



Characteristics and mortality of neonates in an emergency obstetric and neonatal care facility, rural Burundi

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Setting: A Médecins Sans Frontières emergency obstetric and neonatal care facility specialising as a referral centre for three districts for women with complications during pregnancy or delivery in rural Burundi.

Objective: To describe the characteristics and in-facility mortality rates of neonates born in 2011.

Design: Descriptive study involving a retrospective review of routinely collected facility data.

Results: Of 2285 women who delivered, the main complications were prolonged labour 331 (14%), arrested labour 238 (10%), previous uterine intervention 203 (9%), breech 171 (8%) and multiple gestations 150 (7%). There were 175 stillbirths and 2110 live neonates, of whom 515 (24%) were of low birth weight, 963 (46%) were delivered through caesarean section and 267 (13%) required active birth resuscitation. Overall, there were 102 (5%) neonatal deaths. A total of 453 (21%) neonates were admitted to dedicated neonatal special services for sick and low birth weight babies. A high proportion of these neonates were delivered by caesarean section and needed active birth resuscitation. Of 67 (15%) neonatal deaths in special services, 85% were due to conditions linked to low birth weight and birth asphyxia.

Conclusion: Among neonates born to women with complications during pregnancy or delivery, in-facility deaths due to low birth weight and birth asphyxia were considerable. Sustained attention is needed to reduce these mortality rates.

While maternal and under-five mortality rates in resource-poor countries have decreased significantly in the past three decades, neonatal mortality rates have fallen more slowly.¹ Neonatal mortality is a leading contributor to under-five mortality, accounting for 40% of all deaths, despite the fact that only 5% of under-fives are neonates (aged 0–28 days).² In resource-limited settings, neonates receive little programmatic attention, even though successful, low-cost interventions addressing their needs have been described.^{3–5} In sub-Saharan Africa, where neonatal mortality rates are highest, the Millennium Development Goal 4 (MDG4) of reducing childhood mortality by two thirds of the 1990 rate by 2015 will not be met unless substantial progress is made in reducing neonatal mortality.^{4,6}

There is little published information on overall and cause-specific mortality for neonates admitted to hospital, particularly in sub-Saharan Africa.^{7–9} In particular, we were unable to identify any publications on

hospital mortality for neonates born to women with complications during pregnancy or delivery. This represents an important knowledge gap, because neonates in these circumstances may have an increased mortality risk.

The aim of this study was to describe the characteristics and in-facility mortality rates of neonates born to mothers with (or at risk of) obstetric complications in a Médecins Sans Frontières emergency obstetric and neonatal care (EmONC) facility in rural Burundi, Africa.

METHODS

Design

This was a descriptive study involving a retrospective review of routinely collected facility data.

Setting

General setting

Burundi is a small, resource-limited country in eastern Africa with a population of 8 million, of whom 14% are children aged <5 years.¹⁰ Population figures on neonates are not available. Maternal mortality is among the highest in the world, with a mortality ratio of 800 per 100 000 live births.¹¹ Moreover, the neonatal mortality rate is reported at 42/1000 live births and neonates account for 31% of under-five deaths.¹⁰ Birth care, caesarean sections and care for under-fives are provided free of charge by the public health system, although the system suffers from poor funding, insufficient numbers of qualified health staff and a weakened health infrastructure following the 1993–2004 civil conflict.

Study site

The study data were collected from the Centre d'Urgences Gynéco-Obstétrique (CURGO) referral centre, an EmONC facility associated with a district hospital in Bujumbura Rural Province, serving a population of 458 000 from three districts (Kabezi, Isale and Rwibaga). The specific setup of CURGO is documented in detail elsewhere.¹² Briefly, CURGO, while part of a district hospital, is located on a separate plot of land, and provides emergency care for women with or at risk of obstetric complications. The district hospital and primary health care centres provide care for normal deliveries, and all women admitted to CURGO are thus referrals. Likewise, the only neonates admitted to CURGO are born either at the centre or during the ambulance transfer/call time. Neonates born outside CURGO or who develop complications after discharge

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from the centre are not admitted here, but are instead admitted to the district hospital or referred to neonatal units in the capital. Data on these children were not available.

CURGO's delivery room and main operating theatre are equipped with a neonatal resuscitation area, where radiant warming and active resuscitation (bag and mask ventilation with or without oxygen, cardiac massage and resuscitation drugs) can be provided. Trained midwives perform immediate care at birth, including drying, warming, cutting the cord and performing resuscitation when necessary. They also assess Apgar scores and the neonate's postnatal condition. Neonates who are delivered without complications receive routine preventive care, including vaccinations, cord care and eye care, and mothers receive breastfeeding counselling.

In the maternity ward, trained nurses follow neonates (with daily temperature and weight monitoring) until maternal discharge. Neonates who are born with complications or develop complications in the maternity ward receive dedicated neonatal special services (Table 1) in addition to routine preventive care: sick neonates with danger signs or a presumed diagnosis of neonatal sepsis, birth asphyxia or congenital malformations are admitted to the neonatology ward. Non-sick, low birth weight (LBW)

TABLE 1 Special neonatal services provided at the district hospital, Bujumbura*

Neonatology ward†	KMC ward
Care for sick neonates, regardless of weight and non-sick LBW neonates <1250 g until stabilisation‡	Care for non-sick LBW neonates
10 beds, increased to 17 by the end of 2011	5 beds
Daytime staff: 2 dedicated nurses; 2 lactation assistants (shared); 1 doctor (shared)	Daytime staff: 1 dedicated nurse; 2 lactation assistants (shared); 1 doctor (shared)
Nighttime staff: 2 dedicated nurses; 1 doctor on call (shared)	Nighttime staff: no dedicated staff; nurse from neonatology ward covers the KMC ward; 1 doctor on call (shared)
MSF clinical protocols	MSF clinical protocols
Basic warming equipment (heating mattresses since June 2011)	Skin-to-skin care
Oxygen concentrators	Breastfeeding support Nasogastric tube feeding or alternative feeding techniques if needed
Intravenous fluids	Bedside monitoring of blood glucose, weight and temperature
Intravenous antibiotics (ampicillin, gentamicin, cefotaxime, cloxacillin, metronidazole)	Oral caffeine (to prevent apnoea of prematurity)
Nasogastric tube feeding if needed	
Bedside monitoring of blood glucose, haemoglobin, and oxygen saturation	
Blood transfusion	

*A laboratory at CURGO performs basic tests (i.e., white blood cell count, malaria microscopy). Culture, bilirubin, C-reactive protein, blood gases and electrolytes are not performed.

†Services not available in the neonatology ward included blood culture, mechanical ventilation, phototherapy, incubators and on-site surgical and radiology facilities.

‡Neonates with birth weight <1250 g were cared for in the neonatology ward until stabilisation, as they usually required intravenous fluids, intravenous medications and possibly oxygen initially. These were not available in the KMC ward. KMC = kangaroo mother care; LBW = low birth weight; CURGO = Centre d'Urgences Gynéco-Obstétrique.

neonates, especially those <2000 g, needing support with feeding, control of blood sugar and extra warmth are admitted to the kangaroo mother care¹³ ward. If the neonate's birth condition is too severe (i.e., extremely low Apgar scores, not responding to resuscitation), he/she receives supportive care (i.e., oxygen) in the delivery room until death, without admission to special services.

Patients

All neonates eligible for neonatal care at CURGO between 1 January and 31 December 2011 were included in the study.

Data and analysis

A Microsoft Excel-based (Palisade Corp, Newfield, NY, USA) data monitoring system, implemented by the project in 2011,¹² served as the data source for the study. Data from maternal and child files were single-entered into the database by the hospital project data manager, who was also responsible for ensuring the validity of the data by notifying doctors, nurses and hospital supervisors on a weekly basis if data were incomplete or inconsistent.

The main neonatal diagnoses, largely based on standard World

TABLE 2 Case definitions for neonatal diagnoses used at CURGO, Burundi

Neonatal sepsis (suspected case):

Any neonate with fever >38°C (axillary temperature) or hypothermia <35.5°C (persistent, not explicable by exposure or hypoglycaemia)

AND any of the following:

- convulsions
 - respiratory compromise: respiratory rate >60 or <20, apnoea, retractions
 - poor feeding
 - decreased mental status—lethargy, unresponsiveness
 - severe local infection—e.g., many or severe skin pustules or blisters, or pus, redness or swelling
 - severe jaundice—i.e., involving the hands or feet
- Note: diagnosis not confirmed by blood culture

Birth asphyxia:

- history of difficult or prolonged labour or birth, and/or failure of the baby to breathe spontaneously at birth, usually requiring resuscitation
 - OR
 - any neonate with Apgar score between 0 and 4, 1 min after birth
 - OR
 - any neonate with Apgar score between 0 and 6, 5 min after birth
- Note: blood gas analysis not used as a diagnostic criterion (unavailable)

Conditions associated with low birth weight:

- conditions such as hypoglycaemia, hypothermia, respiratory distress or apnoea linked to preterm birth and not explained by other diagnoses
- Note: systematic glucose testing done in low birth weight neonates

Respiratory distress not otherwise specified:

- respiratory distress of uncertain underlying cause. Respiratory distress clearly linked to other primary diagnoses, such as sepsis or conditions linked to prematurity (i.e., respiratory distress syndrome associated with lung immaturity), are not included in this case definition.

Congenital infections:

- any infection acquired via the mother with the disease (vertical transmission): hepatitis B, toxoplasmosis, cytomegalovirus, rubella, syphilis, HIV*, malaria, chlamydia, gonorrhoea, herpes, etc. This is a presumptive clinical diagnosis made by the doctor on the basis of maternal disease and/or suggestive clinical signs/symptoms in the neonate. Possible supporting laboratory tests are: malaria rapid diagnostic test or malaria smear; HIV rapid antibody tests; Standard Diagnostics Biline syphilis test.
- Note: laboratory tests performed based on clinical suspicion

*Routine HIV testing was not done at CURGO at the time of the study, but some women presented with known HIV status. In this centre, symptomatic neonates born to HIV-infected women were classified as 'congenital infections', although these were in fact simply HIV-exposed babies. CURGO = Centre d'Urgences Gynéco-Obstétrique; HIV = human immunodeficiency virus.

Health Organization clinical case definitions,¹⁴ are provided in Table 2. Sophisticated investigations, such as blood cultures for the diagnosis of neonatal sepsis, or blood gas analysis for birth asphyxia, were not performed. The facility discharge status was defined as discharge (to home), in-facility death before 24 h of life, in-facility death after 24 h of life, absconded or referral. Maternal complications are defined elsewhere.¹² Data analyses reporting on frequencies and percentages were performed using SPSS 11.0 (SPSS Inc, Chicago, IL, USA).

Ethics review

The study met the Médecins Sans Frontières Ethics Review Board and the Burundi Ethics Committee's approved criteria for the analysis of routinely collected programme data. The study was also approved by the Ethics Advisory Group of the International Union Against Tuberculosis and Lung Disease, Paris, France.

RESULTS

A total of 2285 women with or at risk of complications delivered during the study period (Table 3). There were 2110 live neonates and 175 stillbirths, of whom 80% had no detectable foetal heart rate at the time of maternal admission. Of the 2110 live neonates, 453 (21%) were admitted to special services. The basic demographic and birth characteristics of these groups are shown in Table 4. Of all neonates, 24% were LBW, 46% were delivered by caesarean section and 13% required active birth resuscitation. These three characteristics, as well as neonatal risk factors for infection, were more frequent in children admitted to special services.

The facility discharge status for the live neonates is shown in the Figure. A total of 102 (5%) neonates died. Of those not admitted to special services, 35 (2%) died, with the majority of deaths occurring within the first 24 h of life. Very low birth weight (<1500 g; 26%), very low (≤ 3) 5-min Apgar score (51%) and instrumental vaginal deliveries (20%) were frequent in this group

TABLE 3 Characteristics of all women who delivered at CURGO, Burundi

Characteristic	n (%)
All women	2285
Maternal age, years, median [range]*	25 [14–47]
Provenance (health centre)	
In district	690 (30)
Out of district	1591 (70)
Missing data	4
Primigravida*	722 (32)
Complications during pregnancy or delivery	
Prolonged labour	331 (14)
Arrested labour	238 (10)
Previous uterine intervention, including caesarean section	203 (9)
Breech (in utero)	171 (8)
Multiple gestation	150 (7)
Uterine rupture or pre-rupture	92 (4)
Preterm labour	81 (4)
Prolonged rupture of membranes >12 h	79 (3)
Antepartum haemorrhage	69 (3)
Foetal distress	69 (3)
Postpartum haemorrhage	66 (3)
Cord prolapse	48 (2)
Pre-eclampsia	38 (2)
Other risks†	650 (28)

*Missing data: maternal age ($n = 36$); gravida ($n = 9$).

†Includes 5 cases of malaria during pregnancy.

CURGO = Centre d'Urgences Gynéco-Obstétrique.

TABLE 4 Characteristics of all live-born neonates, neonates admitted to special neonatal services and neonates not admitted to special services who died in facility at CURGO, Burundi

Characteristic	Live-born neonates n (%)	Neonates admitted to special neonatal services n (%)	Neonates not admitted to special neonatal services who died in facility n (%)
All neonates	2110	453*	35
Male	1244 (59)	282 (62)	25 (71)
Birth weight, g			
<1000	11 (1)	6 (1)	4 (12)
1000–<1500	50 (2)	38 (8)	5 (14)
1500–<2000	133 (6)	93 (21)	5 (14)
2000–<2500	321 (15)	84 (19)	3 (8)
≥ 2500	1589 (75)	229 (51)	17 (49)
Missing data	6	3	1 (3)
Gestational age, weeks			
<32	69 (3)	37 (8)	5 (14)
32–36	150 (7)	67 (15)	5 (14)
≥ 37	1381 (66)	240 (53)	18 (52)
Missing data	510 (24)	109 (24)	7 (20)
Twin pregnancy			
Yes	230 (11)	85 (19)	6 (17)
No	1879 (89)	367 (81)	29 (83)
Missing data	1	1	0
Place of delivery			
CURGO	2059 (97)	444 (98)	34 (97)
Health centre	23 (1)†	4 (1)	0
Ambulance	11 (1)	4 (1)	1 (3)
Other	10 (1)	0	0
Missing data	7	1	0
Delivery mode			
Caesarean‡	963 (46)	229 (51)	15 (43)
Instrumental vaginal	222 (11)	46 (10)	7 (20)
Non-instrumental vaginal	908 (43)	174 (39)	13 (37)
Missing data	17	4	0
Presentation			
Cephalic	1906 (90)	388 (86)	29 (83)
Seat	138 (7)	49 (11)	1 (3)
Transverse	34 (2)	10 (2)	3 (8)
Other breech	28 (1)	5 (1)	2 (6)
Missing data	4	1	0
Active birth resuscitation			
Yes	267 (13)	143 (32)	18 (51)
No	1732 (82)	308 (68)	7 (20)
Missing data	111 (5)	2	10 (29)
Apgar score at 5 min			
0–3	46 (2)	26 (6)	18 (51)
4–6	213 (10)	138 (31)	3 (9)
7–10	1742 (83)	286 (63)	6 (17)
Missing data	109 (5)	3	8 (23)
Risk factors for infection§			
Prolonged labour >24 h	NA	84 (19)	NA
ROM >18 h or acute maternal fever	NA	72 (16)	NA
Maternal peri-partum sepsis	NA	29 (7)	NA
Other	NA	47 (10)	NA
None	NA	218 (48)	NA
Missing data	NA	3	NA

*54/453 (12%) neonates were transferred after 24 h of life from the maternity ward to special services.

†Reason for referral to CURGO was maternal post-partum haemorrhage for 19/23 (83%) neonates.

‡Indications for caesarean section (all live-born neonates) were: foetopelvic disproportion/arrested labour ($n = 285$); previous caesarean section ($n = 231$); breech ($n = 137$); foetal distress ($n = 111$); uterine rupture or pre-uterine rupture ($n = 61$); cord prolapse ($n = 44$); ante-partum haemorrhage ($n = 40$); other ($n = 31$); pre-eclampsia/eclampsia ($n = 23$).

§Neonatal risk factors for infections were not routinely reported for neonates who were not admitted to special services.

CURGO = Centre d'Urgences Gynéco-Obstétrique; ROM = rupture of membranes; NA = not applicable.

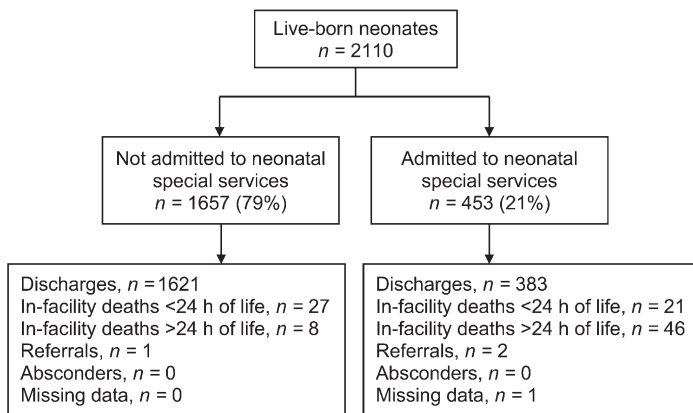


FIGURE Facility discharge status for live-born neonates at Centre d'Urgences Gynéco-Obstétrique, Burundi.

(Table 4). Of the neonates admitted to special services, there were 67 (15%) deaths, with the majority occurring after 24 h of life. The overall facility death rate increased with decreasing birth weight: ≥ 2500 g 3%; 2000–2499 g 5%; 1500–1999 g 14%; 1000–1499 g 32%; and < 1000 g 91%. There were no absconders, and the three registered referrals were for surgical interventions.

The principal diagnoses and conditions associated with death for infants admitted to special services are shown in Table 5. Conditions linked to LBW and birth asphyxia accounted for 57 (85%) deaths, with case-fatality rates of 20% and 18%, respectively. Although 'respiratory distress not otherwise specified (NOS)' accounted for fewer deaths ($n = 5$), it was associated with a high case fatality of 50%.

DISCUSSION

This is the first study to report on neonates in a district-level referral facility in sub-Saharan Africa specialising in treating mothers

TABLE 5 Principal diagnoses associated with death, and case-fatality rates in neonates admitted to neonatal special services in CURGO district hospital, Burundi

Diagnosis	Neonates admitted to neonatal special services <i>n</i>	Neonates who died in neonatal special services		Case-fatality rate %
		Total <i>n</i>	Died at <24 h of life <i>n</i> (%)	
Conditions linked to LBW	153	31	4 (13)	20
Birth asphyxia	144	26	12 (46)	18
Respiratory distress NOS	10	5	3 (60)	50
Sepsis or meningitis	20	2	1 (50)	10
Congenital malformation	10	1	1 (100)	10
Congenital infection*	18	1	0	6
No diagnosis	3	1	0	33
Other diagnoses or conditions†	95	0	0	0
Total	453	67	21	15

*Included one case of suspected congenital syphilis and four cases of human immunodeficiency virus exposure (but unconfirmed infection).

†Asymptomatic babies with risk factors for infection receiving antibiotic prophylaxis ($n = 52$); need for nutritional support ($n = 14$); skin infections ($n = 5$); hypoglycaemia ($n = 3$); necrotising enterocolitis ($n = 3$); diarrhoea ($n = 3$); hypothermia ($n = 2$); macrosomia ($n = 1$); anaemia ($n = 1$); apnoea ($n = 1$); other non-specified ($n = 10$). CURGO = Centre d'Urgences Gynéco-Obstétrique; LBW = low birth rate; NOS = not otherwise specified.

with complications during pregnancy or delivery. A high proportion of children were in need of active resuscitation at birth, and compared to similar settings, high numbers of LBW (< 2500 g) children were observed.¹⁵ About 21% of all neonates, many born with at least one of these risk factors, were admitted to special services. Altogether, one in 20 neonates in this study died, with a documented death rate of 15% in the neonates admitted to special services. The two major contributors to this death rate were conditions linked to LBW and birth asphyxia.

LBW has been associated with a large number of maternal conditions,^{15–18} including malaria. Malaria is the main cause of mortality among pregnant women in Burundi and could be a factor in our setting.¹⁹ Our data do not allow us to assess the possible contribution of malaria during the first trimester of pregnancy: only severe malaria during pregnancy ($< 1\%$ of referrals) was recorded as an admission criterion to our facility,¹² and preventive malaria treatment was not recorded. Other factors influencing LBW include maternal human immunodeficiency virus (HIV) infection and low antenatal care attendance. While neither of these was assessed (routine HIV testing was not implemented in CURGO at the time of the study), national figures for HIV prevalence among pregnant women (2.6%)²⁰ and first antenatal consultation attendance (99%)¹⁰ suggest that these are less likely to have contributed significantly.

In this study, the facility neonatal mortality rate of 5% was higher than the 4.2% national average in Burundi.²¹ However, unlike other referral facilities, which often include a mix of normal pregnancies and referrals, our centre received only referrals of women with complicated pregnancies or deliveries, and risk selection is likely to have played a role. When compared to similar inpatient settings, mortality rates were lower than those reported in Kenya, northern Nigeria and Tanzania (17–19%).^{7–9} The latter two studies were conducted in tertiary level hospitals. Unfortunately, there is little published information about neonatal hospital-based mortality at district level in sub-Saharan Africa, and international benchmarks are lacking.

Our data on neonatal mortality are in line with other reports from communities and hospitals in resource-poor settings, which indicate that the three main causes of neonatal mortality are complications of LBW, birth asphyxia and neonatal sepsis.^{2,22,23} In our study, neonatal sepsis was not a major contributor to overall mortality. Clean delivery practices, intrapartum maternal antibiotics and prophylactic antibiotics for neonates with risk factors for infection may have been protective. However, as neonatal sepsis was diagnosed clinically, without culture confirmation, as in other studies,²⁴ it may have been present among neonates with respiratory distress NOS and a number of LBW or asphyxiated neonates. Other blood tests, such as C-reactive protein or white blood cell counts, could have assisted in diagnosing sepsis, despite their limitations as single laboratory tests.²⁵ Finally, because of our facility's neonatal admission criteria, late-onset sepsis (outside our facility) could not be assessed.

The high proportion and case-fatality rate of birth asphyxia could have multiple causes. It may have resulted from the high proportion (24%) of women with prolonged or obstructed labour, as many of these neonates may have suffered from prolonged asphyxia in utero, complicating effective resuscitation. Referral delays may also be implicated,^{26,27} as 70% of all women delivering at CURGO were out-of-district referrals. However, extant evidence suggests that delays in the ambulance networks were minimal.²⁸ Facility-based delays may also have occurred and could have contributed to birth asphyxia. Although 12% of caesarean sections were reported to be for foetal distress and 14% for breech position,

there could have been delays in identifying foetal distress or in performing the caesarean. While caesarean sections for breech improve perinatal mortality,²⁷ only 69% of neonates in breech position were delivered by caesarean section. Birth resuscitation may also not have been performed effectively or in a timely fashion in all cases. Although training in birth resuscitation was emphasised at our facility, the maintenance of midwifery skills in birth resuscitation through reinforcement or retraining is important.²⁹ Finally, differences in birth asphyxia rates between our study and others may also be the consequence of the case definition, here using an Apgar score of <7 at 5 min, while some studies have used an Apgar score of ≤ 3 at 5 min.³⁰ Clinicians may also have considered the presence of neurological signs to diagnose asphyxia, which would explain why not all neonates with an Apgar score of <7 were admitted to special services. There was no systematic documentation of the severity of hypoxic-ischaemic encephalopathy, an important study limitation, as Apgar scores alone are not very specific and are poor predictors of neurological injury and outcome.³⁰

Most deaths among neonates who were not admitted to special services presumably occurred in those born in such a poor condition that they did not survive long enough to be transferred. However, the location of their death was not recorded in the database and the proportion of missing values was very high for some key variables. Moreover, we cannot explain how eight neonates died after 24 h without having been admitted to special services. This is an important gap in reporting and/or encoding that needs to be addressed urgently in our programmes, as it hinders our ability to adequately assess the quality of the immediate post-partum care that we provide.

We faced challenges in caring for extremely low birth weight (<1000 g) neonates, most of whom did not survive to hospital discharge. Unfortunately, we could not fully assess the contribution of gestational age, a strong predictor of morbidity and mortality in LBW neonates, due to the large number of missing values.³¹ Although maternal steroids were part of the obstetric protocol for women presenting with preterm labour, there was no documentation on whether neonates benefited from them.

Other technologies to help reduce mortality in our setting should be considered in the future. Phototherapy, a relatively simple measure, may have a beneficial impact on morbidity and mortality due to jaundice, a common complication in LBW neonates.³² Unfortunately, jaundice and deaths from kernicterus were not documented in our study. The feasibility and effectiveness of implementing additional respiratory technologies, such as continuous positive airway pressure, in resource-poor settings deserves further investigation.³

The strengths of this study were that all neonates born to mothers with complications in the course of one year were included, and the sample was therefore quite large. There were no absconders and a low referral rate, enabling accurate measures of in-hospital mortality for this type of population. The study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for reporting of observational studies.³³

Potential weaknesses included non-standard case definitions and unsystematic collection of important clinical parameters. Assessment of gestational age (based on estimates by the mother, ultrasound measurements or clinical assessment at birth) may not always have been accurate, and was missing in a quarter of the cases. Other variables also had high levels of missing data. There was no follow-up after discharge from the facility, an important limitation, as children managed for birth asphyxia or conditions linked to LBW remain particularly vulnerable during the first

months of life and may suffer from long-term disability.^{30,34} Finally, as the set-up of our facility was not a standard one, generalisability to other settings may not be possible.

Our study shows that in-facility neonatal deaths due to LBW and birth asphyxia are considerable among neonates born to women with a complicated pregnancy or delivery. Measures to address these two major causes of mortality should be strengthened.

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Contexte : Un service de soins d'urgence en obstétrique et soins néonataux de Médecins Sans Frontières dans le Burundi rural, spécialisé comme centre de référence pour trois districts à l'intention des femmes encourant des complications au cours de la grossesse et de l'accouchement.

Objectif : Décrire les caractéristiques et la mortalité lors de l'hospitalisation chez les nouveau-nés nés en 2011.

Schéma : Etude descriptive impliquant une revue rétrospective des données de routine du service.

Résultats : Parmi 2285 femmes qui ont accouché, les complications principales ont été les suivantes : prolongement du travail 331 (14%), arrêt du travail 238 (10%), intervention utérine antérieure 203 (9%), accouchement par le siège 171 (8%) et gestation multiple 150 (7%). On a noté 175 mort-nés et 2110 nouveau-nés en vie parmi lesquels un faible poids de naissance existait chez 515 (24%), un accouche-

ment par césarienne chez 963 (46%) et la nécessité d'une réanimation néo-natale active chez 267 (13%). Au total, il y a eu 102 décès néonataux (5%) et 453 des nouveau-nés (21%) ont été admis dans les services néonataux spécialement axés sur les bébés malades ou à faible poids de naissance. Une proportion plus élevée de ces nouveau-nés étaient nés par césarienne et avaient nécessité une réanimation active à la naissance. On a noté 67 décès néonataux (15%) dans les services spéciaux, parmi lesquels 85% étaient dus à des affections liées au faible poids de naissance ou à l'asphyxie lors de la naissance.

Conclusion : Parmi les nouveau-nés nés de femmes ayant encouru des complications au cours de la grossesse ou de l'accouchement, les décès hospitaliers liés à un faible poids de naissance et à une asphyxie à la naissance ont été nombreux. Une attention soutenue s'impose pour réduire ces décès.

Marco de referencia: Un centro de urgencias obstétricas y neonatales dirigido por Médicos Sin Fronteras, especializado como centro de referencia de las mujeres con complicaciones durante el embarazo o el parto de tres distritos rurales de Burundi.

Objetivo: Describir las características y la mortalidad intrahospitalaria de los recién nacidos atendidos en el 2011.

Métodos: Fue este un estudio descriptivo que consistió en el examen retrospectivo de los datos recogidos de manera sistemática en la institución.

Resultados: Se atendieron 2285 partos en el período del estudio. Las complicaciones que motivaron con mayor frecuencia la remisión consistieron en: el trabajo de parto prolongado en 331 casos (14%), la detención del trabajo de parto en 238 (10%), el antecedente de cirugía uterina en 203 (9%), presentación de nalgas en 171 (8%) y el embarazo múltiple en 150 mujeres (7%). Se recibieron 175 mortinatos y

2110 recién nacidos vivos, de los cuales 515 presentaron bajo peso al nacer (24%), 963 nacieron por cesárea (46%) y 267 neonatos precisaron reanimación activa al nacimiento (13%). En general, se presentaron 102 (5%) muertes neonatales. Se admitieron 453 neonatos en los servicios neonatales especiales que atienden a los recién nacidos enfermos o con bajo peso (21%). La mayoría de estos neonatos nació por cesárea y precisó reanimación activa al nacimiento. Se presentaron 67 casos de muerte neonatal en los servicios especiales (15%), de los cuales el 85% por complicaciones derivadas del bajo peso al nacer y la asfixia del nacimiento.

Conclusión: En los neonatos que nacieron de mujeres que presentaron complicaciones durante el embarazo o el parto fue considerable la mortalidad intrahospitalaria asociada con el bajo peso al nacer y la asfixia del nacimiento. Es preciso reforzar la atención con el fin de evitar estas situaciones.