

## Factors associated with loss to follow-up in women undergoing repair for obstetric fistula in Guinea

Alexandre Delamou<sup>1,2,3</sup>, Thérèse Delvaux<sup>3</sup>, Bettina Utz<sup>3</sup>, Bienvenu Salim Camara<sup>2</sup>, Abdoul Habib Beavogui<sup>2</sup>, Bethany Cole<sup>5</sup>, Karen Levin<sup>5</sup>, Moustapha Diallo<sup>4</sup>, Sita Millimono<sup>4</sup>, Thierno Hamido Barry<sup>6</sup>, Alison Marie El Ayadi<sup>7</sup>, Wei-Hong Zhang<sup>1</sup> and Vincent De Brouwere<sup>3</sup>

<sup>1</sup> *Ecole de Santé Publique, Université Libre de Bruxelles (ULB), Bruxelles, Belgium*

<sup>2</sup> *Centre national de formation et de recherche en santé rurale de Maferinyah, Maferinyah, Guinea*

<sup>3</sup> *Department of Public Health, Institute of Tropical Medicine, Antwerp, Belgium*

<sup>4</sup> *EngenderHealth, Conakry, Guinea*

<sup>5</sup> *EngenderHealth, New York, NY, USA*

<sup>6</sup> *Hopital Prefectoral de Kissidougou, Kissidougou, Guinea*

<sup>7</sup> *Department of Obstetrics, Gynecology and Reproductive Sciences, University of California, San Francisco, CA, USA*

### Abstract

**OBJECTIVES** To analyse the trend of loss to follow-up over time and identify factors associated with women being lost to follow-up after discharge in three fistula repair hospitals in Guinea.

**METHODS** This retrospective cohort study used data extracted from medical records of fistula repairs conducted from 1 January 2007 to 30 September 2013. A woman was considered lost to follow-up if she did not return within 4 months post-discharge. Factors associated with loss to follow-up were identified using a subsample of the data covering the period 2010–2013.

**RESULTS** Over the study period, the proportion of loss to follow-up was 21.5% (448/2080) and varied across repair hospitals and over time with an increase from 2% in 2009 to 52% in 2013. After adjusting for other variables in a multivariate logistic regression model, women who underwent surgery at Labe hospital and at Kissidougou hospital were more likely to be lost to follow-up than women operated at Jean Paul II hospital (OR: 50.6; 95% CI: 24.9–102.8) and (OR: 11.5; 95% CI: 6.1–22.0), respectively. Women with their fistula closed at hospital discharge (OR: 3.2; 95% CI: 2.1–4.8) and women admitted for repair in years 2011–2013 showed higher loss to follow-up as compared to 2010. Finally, loss to follow-up increased by 2% for each additional kilometre of distance a client lived from the repair hospital (OR: 1.002; 95% CI: 1.001–1.003).

**CONCLUSION** Reimbursement of transport was the likely reason for change over time of LTFU. Reducing geographical barriers to care for women with fistula could sustain fistula care positive outcomes.

**keywords** Obstetric fistula, loss to follow-up, Guinea, Conakry, Fistula care

### Introduction

According to the recent estimates, the lifetime prevalence of obstetric fistula in women aged 15–49 years is 1.57 per 1000 in sub-Saharan Africa [1, 2]. In Guinea, 6 per 1000 of women of reproductive age carry the lifetime risk of experiencing obstetric fistula [3]. Although significant progress has been made in more than 50 countries in the prevention and management of obstetric fistula, significant gaps remain [4]. First, access to emergency obstetric care including skilled birth attendance in many countries in sub-Saharan Africa is still low [5]. Second, despite high fistula closure rates (80–90%) observed after surgery [6, 7], studies in sub-Saharan Africa have

reported late repair breakdown ranging from 2.6% to 4.3% between 6 and 24 months after discharge from hospital [8–10]. Third, the loss to follow-up rates for women discharged after repair can be high [8, 11].

Data on the post-repair period in fistula programmes are scarce, but in the literature, the young maternal age, low maternal level of education, housewife/unemployed mothers, transportation costs related to long distances to the hospital and inadequate counselling at facilities are often reported to be associated with LTFU in maternal health programmes in developing countries [12, 13].

There is no standard prescribed time period for follow-up after fistula repair. However, a routine post-operative visit at 3–6 months is usually reported [8, 11, 14, 15].

Bishinga *et al.* reported 40% and 80% loss to follow-up at 3 and 6 months, respectively, among 479 women repaired for fistula at the Medecins Sans Frontieres (MSF) supported Gitega Fistula Centre in Burundi, and Browning *et al.* reported 40% loss to follow-up among 390 women at 6 months post-repair at the Bahir Dar Hamlin Fistula Centre in Ethiopia [8, 11]. In Burundi, the authors could not examine all the factors associated with loss to follow-up because of limited available information. In Ethiopia, the authors underlined the importance of monitoring late breakdown and emphasised the need for reinforcing follow-up after repair to sustain long-term outcomes for programmes [8, 16].

Previous reports show that repair breakdown can occur after discharge [9, 10] or, conversely, that incontinence may either improve or resolve after discharge [8]. Therefore, from a programme perspective, the 3 months follow-up visit provides useful information about the dynamic of repair outcomes over time [11], while from the woman's perspective, it is an opportunity for the doctor to confirm the closure/continence status and release her to resume daily activities including sexual relations, as it is routine practice in many fistula repair programmes to advise women not to perform heavy work or resume sexual relations for 3 months post-op [15]. Furthermore, if the repair has broken down, the visit is an opportunity to provide continued care to the woman and can identify her current needs. Following up women after repair is essential to better understand their reintegration process, their health status including any persistent urinary symptoms and their quality of life in the post-repair period [9, 17]. Therefore, understanding the predictors of loss to follow-up is important for optimising care.

In 2007, EngenderHealth (an international reproductive health non-governmental organisation) helped to establish and strengthen fistula management services at three hospitals in Guinea through the Fistula Care project [18]. An evaluation of the repair outcomes from these facilities was published in a previous paper [19]. In this study, our objective was to analyse the trend of loss to follow-up over time and identify factors associated with women being lost to follow-up after discharge in three fistula repair hospitals in Guinea.

## Methods

### Study design

This was a retrospective cohort study using data extracted from medical records of all fistula repairs conducted from 1 January 2007 to 30 September 2013 at three hospitals in Guinea.

### Setting

Guinea is among the poorest countries in the world with the majority (65%) of its 12 million inhabitants living in rural areas and a maternal mortality ratio of 724 per 100 000 live births [3]. The maternity units of three urban hospitals in three regions of Guinea (Jean Paul II Hospital in Conakry, the Regional Hospital of Labé and the Prefectural Hospital of Kissidougou) where obstetric fistula repair was supported by the Fistula Care Project. Each three hospitals were staffed by two or three surgeons, an anaesthetist, a counsellor and two to four nurses all trained in fistula prevention and management. They collectively performed on average 300–400 fistula surgical repair per year. Treatment in these hospitals was free and included assessment and surgical repair by a surgeon, and counselling about exercises, family planning methods, and restrictions on sexual intercourse and heavy labour up to 3 months post-repair [19].

### Study population and participants

We included all women originating from Guinea ( $N = 2080$ ) who underwent fistula repair in each of the three hospitals between 1 January 2007 and 30 September 2013. Women coming from outside Guinea (36 women, 1.7% of the total sample) were excluded from this study because they were originally given financial support for residence in nearby facility-sponsored social houses and could therefore bias the results.

### Data and key indicators

The socio-demographic and clinical characteristics of fistula patients available from patient records included the following: age at admission at hospital (in years), marital status (single, married, divorced or widow), residence (rural or urban), woman's occupation (housewife or worker – defined as working for pay), level of education (none versus primary or higher), duration of fistula (in years), place of delivery (home, home with traditional birth attendant and health structure), neonatal outcome (alive and stillborn), mode of delivery (vaginal and Caesarean section), type of obstetric fistula (vesicovaginal fistula – VVF, rectovaginal fistula – RVF, and both – VVF + RVF), previous repairs, residential distance from the repair centre and year of surgery (2007 to 2013).

Treatment outcomes were fistula closure (Yes or No) continence status after surgery at hospital discharge (Yes or No), assessed by a dye test prior to hospital discharge. Loss to follow-up (LTFU), defined as the woman failing to return for a follow-up visit within 4 months after

A. Delamou *et al.* **Fistula: loss to follow-up in Guinea**

being discharged, was recorded as a dichotomous variable (Yes or No). Study data were abstracted from patients' files kept at each fistula care repair hospital by two members of the study team, using structured forms. Data were extracted from medical records between 1 April and 31 August 2014 and covered 69 months, from 1 January 2007 to 30 September 2013.

### Data analysis

Data collected from patients' files were double-entered by two independent encoders into EpiData software (EpiData Association, Odense, Denmark). The two data files were compared and discordances resolved by cross-checking with the paper registers. Data were analysed using STATA 13 software (STATA Corporation, College Station, TX, USA). We used the whole sample ( $N = 2080$ ) to summarise demographic and clinical characteristics, treatment outcomes and LTFU using frequencies (%) and means (with standard deviation). Because essentially in the early years, there was no variation of LTFU to examine, we considered the subsample of women operated from 2010 to 2013 at the three repair hospitals for the bivariate and multivariate analyses. Pearson's chi-square test ( $\chi^2$ ) or Student's *t*-test were used, respectively, to compare proportions or means of variables between women lost to follow-up and those not lost to follow-up with a level of significance set at  $P = 0.05$  and a 95% confidence interval. A logistic regression model was used to derive the unadjusted and adjusted odds ratios. The significance level was set at 5% with a 95% confidence interval. All study variables were considered *a priori* for inclusion in the logistic regression model looking at factors associated with LTFU. The adequacy of the final model was tested by the Hosmer and Lemeshow test for goodness of fit.

### Ethics approvals

Ethics approval was obtained from the Guinean National Ethics Committee for Health Research and the Scientific Committee of the Department of Public Health of the Faculty of Medicine of the University of Conakry.

## Results

### Sociodemographic and clinical characteristics

Overall, 2080 women originating from Guinea underwent surgical repair for female genital fistula at the three repair hospitals. Table 1 shows the demographic and clinical characteristics of these women. More than

half of the repairs (1083, 52%) were done at Kissidougou hospital. The mean age at presentation was  $34 \pm 12$  years. The majority of women ( $n = 1413$ , 69%) were married or in union, had no level of education (1865, 94%) and had vesicovaginal fistula (2011, 98%). Only 5% (101 women) had a livebirth for the referent pregnancy.

### Loss to follow-up

Of the 2080 women repaired between 2007 and 2013, 448 women were reported LTFU (21.5%, 95% CI, 19.8–23.3). There was little variation in the overall proportion of LTFU in the early years of the Fistula Care Project (2007–2009), while this proportion varied drastically between repair hospitals and over time, increasing from 2% in 2009 to 52% in 2013 (Figure 1).

### Bivariate analyses

In bivariate analyses, the demographic and clinical characteristics of women LTFU were similar to those were not LTFU (1632 women) at presentation. LTFU was significantly associated with repair hospital, age of the woman at admission, duration of fistula, level of education, place of delivery, continence status at discharge and year of surgery (Table 2).

Women operated at Labe hospital (odds ratio (OR): 13.2; 95% confidence interval (95% CI): 8.8–19.7) and Kissidougou hospital (OR: 4.9; 95% CI: 3.3–7.3) were more likely to be lost to follow-up than women operated at Jean Paul II hospital. The odds of LTFU increased by 1% for each additional year of age at presentation (OR: 1.01; 95% CI: 1.00–1.01) and 2% for each additional year of duration of fistula (OR: 1.02; 95% CI: 1.00–1.03). The odds of LTFU were higher among women with no education (OR: 2.4; 95% CI: 1.3–4.4), and those giving birth at home (OR: 1.7; 95% CI: 1.1–2.6). Women not continent at discharge (OR: 1.8; 95% CI: 1.4–2.4) and those admitted for surgery from 2011 to 2013 (OR: 2.8; 95% CI: 2.0–3.9), (OR: 2.2; 95% CI: 1.5–3.1) and (OR: 6.4; 95% CI: 4.4–9.4), respectively, were more likely to be lost to follow-up than those in 2010.

### Multivariable analysis

After adjusting for possible confounding factors (Table 2), LTFU status remained significantly associated with repair hospital, continence status at discharge and year of surgery. Distance between the repair hospital and a woman's residence became significant after adjusting for other variables.

A. Delamou *et al.* **Fistula: loss to follow-up in Guinea****Table 1** Demographic and clinical characteristics of Guinean women undergoing repair for obstetric fistula in three hospitals from 2007 to 2013 in Guinea (*N* = 2080)

Variables	Mean (SD) or Median (IQR)	Number (%)
Total		2080
Repair hospital		
Jean Paul II hospital		549 (26.4)
Labé hospital		448 (21.5)
Kissidougou hospital		1083 (52.1)
Mean age at reception (SD), years	34.2 (12.3)	
Residence		
Rural		1890 (91.2)
Urban		182 (8.8)
Mean number of previous repairs (SD)	0.63 (0.88)	
Mean duration of fistula (SD), years	9.9 (9.0)	
Marital status		
Single		79 (3.8)
Married/Union		1413 (68.7)
Divorced/Separated		375 (18.2)
Widow		189 (9.2)
Occupation		
Housewife		1991 (96.9)
Worker		64 (3.1)
Level of education		
None		1865 (94.1)
Primary & higher		118 (5.9)
Mean parity (SD)	3.5 (2.5)	
Place of delivery		
Home		463 (22.8)
Home with traditional birth attendants (TBA)		217 (10.7)
Health structure		1354 (66.5)
Neonatal outcome		
Alive		101 (4.9)
Stillborn		1944 (95.1)
Mode of causal delivery		
Vaginal		1353 (66.3)
Caesarean section		687 (33.7)
Type of obstetric fistula		
Vesicovaginal fistula (VVF)		2011 (96.7)
Rectovaginal fistula (RVF)		23 (1.1)
VVF + RVF		46 (2.2)
Fistula status after surgery		
Closed		1726 (89.5)
Not closed		203 (10.5)
Continence status at discharge		
Continent		1653 (79.6)
Not continent		423 (20.4)
Year of surgery		
2007		178 (8.6)
2008		181 (8.7)
2009		246 (11.9)

**Table 1** (Continued)

Variables	Mean (SD) or Median (IQR)	Number (%)
2010		381 (18.4)
2011		493 (23.8)
2012		369 (17.8)
2013		227 (10.9)
Mean distance from repair hospital (SD), km	260.7 (180.5)	

SD, Standard deviation.

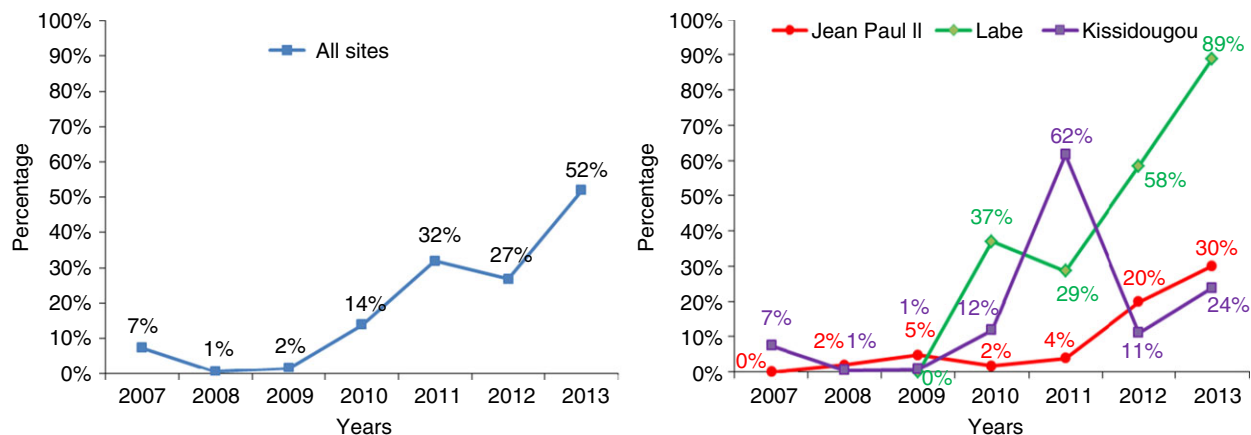
Women who underwent surgery at Labe hospital and at Kissidougou hospital were more likely to be LTFU than women operated on at Jean Paul II hospital (OR: 50.6; 95% CI: 24.9–102.8) and (OR: 11.5; 95% CI: 6.1–22.0), respectively.

The odds of LTFU was higher among women with their fistula closed at hospital discharge (OR: 3.2; 95% CI: 2.1–4.8) and women admitted in 2011 (OR: 3.2; 95% CI: 2.0–4.9), in 2012 (OR: 1.9; 95% CI: 1.2–3.1) and 2013 (OR: 5.3; 95% CI: 3.2–8.5). Finally, the odds of LTFU increased by 2% for each additional km of distance a woman lived from the repair hospital (OR: 1.002; 95% CI: 1.001–1.003).

## Discussion

This study provides an overview of the factors associated with loss to follow-up after discharge of women undergoing obstetric fistula repair in Guinea. About 22% of women who underwent repair for obstetric fistula between 2007 and 2013 were LTFU.

We found that LTFU significantly varied between repair hospitals and over time from 2010. In addition, year of surgery was associated with being LTFU in both bivariate and multivariate analyses. The main reason for this might be the reimbursement in cash of transportation costs to women during the early years of the Fistula Care Project (2007–2009). In 2010, this policy was changed and women were just counselled and encouraged to return at their own expense. However, Kissidougou Hospital was involved in a cohort study from September 2007 to September 2010 [14] and in a clinical trial in 2012 [20, 21]. In 2012, the hospital continued to provide transportation as well as gifts for women enrolled in the trial and returning for their follow-up visit, leading to a decrease in LTFU from 62% in 2011 to 11% in 2012 (Figure 1). Direct provision of resources such as cash reimbursement of transportation costs might improve the

A. Delamou *et al.* **Fistula: loss to follow-up in Guinea**

**Figure 1** Annual trend in the proportions of loss to follow-up among women undergoing surgical repair for obstetric fistula in three repair hospitals in Guinea, 2007 to 2013.

outcomes of fistula programmes, particularly those including social reintegration and long-term follow-up after repair.

We found that women who underwent surgery at Labe hospital and at Kissidougou hospital were more likely to be lost to follow-up than women operated at Jean Paul II hospital. One reason for this might be the geographical distribution of clients. Jean Paul II hospital is located in the capital city Conakry where transportation to and from surrounding localities is easy and cheap, allowing more women to come back for their follow-up visit. In contrast, Labe hospital (Middle Guinea) and Kissidougou hospital (Forest Guinea) are located in mountainous regions where the repair hospitals are far and not always easily accessible by women coming from remote areas. Another reason might be the way counselling sessions prior to discharge were conducted across repair hospitals might have differed (for instance the interaction between clients and providers). The odds of LTFU increased by 13% for each additional 50 km of distance a client lived from the repair hospital, suggesting that women living further away from repair hospitals were more likely to miss their follow-up visits. Distance to repair site has already been identified as a barrier to access to fistula care by Bishinga *et al.* [11] and Browning *et al.* [8] who reported high loss to follow-up at 3 and 6 months post-repair, respectively, in Burundi and Ethiopia, even in a context where transportation costs were reimbursed. As distance to facilities is an issue for access even in the presence of cost reimbursement [11], one possible solution would be to implement some type of post-discharge fistula care by providing decentralised follow-up through training and involvement of medical teams of district hos-

pitals and even health centres [22]. The use of mobile phones for follow-up could also yield good results, such as in Tanzania where the use of mobile phone technology to transfer funds to cover transport costs for fistula patients increased access to fistula care by 49% [23]. Community-based follow-up has also been suggested as a means to increase follow-up rates [9] and sustain good outcomes at discharge in many studies [6, 19, 24, 25].

In our context, there is a need to improve the coordination mechanism between repair hospitals to ensure every woman suffering from fistula is referred to the nearest repair hospital. The mean distance between a woman's residence and repair hospital observed in this study ( $261 \pm 181$  km) shows that many women were repaired far from their residence because repairs were planned in periodic repair sessions. Some women were sent from one repair hospital to another, depending on the availability of the surgery team.

Women who were successfully closed and dry at discharge (continent) were less likely to return for their 3 months follow-up visit. Previous studies have reported higher closure and continence rates in women with relatively simple and recently occurred fistula [24, 25]. This suggests that women with more complex fistula might give up their search for care and decide not to return for follow-up. These women are probably demoralised after years of living with their fistula and suffering of intractable social exclusion [26, 27]. However, Browning *et al.* [8] have reported from Ethiopia that 96.1% of those who returned for follow-up after 6 months were not completely healed at the time of discharge (including women with residual incontinence), while only 49.1% of those who were healed at discharge returned. Possible



A. Delamou *et al.* **Fistula: loss to follow-up in Guinea****Table 2** Logistic regression identifying factors associated with being lost to follow-up among women who have undergone fistula repair in three repair hospitals from 2010 to 2013 in Guinea (*N* = 1475)

Variables	Women LTFU N (%)	Bivariate analysis Unadjusted OR (95% CI)	Multivariate analysis Adjusted* OR (95% CI)
Total	1475	1475	1390
Repair hospital			
Jean Paul II hospital	33 (7.7)	1	1
Labé hospital	214 (52.2)	<b>13.17 (8.79–19.73)</b>	<b>50.6 (24.86–102.98)</b>
Kissidougou hospital	183 (28.9)	<b>4.89 (3.30–7.26)</b>	<b>11.55 (6.07–22.00)</b>
Age at reception, years	36.1 (12.4)	<b>1.01 (1.00–1.02)</b>	1.00 (0.98–1.01)
Residence			
Rural	398 (29.0)	1	1
Urban	32 (32.3)	1.17 (0.75–1.81)	1.02 (0.54–1.95)
Number of previous repairs	0.65 (0.9)	1.05 (0.93–1.20)	1.05 (0.88–1.25)
Duration of fistula, years	10.8 (8.9)	<b>1.02 (1.00–1.03)</b>	1.00 (0.97–1.02)
Marital status			
Single	11 (22.0)	1	1
Married/Union	292 (28.2)	1.39 (0.70–2.76)	0.75 (0.32–1.73)
Divorced/Separated	67 (29.8)	1.50 (0.73–3.11)	0.77 (0.32–1.87)
Widow	53 (35.8)	1.98 (0.94–4.18)	0.89 (0.34–2.34)
Occupation			
Housewife	415 (29.4)	1.82 (0.84–3.96)	0.62 (0.24–1.62)
Worker	8 (18.6)	1	1
Level of education			
None	400 (30.6)	<b>2.41 (1.32–4.41)</b>	0.64 (0.36–1.14)
Primary & higher	13 (15.5)	1	1
Parity	3.8 (2.5)	1.01 (0.97–1.06)	0.98 (0.95–1.02)
Place of delivery			
Home	117 (32.7)	<b>1.68 (1.09–2.60)</b>	1.36 (0.77–2.40)
Home with TBA	35 (22.4)	1	1
Health structure	268 (29.1)	1.42 (0.95–2.12)	1.16 (0.67–2.01)
Neonatal outcome			
Alive	30 (36.6)	1.44 (0.90–2.29)	1.30 (0.71–2.37)
Stillborn	390 (28.6)	1	1
Mode of causal delivery			
Vaginal	276 (28.8)	1	1
Caesarean section	143 (29.7)	1.05 (0.82–1.33)	1.06 (0.73–1.55)
Type of obstetric fistula			
Vesicovaginal fistula (VVF)	415 (29.2)	1.97 (0.55–6.74)	1.66 (0.40–6.82)
Rectovaginal fistula (RVF)	3 (17.7)	1	1
VVF + RVF	12 (31.6)	2.15 (0.52–8.93)	1.36 (0.26–7.07)
Continence status at discharge			
Continent	322 (26.7)	1	1
Not continent	106 (39.7)	<b>1.81 (1.37–2.38)</b>	<b>3.20 (2.15–4.79)</b>
Year of surgery			
2010	55 (14.4)	1	1
2011	158 (32.1)	<b>2.80 (1.98–3.94)</b>	<b>3.17 (2.04–4.92)</b>
2012	99 (26.8)	<b>2.17 (1.51–3.14)</b>	<b>1.95 (1.23–3.11)</b>
2013	118 (52.0)	<b>6.42 (4.36–9.44)</b>	<b>5.26 (3.24–8.52)</b>
Distance from repair hospital (km)	249.6 (178.6)	0.98 (0.942–1.010)	<b>1.002 (1.001–1.003)</b>

OR, Odds ratios; CI, Confidence interval; LTFU, Loss to follow-up.

Hosmer–Lemeshow test for goodness-of-fit:  $\chi^2$  (8 d.f.) = 9.80; *P* = 0.28.

\*Multivariate analysis adjusting for possible confounding factors. Bold figures show significant confidence intervals.

A. Delamou *et al.* **Fistula: loss to follow-up in Guinea**

explanations they provided were that (i) women who were cured at discharge were more likely to reintegrate into a normal social life, resume sexual intercourse and become pregnant again in the short term; and/or (ii) they do not feel it is important to attend the follow-up because they consider themselves cured [8, 16].

The main limitation of this study was that it was based on data from medical records only, and no additional qualitative data were collected on why women did not return for follow-up. For women who did not return, we were unable to establish their closure and continence status at 3 months post-op nor were we able to evaluate their mental health status. Poorer mental health has been reported to be present in women with poorer acute outcomes [8]. Finally, we were unable to characterise the sample in relation to all women who have experienced fistula, or to the average woman in Guinea (for instance using Demographic and Health Survey data). However, this is one of the few studies to examine factors associated with loss to follow-up in women undergoing repair for obstetric fistula in low income countries using such a large dataset.

### Conclusion

This study shows that repair hospital, fistula status at discharge, year of surgery and distance from repair hospital were the main factors associated with loss to follow-up status post-discharge in women repaired for obstetric fistula in Guinea. Providing resources to reduce geographical and financial barriers (in particular transportation costs) for women suffering from fistula, improving pre-discharge counselling and implementing active follow-up strategies could reduce LTFU and improve fistula programme performance. More mixed methods research, both qualitative and quantitative, is needed to trace women who are lost to follow-up to understand patients' reasons and motivations for not returning for follow-up visits and the cultural and family dynamics that influence these decisions.

### Acknowledgements

We thank and dedicate this paper to Karen Beattie, former Director of the Fistula Care project, for her outstanding and inspiring leadership during her 22 years of dedication to improving the lives of women suffering from fistula and other reproductive health issues in Guinea and in low income countries. Fistula Care was managed by EngenderHealth and funded by the U.S. Agency for International Development (USAID). Views expressed here do not necessarily reflect those of USAID, Engen-

derHealth or the Institute of Tropical Medicine of Antwerp (ITM).

### References

1. Adler AJ, Ronsmans C, Calvert C, Filippi V. Estimating the prevalence of obstetric fistula: a systematic review and meta-analysis. *BMC Pregnancy Childbirth* 2013; **13**: 246.
2. Osotimehin B. Obstetric fistula: ending the health and human rights tragedy. *Lancet* 2013; **381**: 1702–1703.
3. Institut National des Statistiques, Guinea. *Enquete Demographique et de sante - Etude a indicateurs multiples (EDS-MICS), Guinee 2012*. Macro Int.: Conakry: INS, 2014.
4. Peterman A, Johnson K. Facility-level services for obstetric fistula repair in Africa. *Int J Gynaecol Obstet* 2015; **128**: 77–79.
5. Lozano R, Wang H, Foreman K *et al.* Progress towards Millennium Development Goals 4 and 5 on maternal and child mortality: an updated systematic analysis. *Lancet* 2011; **378**: 1139–1165.
6. Tayler-Smith K, Zachariah R, Manzi M *et al.* Obstetric Fistula in Burundi: a comprehensive approach to managing women with this neglected disease. *BMC Pregnancy Childbirth* 2013; **13**: 164.
7. Hawkins L, Spitzer RF, Christoffersen-Deb A, Leah J, Mabeya H. Characteristics and surgical success of patients presenting for repair of obstetric fistula in western Kenya. *Int J Gynaecol Obstet* 2013; **120**: 178–182.
8. Browning A, Menber B. Women with obstetric fistula in Ethiopia: a 6-month follow up after surgical treatment. *BJOG* 2008; **115**: 1564–1569.
9. Nielsen HS, Lindberg L, Nygaard U *et al.* A community-based long-term follow up of women undergoing obstetric fistula repair in rural Ethiopia. *BJOG* 2009; **116**: 1258–1264.
10. Wilson AL, Chipeta E, Kalilani-Phiri L, Taulo F, Tsui AO. Fertility and pregnancy outcomes among women with obstetric fistula in rural Malawi. *Int J Gynaecol Obstet* 2011; **113**: 196–198.
11. Bishinga A, Zachariah R, Hinderaker S *et al.* High loss to follow-up following obstetric fistula repair surgery in rural Burundi: is there a way forward? *Public Health Action* 2013; **3**: 113–117.
12. Sidze LK, Faye A, Tetang SN *et al.* Different factors associated with loss to follow-up of infants born to HIV-infected or uninfected mothers: observations from the ANRS 12140-PEDIACAM study in Cameroon. *BMC Public Health* 2015; **15**: 228.
13. Lubega M, Musenze IA, Joshua G *et al.* Sex inequality, high transport costs, and exposed clinic location: reasons for loss to follow-up of clients under prevention of mother-to-child HIV transmission in eastern Uganda - a qualitative study. *Patient Prefer Adherence* 2013; **7**: 447–454.
14. Barone MA, Frajzyngier V, Ruminjo J *et al.* Determinants of postoperative outcomes of female genital fistula repair surgery. *Obstet Gynecol* 2012; **120**: 524–531.

A. Delamou *et al.* **Fistula: loss to follow-up in Guinea**

15. Arrowsmith SD, Ruminjo J, Landry EG. Current practices in treatment of female genital fistula: a cross sectional study. *BMC Pregnancy Childbirth* 2010; **10**: 73.
16. Maulet N, Keita M, Macq J. Medico-social pathways of obstetric fistula patients in Mali and Niger: an 18-month cohort follow-up. *Trop Med Int Health* 2013; **18**: 524–533.
17. De Ridder D, Abubacar K & Raassen T *et al.*, eds. *Obstetric Fistula in the Developing World*. Societe Internationale d'Urologie (SIU): Montreal (QB), 2012; 87–122.
18. Fistula Care. *Project Report: October 2007 to December 2013, Part 1: Country Accomplishments*. Fistula Care/EngenderHealth: New York, 2013.
19. Delamou A, Diallo M, Beavogui AH *et al.* Good clinical outcomes from a 7-year holistic programme of fistula repair in Guinea. *Trop Med Int Health*. 2015; **20**: 813–819.
20. Barone M, Frajzyngier V, Arrowsmith SD *et al.* Non-inferiority of short-term urethral catheterization following fistula repair surgery: study protocol for a randomized controlled trial. *BMC Pregnancy Childbirth* 2012;**12**:5. doi: 10.1186/1472-6874-12-5.
21. Barone MA, Widmer M, Arrowsmith S *et al.* Breakdown of simple female genital fistula repair after 7 day versus 14 day postoperative bladder catheterisation: a randomised, controlled, open-label, non-inferiority trial. *Lancet*. 2015. pii: S0140-6736(14)62337-0. doi: 10.1016/S0140-6736(14)62337-0
22. Mattison C, Fiorentino R. *Strengthening Health Systems through the Levels of Fistula Care Framework – A Literature Review*. Fistula Care/EngenderHealth: New York, 2011.
23. Fiander A, Ndahani C, Mmuya K, Vanneste T. Results from 2011 for the transportMYpatient program for overcoming transport costs among women seeking treatment for obstetric fistula in Tanzania. *Int J Gynaecol Obstet* 2013; **120**: 292–295.
24. Kayondo M, Wasswa S, Kabakyenga J *et al.* Predictors and outcome of surgical repair of obstetric fistula at a regional referral hospital, Mbarara, western Uganda. *BMC Urol* 2011; **11**: 23.
25. Hawkins L, Spitzer RF, Christoffersen-Deb A, Leah J, Mabeya H. Characteristics and surgical success of patients presenting for repair of obstetric fistula in western Kenya. *Int J Gynaecol Obstet* 2013; **120**: 178–182.
26. Yeakey MP, Chipeta E, Taulo F, Tsui AO. The lived experience of Malawian women with obstetric fistula. *Cult Health Sex* 2009; **11**: 499–513.
27. Mselle LT, Moland KM, Evjen-Olsen B, Mvungi A & Kohi TW. “I am nothing”: experiences of loss among women suffering from severe birth injuries in Tanzania. *BMC Womens Health* 2011;**11**:49. doi: 10.1186/1472-6874-11-49.

**Corresponding Author** Alexandre Delamou, Centre national de formation et de recherche en santé rurale de Maferinyah, PO Box: 4099 Conakry, Guinea. Tel.: +22 46 310 99 750; E-mail: adelamou@gmail.com