emergency obstetric care access and quality: Learning from the experiences of women who developed urogenital fistula

Carrie Ngongo examines the causes and trends of urogenital fistula in sub-Saharan Africa, drawing on 23 years of data from nearly 7,000 women across nine countries.

Urogenital fistula poses a public health challenge in places where women have inadequate access to quality emergency obstetric care. Urogenital fistulas may occur between any part of the genital tract and nearby organs in the pelvis, including the urinary tract and intestinal tract. Most often, fistulas are ischemic: caused by pressure necrosis when women experiencing prolonged, obstructed labor are not able to have emergency caesarean sections in time to avoid injury to mother and child[1]. Obstruction occurs when the presenting part of the fetus cannot progress into the birth canal despite strong uterine contractions, due to cephalo-pelvic disproportion, malpresentation, or malposition[2,3]. Fistulas can also be iatrogenic, arising as surgical accidents. Less commonly, fistulas can occur from trauma, radiation, malignancy, unsafe abortion, infection, or congenital malformation[4].

We've been able to learn about the circumstances that led women to develop fistula thanks to detailed notes kept by fistula surgeons Dr. Thomas Raassen and Dr. Marietta Mahendeka as they traveled widely between 1994 and 2017 to conduct fistula repair surgeries and provide training to others. We converted 23 years of paper records from them and their colleagues into an electronic database that includes 6,787 women who received treatment for urogenital fistula in 89 facilities across Ethiopia, Kenya, Malawi, Rwanda, Somalia, South Sudan, Tanzania, Uganda, and Zambia.

In this large, multi-country case series, most women developed fistula during childbirth, whether vaginal (47.6%) or cesarean section (48.1%). Fistulas following gynecological surgery constituted 3.2% of the fistula caseload, while rare causes led to just over 1%[5]. These figures mask differences between countries, however. Somalia, South Sudan, and Ethiopia had comparatively high proportions of fistula following vaginal birth and birth at home. Many were complex cases resulting in both urinary and fecal incontinence. In contrast, we documented higher proportions of fistula after cesarean birth and gynecological surgery in Kenya, Malawi, Rwanda, Uganda, Tanzania, and Zambia (Figure 1)[5]. When indicated, cesarean section can save women's and babies' lives and prevent ischemic fistula.

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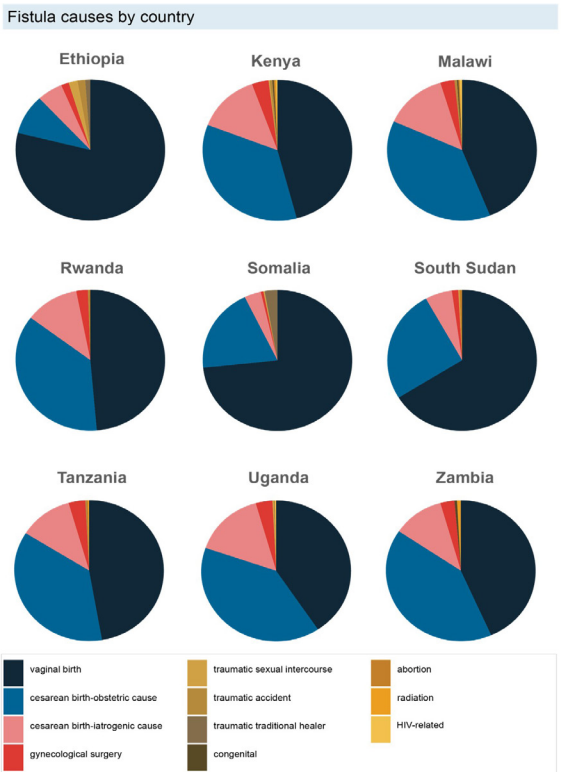


Figure 1 : Urogenital fistula causes by country

One interpretation is that the included countries are at different points on their respective journeys toward reducing preventable maternal mortality and morbidity. In South Sudan, Somalia, and Ethiopia, access to emergency obstetric care remains especially challenging. Widespread insecurity and danger in South Sudan and Somalia created particular challenges for women experiencing obstetric complications, while Ethiopia's population is largely rural and spread across difficult terrain. Higher proportions of fistula after cesarean birth and gynecological surgery in Kenya, Malawi, Rwanda, Uganda, Tanzania, and Zambia signal potential progress in improving access to emergency obstetric care[5].

Unfortunately, access to care does not always prevent fistula or save the baby. Women may arrive late or experience delay within or between facilities. When we focused our analysis on women who developed fistula after giving birth in facilities, we found that 84.1% had delivered a stillborn baby[6]. Among these women with stillbirths, the cesarean section rate rose from 45% in 1990-94 to 64% in 2010-14. The increase occurred at the expense of assisted vaginal delivery, which declined

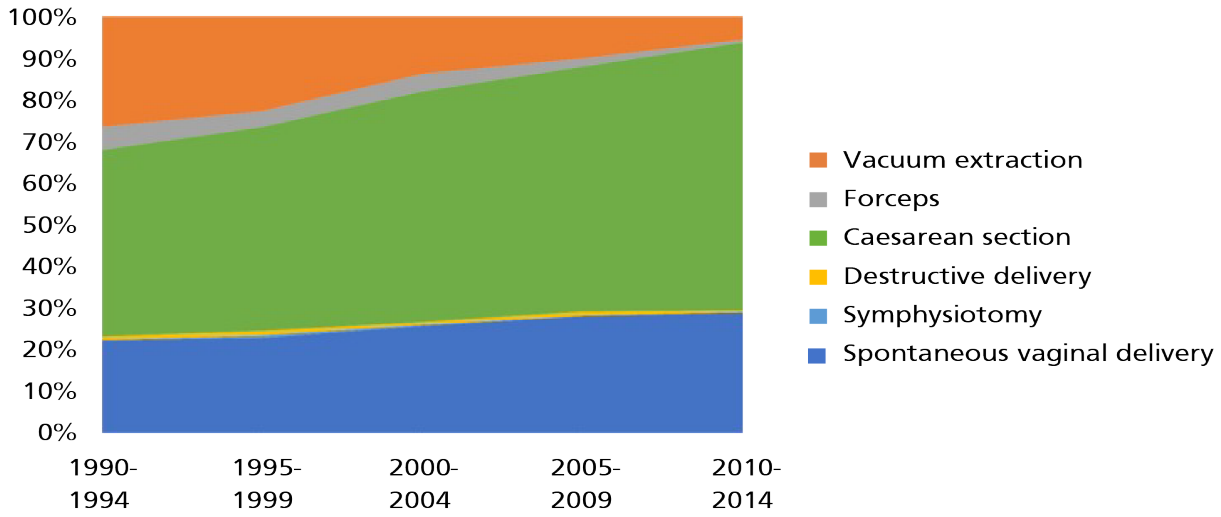


Figure 2 : Mode of delivery for prolonged, obstructed labours that resulted in obstetric fistula and stillbirth
Ngongo, C. J., Raassen, T. J. I., Lombard, L., van Roosmalen, J., Weyers, S., & Temmerman, M. (2020). Delivery mode for prolonged, obstructed labour resulting in obstetric fistula: A retrospective review of 4 396 women in East and Central Africa. BJOG: An International Journal of Obstetrics & Gynaecology, 127(6), 702-707. https://doi.org/10.1111/1471-0528.16047. Reproduced under the terms of the CC BY license.

from 32% to 6% (Figure 2)[6]. These data indicate that cesarean section is increasingly performed on women with obstructed labor whose fetuses have already died in utero. While our data could not capture fetal condition at the time of the decision for cesarean section, most cesarean sections were likely performed when the fetus was already dead. Cesarean section for a dead fetus can spread infection from the mother's uterus to her abdominal cavity and may cause severe peritonitis, sepsis, and maternal death. Unless uterine rupture is suspected, cesarean section should be avoided in these cases to minimize complications related to cesarean scars in subsequent pregnancies.

Sometimes a cesarean section itself leads to fistula formation. This topic enters into potential ambiguity: while fistula cause is apparent after vaginal birth or gynecological surgery, fistula cause can be less clear when a woman labored for quite a while before a cesarean birth. To help give some clarity, we proposed a categorization for understanding the likelihood of iatrogenic origin based on anatomical location and circumstances[7]. Shared definitions are important in assessing the epidemiological transition from ischemic to iatrogenic predominance in fistula surgical caseloads in Africa[1].

Applying the definitions, we assessed whether and how the proportion of iatrogenic urogenital fistula was changing over time among women with fistula, comparing women with iatrogenic fistulas to women with ischemic fistulas. We used mixed effects logistic regression to model the rise in iatrogenic fistula among births resulting in fistula and specifically among cesarean births resulting in fistula (Figure 3)[8].

We found that over one-quarter of women with fistula following cesarean birth had an injury caused by surgery rather than pressure necrosis due to prolonged, obstructed labor. Controlling for age, parity, and previous abdominal surgery, the odds of iatrogenic origin nearly doubled over time among all births resulting in fistula and rose by 37% among cesarean births resulting in fistula. In Kenya and Rwanda the rise of iatrogenic injury outpaced the increasing frequency of cesarean birth[8].

Rising numbers of iatrogenic fistulas signal a quality crisis in emergency obstetric care. Unaddressed, the impact of this problem will grow as cesarean births become more common. How can these learnings from women who developed fistula inform day-to-day practice?

Women experiencing obstetric complications should be able to quickly and safely access health facilities with staffing, equipment and infrastructure to provide high-quality basic and comprehensive emergency obstetric care. The seriousness of cesarean complications in resource-limited settings reinforces the importance of appropriate labor management and restrained decision-making around cesarean birth[9,10]. Cesarean birth should only be performed when health care providers anticipate a clear benefit that outweighs the additional risks and higher costs[11,12]. Rising cesarean birth rates mean more risks for surgical complications, such as the cases of iatrogenic fistula seen in this case series.

Alternatives to cesarean section can resolve prolonged labors with vaginal birth[13]. In the first stage, when labor becomes prolonged, artificial rupture of membranes and oxytocin augmentation can be used to accelerate prolonged labor[14]. In the second stage, vacuum extraction is a good option to pursue vaginal birth[13]. For women with obstructed labor and intrauterine fetal death, destructive delivery such as craniotomy should be the first method of choice if the obstruction makes vacuum or forceps delivery impossible[15].

Training programs, policies, and protocols should reinforce evidence-based guidelines for cesarean decision-making, such that cesareans are performed

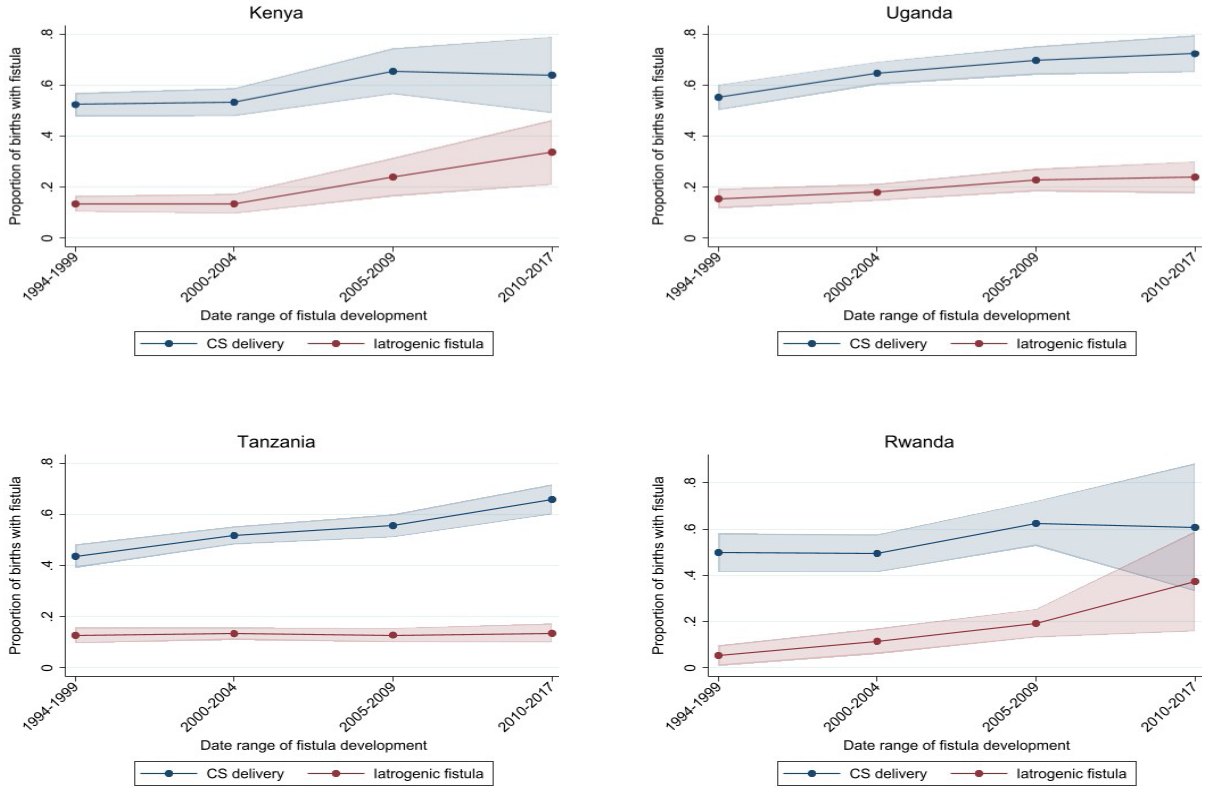


Figure 3: Rise in cesarean birth and iatrogenic injury among women with fistula.
Ngongo, C.J., Raassen, T.J.I.P., Mahendeka, M. et al. Iatrogenic genito-urinary fistula following cesarean birth in nine sub-Saharan African countries: a retrospective review. BMC Pregnancy Childbirth 22, 541 (2022). https://doi.org/10.1186/s12884-022-04774-0. Reproduced under the terms of the CC BY license.

only when indicated[16,17]. Medical professionals are most comfortable performing procedures that they have learned and practiced. Preventing genital fistula and other complications of obstructed labor requires health provider expertise with cesarean section and alternatives such as vacuum extraction, as well as clinical judgment to select the most appropriate mode of birth. While some African countries have stated requirements for interns to conduct a certain number of vaginal and cesarean births, others do not have clear requirements for licensure. Few countries require experience with vacuum birth, and significant gaps persist between training ideals and realities on the ground[13,18–20]. Hands-on vacuum extraction experience during training has been found to be strongly associated with subsequent practice in Tanzania[21]. Vacuum extraction is also being promoted in Uganda, where most women would recommend vacuum extraction over cesarean birth in case of prolonged second stage of labor[18].

Women with obstructed labor and dead fetuses generally present in remote facilities, far from specialty training in tertiary centers. Nevertheless, medical schools and other relevant clinician training programs must acknowledge the realities that many healthcare providers face. Without emphasis on vacuum extraction and destructive procedures during training, cesarean birth may seem to be the least potentially harmful option, even when not indicated.

The rise in iatrogenic fistulas communicates that simply increasing access to cesarean sections isn't enough; surgical quality must also improve. Providers who perform cesarean sections and gynecological surgeries may benefit from focusing on surgical techniques that minimize the risk of bladder and ureteric injury, particularly in complex cases[7,22]. Surgical safety checklists can be tailored for obstetric procedures to help prevent errors and ensure that all necessary steps are followed. Such effort to strengthen surgical safety and quality will be complemented by improvements in triage and referral, including training and mentorship on using the partograph to monitor labor progression, recognizing signs of prolonged, obstructed labor, and establishing and reinforcing efficient referral networks[23].

Quality improvement measures are needed to reduce iatrogenic injuries in obstetric surgery. This includes systems of mentoring, supervision, and accountability: mechanisms that foster a culture of quality service delivery while helping to hold healthcare providers responsible for providing the best possible level of care. Success in implementing effective maternal and perinatal audits, institutionalizing supportive supervision, and overcoming obstacles to quality improvement comes down to leadership. Proactive political leaders can transform commitments and promises into resources and actions that will reduce maternal morbidity and mortality[24]. Proactive healthcare provider leaders can take on the responsibility to influence others toward a

commitment to continuous quality improvement[23].

The occurrence of iatrogenic fistulas illustrates the importance of appropriate labor management and cesarean section decision-making, regardless of the provider cadre that attends the delivery. Many countries use task shifting to expand access to care, deploying non-physician associate clinicians who take on many of the diagnostic and clinical functions of doctors[25]. In Ethiopia, Ghana, Malawi, Mozambique, Sierra Leone, and Tanzania, associate clinicians carry out cesarean sections and other major obstetric surgeries[25,26]. Various reports have found cadre comparability in outcomes, risk indicators, and quality[27–29]. Similarly, in Tanzania and Malawi we reported no statistically significant difference in iatrogenic fistula risk based on whether the cesarean birth was attended by a physician or an associate clinician[30]. Given the noninferior performance and lower costs of employing associate clinicians, other countries with insufficient and/or unequally distributed health workforces could consider task-shifting cesarean sections to associate clinicians[30].

Policymakers and advocates have long emphasized access to care: women experiencing obstetric complications should be able to reach health facilities offering basic and comprehensive emergency obstetric care. Our work reveals important country-level differences in the characteristics of women who develop urogenital fistula. The emerging story is not simple lack of access to health care, but of both lack of access and quality of care. Although the majority of fistulas arise from pressure necrosis during prolonged, obstructed labor, fistula etiology is shifting as women gain access to care[1,31]. Cesarean birth is increasingly common among women who later present for fistula repair, including for women with stillbirths[6]. Among women with fistula following cesarean birth, over one-quarter have an injury apparently caused by surgery rather than prolonged, obstructed labor[8]. One might expect that the proportion of such iatrogenic fistulas would rise in tandem with the rising cesarean birth rate among women who developed fistula, but in some countries it's rising more quickly. Taken together, these data are a call to action: Women experiencing obstructed labor who increasingly reach facilities must receive timely, appropriate, and high-quality care. The experiences of women who developed fistula point to opportunities to improve healthcare services, helping future mothers to be spared their fate.

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