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## Differences in barriers to birth and death registration in Guinea-Bissau: implications for monitoring national and global health objectives

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## ABSTRACT

**Objective:** Improving civil registration and vital statistics (CRVS) systems is essential to monitoring health objectives locally and globally. The barriers to birth and particularly death registration in low and middle-income countries are however poorly understood.

**Methods:** We conducted a survey among women of reproductive age in Bissau, the capital of Guinea-Bissau. We asked women with a birth in the past two years if their child had been registered and had obtained a birth certificate. We elicited the sources of information about birth registration, and asked respondents to list their reasons for (not) registering a birth. If their child had died, we asked similar questions about death registration.

**Results:** Most women (86%) had received messages about birth registration, but few women whose child had died had heard about the need to register deaths (22%). The primary sources of information about birth registration were messages broadcasted on the radio, or displayed at health facilities. Information about death registration was primarily obtained through informal social networks. Only 16% of births, and 2% of deaths, had been registered. The main barriers to birth registration were administrative pre-requisites and paternal absence. The main reasons for not registering a death were lack of knowledge about death registration, and lack of perceived benefits.

**Conclusion:** Strengthening CRVS systems requires addressing the specific barriers preventing birth and death registration. In Bissau, interventions to improve knowledge about death registration are needed. Simplifying registration procedures, as well as providing additional incentives, might help improve the coverage of birth registration.

1 **INTRODUCTION**

2

3 Civil registration is the process of recording vital events (e.g., births, deaths).  
4 It helps individuals secure access to rights such as healthcare, education or  
5 inheritance (1). It also allows the production of vital statistics (2). Civil registration and  
6 vital statistics (CRVS) systems operate continuously, and aim to document all events  
7 occurring in administrative units (3). When used timely and effectively, they may have  
8 a positive impact on population health (4), and they will be crucial to monitor progress  
9 towards the health-related sustainable development goal (SDG) in real-time, in small  
10 areas, and among disadvantaged population groups (5). For example, 14 SDG  
11 indicators are age and/or cause-specific mortality rates (e.g., neonatal mortality rate),  
12 which require CRVS data for their numerators. Other indicators require the number of  
13 births in their denominator (e.g., proportion of births attended by skilled health  
14 personnel). Finally, indicator 17.19.2 is specifically focused on the coverage of CRVS  
15 systems, since it tracks the “proportion of countries that have achieved 100 per cent  
16 birth registration, and 80 per cent death registration”.

17

18 Unfortunately, the CRVS systems of most low-and-middle income countries  
19 (LMICs) are deficient (6, 7). Only a fraction of events are registered, often with delays  
20 (8, 9). When deaths are registered, their causes may be poorly certified, for example  
21 due to limited availability of medical staff. To improve CRVS coverage, several  
22 initiatives in LMICs (e.g., 10) now focus on updating the laws that regulate civil  
23 registration, fostering the adoption of international registration standards,  
24 strengthening the administrative systems in charge of recording events, and/or  
25 adopting more practical tools to determine causes of death (11-13).

26

27 Improving CRVS coverage also requires stimulating the demand for event  
28 registration, particularly in settings where births and deaths often occur at home (14,  
29 15). This is so because CRVS systems are “passive”: individuals must contact a

1 CRVS agent, or another competent authority (e.g., local chiefs), to report the  
2 occurrence of an event, and complete the required paperwork. Several barriers may  
3 however prevent individuals from notifying CRVS authorities. In Indonesia, the high  
4 costs of registration, as well as long distances to registration offices, prevented the  
5 registration of births (16). In Kenya, up to a third of population members were not  
6 aware of requirements to register a child's birth (17).

7

8 Most studies of the barriers to civil registration in LMICs have focused on  
9 births (16, 17) rather than deaths. A few studies have compared awareness of birth  
10 and death registration in Nigerian States (18, 19), but other potential barriers to death  
11 registration have not been investigated. This is a significant gap in the research  
12 agenda necessary to scale-up CRVS. We compared sources of information about,  
13 and barriers to, the registration of births and infant deaths in Guinea-Bissau in West  
14 Africa.

15

## 16 **DATA AND METHODS**

17

### 18 *Study setting*

19

20 Guinea-Bissau is a low-income country with a population of  $\approx$  1.8 million  
21 inhabitants. Civil registration is under the authority of the ministry of Justice. The  
22 legal framework in Guinea-Bissau stipulates that birth registration is free, and should  
23 be accomplished at a civil registration office, within 30 days of birth. The parents of a  
24 child are jointly responsible for registration, and must present their identification card  
25 in order to register a birth. They must also provide a form from the hospital/clinic - or  
26 an immunization card if the child was born at home - to establish the child's date of  
27 birth. Upon registration, the child is issued a short-form birth certificate. Birth  
28 registration is free of charge for all children below age 7, but penalties are assessed

1 for older children. Death registration is also free but should be accomplished at the  
2 civil registration office within 3 days of the death. It requires a medical death  
3 certificate to establish cause(s) of death. Among other things (e.g., inheritance),  
4 death registration is needed to secure burial permits (20). However, some of the  
5 legislative requirements and potential penalties that regulate birth and death  
6 registration in Guinea-Bissau are only loosely enforced in practice. For example,  
7 burials frequently proceed at cemeteries in the absence of death registration.

8

#### 9 *Data sources*

10

11 We worked within the Health and Demographic Surveillance System (HDSS)  
12 of the Bandim Health Project (BHP). This is an open cohort that monitors the  
13 populations of six suburbs of Bissau, the capital city. The areas covered by the BHP  
14 are situated approximately 2 kms away from the city center, and include more than  
15 103,000 inhabitants (21). In these areas, the BHP records pregnancies, births,  
16 deaths and migrations since 1978. Every month, fieldworkers visit every household in  
17 BHP areas to record pregnancies and their outcomes (e.g., stillbirth vs. live birth).  
18 Children are followed every 3 months to record survival, nutritional status and health-  
19 seeking behaviors. New households (e.g., those established after construction of a  
20 new dwelling) are added to the BHP dataset on a continuous basis.

21

22 The BHP has never conducted interventions aimed at improving civil  
23 registration. However, BHP fieldworkers routinely review immunization cards of  
24 children under age 3 during periodic home visits. If the child does not possess an  
25 immunization card, the BHP fieldworker will procure one for him and will fill relevant  
26 information, including date of birth. As a result, some of the barriers to birth  
27 registration (i.e., availability of a document indicating the date of birth) may be less  
28 severe in the areas of the BHP than in the rest of Bissau.

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Between December 2016 and February 2017, we conducted a survey of women of reproductive age (15-49 years old) in BHP areas. The primary goal was to validate data on neonatal mortality generated by birth histories (22). A birth history requires respondents to list all the live-born children they have ever had, and to report their date of birth, vital status and whether they were part of a multiple or singleton birth. If the child has died, respondents are asked to report how old he/she was when he/she died. Such data constitute the primary source of information on fertility and child mortality for most LMICs (23, 24).

After the birth history, our questionnaire included follow-up questions about live births that occurred during the two years prior to the survey. These questions covered antenatal care, delivery and birth registration. If the child had died before the survey, respondents were also asked questions about death registration. If the birth was a multiple birth (e.g., twins), the follow-up questions referred to one of the children. If only one of the children in a multiple birth had died, the questions were asked about the deceased child. If all or none of the children had died we asked questions about the last-born.

The questions on birth and death registration encompassed a) exposure to information about event registration, and b) registration behaviors. All respondents were asked if they had ever heard or seen messages promoting the registration of births, and what were the sources of these messages. We also asked whether the birth had been registered, and if a birth certificate had been obtained for the child. If so, respondents were asked to list the reasons why they registered the birth. If the birth had not been registered, they were asked why they had not (yet) done so. If the respondent's child had died, we asked similar questions about exposure to messages promoting death registration, procurement of a medical death certificate,

1 registration of the death in the national civil registry and reason(s) for (not) registering  
2 the death. We extended the questionnaire used by Duff et al. (16) to describe  
3 barriers to birth registration, to also include reasons for (not) registering deaths.  
4 Multiple answers were allowed to questions about sources of information, and about  
5 reasons for (not) registering the birth/death. When asking these questions,  
6 interviewers were instructed not to prompt or suggest answers. They were solely  
7 encouraged to ask respondents if there were other sources or reasons, after each  
8 reason/source of information spontaneously listed by the respondent.

9

10           Based on BHP records, we selected a random sample of women of  
11 reproductive age residing within the areas monitored by the BHP. To achieve  
12 sufficient statistical power for the validation study, we over-sampled women whose  
13 child had later died, either as a neonate (<28 days) or as an older infant (28 days and  
14 older). All data were collected on Android tablets, using the Qualtrics software (25).

15

16

### 17 *Data analysis*

18

19           In total, 426 women participated in the survey, and 279 reported at least one  
20 live birth in the past two years. We focus on this latter subset of respondents. There  
21 are two analytical samples: a sample of 279 births, which provides data on sources  
22 of information about, and barriers to, birth registration; and a nested sample of 106  
23 deaths (all under age 2), which provides data on sources of information about, and  
24 barriers to, death registration. We constructed two sets of sampling weights that  
25 accounted for the over-sampling of births that resulted in a newborn or infant death.  
26 The first set of weights ensured that our data were representative of the births that  
27 had occurred in BHP areas in the past two years. The second set of weights  
28 accomplished the same for deaths.

29



1           We first described characteristics of mothers and children in each sample.  
2   Maternal characteristics included age, education, and religion. Age was classified in  
3   3 categories (15-24, 25-34 or 35 and older). Education was also classified in 3  
4   categories: no schooling, primary schooling or secondary/higher. Finally, the religious  
5   affiliations we considered were Catholic, Muslim or other religious groups.  
6   Characteristics of the child included parity, gender, place of birth (home, public facility  
7   or private facility), date of birth (more than a year prior to the survey, vs. less than a  
8   year), type of birth (singleton vs. multiple), and vital status (alive or deceased). For  
9   deceased children, we also included place of death (home, public facility or private  
10   facility), and age at death (less than 28 days vs. 28 days and older).

11

12           In each sample, we measured the proportion of respondents who reported  
13   ever having been exposed to messages about birth/death registration. We used  $\chi^2$   
14   tests to assess whether these proportions were associated with maternal and child  
15   characteristics. For those exposed to messages, we calculated the number of  
16   different sources from which they received messages, and we listed the various  
17   sources they mentioned.

18

19           Finally, we measured the proportion of births and deaths that had been  
20   registered with the national civil registry. For respondents who reported registering a  
21   birth/death, we listed the reasons they cited for doing so. For respondents, who  
22   reported not registering their child's birth and/or death, we listed the reasons they  
23   cited for not doing so. We measured the association between the maternal and child  
24   characteristics described above and the likelihood of birth registration. The limited  
25   sample size did not permit similar analyses for death registration. We report weighted  
26   frequencies and percentages. All analyses were conducted in STATA 14.

27

28

1 **RESULTS**

2

3 A third of the mothers of children born in the past two years were 15-24 years  
4 old, whereas 56.8% were 25-34 years old, and 11.1% were older than 35 years old  
5 (Table 1). Maternal education was limited, with 23.7% of women having had no  
6 schooling, and 31.3% having attended primary school. The main religious groups  
7 were Muslims (43.6%) and Catholics (36.0%). Among live births of the past two  
8 years, 18.5% were the first-born child of their mother. The majority of births (57.4%)  
9 occurred at a public facility, whereas 21.8% occurred at home. Only 1.4% of births  
10 were part of a multiple birth, and 92.1% of children were still alive at the time of the  
11 survey.

12

13

14 [TABLE 1 ABOUT HERE]

15

16

17 Most characteristics of deceased children were comparable to those of other  
18 births. However, deaths appeared more frequent among children who were the first-  
19 born child (31.7% vs. 18.5%) and among those in multiple births (11.3% vs. 1.4%).  
20 Most deaths occurred in a public facility (60.0%), but one in four deaths occurred at  
21 home. The neonatal period (< 28 days) accounted for 86.3% of deaths of children  
22 born in the past two years in this population.

23

24 Most mothers had been exposed to messages about birth registration  
25 (86.0%), but few of the mothers whose child has died had heard messages about the  
26 need to register deaths (22.0%). Exposure to messages about birth registration was  
27 more frequent among mothers with higher schooling levels than among mothers with  
28 no schooling or with only primary schooling (table 2, p<0.001), and it was higher

1 among Catholics and other religious groups than among Muslims ( $p < 0.001$ ).  
2 Exposure to messages about birth registration appeared lower among younger  
3 mothers (i.e., 15-24 year olds) and among births that occurred at home, but these  
4 differences were marginally significant ( $p = 0.090$ , and  $p = 0.079$ , respectively).

5  
6

7 [TABLE 2 ABOUT HERE]

8

9 Younger mothers were less likely to have heard about the need to register a  
10 death than women in the 25-34 or 35 and older age groups (6.3% vs. 29.2% and  
11 34.2% respectively,  $p = 0.020$ ). The places of delivery and death of a child were also  
12 associated with exposure to messages about death registration, with mothers whose  
13 child was born (or died) at a private facility significantly more exposed than others.

14

15 The mothers who had heard about the need to register births reported, on  
16 average, 2.32 sources of information about birth registration. Among them, 23.8%  
17 had one source of information, 36.8% had two sources, and 39.5% had more than 2  
18 sources. The main sources of information about birth registration were radio  
19 messages (71%, figure 1) and health facilities (47%). More than a third of  
20 respondents also reported discussing birth registration with relatives and friends. Few  
21 mothers reported hearing about the need to register births through registration  
22 campaigns, billboards or newspapers.

23

24 [FIGURE 1 ABOUT HERE]

25

26 Among mothers who had heard about the need to register deaths (22%), the  
27 sources of information about death registration were less varied. These mothers  
28 reported, on average, 1.25 sources of information about death registration. Only 15%

1 reported exposure to messages about the need to register a death through the radio  
2 or at health facilities. The primary sources of information about death registration  
3 were conversations with friends and relatives (figure 1).  
4

5 Sixteen percent of births, and less than 2% of deaths, had been registered  
6 prior to the survey. Among women who had registered the birth of their child, 20.1%  
7 did so to allow the government to count births; 13.5% to obtain various services;  
8 73.0% so that the child could later attend school; 49.9% to remember the child's date  
9 of birth; and 6.6% to travel abroad. Only 2 women reported having registered the  
10 death of their child. The only reason cited was that registration would allow the  
11 government to count deaths.  
12

13 Women who had not yet registered the birth of their child cited 1.36 reasons,  
14 on average, for not doing so. Among them, 67.1% reported only one reason, 30.4%  
15 reported two reasons, and 2.5% reported three or more reasons. The primary reason  
16 cited was lacking prerequisite documents (42%, figure 2). Recent mothers also often  
17 mentioned that the father's absence prevented birth registration (28%). Other  
18 frequently cited reasons for not registering a birth included: being too busy to register  
19 (13.5%), or considering that registration can wait (9.0%). Few mothers cited lack of  
20 knowledge about birth registration as a barrier (<2%).  
21

22 [FIGURE 2 ABOUT HERE]  
23

24 Women who had not registered the death of their child cited 1.15 reasons for  
25 not doing so, on average. Among them, 85.5% reported only one reason, 13.4%  
26 reported two reasons and 1.1% reported three reasons. Most women reported that  
27 they did not register their child's death either because they considered that death  
28 registration was not important (53%, figure 2), or because they did not know about

1 death registration (31%). Less commonly cited reasons for not registering a death  
2 included not knowing the registration process (5.9%), being too busy to register  
3 (4.7%), and forms not being available at the point of service (4.0%).

4  
5 The likelihood of birth registration was associated with several characteristics  
6 of mothers and children (table 3). The proportion of births that were registered was  
7 higher among women with secondary school education than among other women,  
8 and among Catholics than among Muslims and other religious groups. Birth  
9 registration was also higher among children born at public facilities (22.5%) than  
10 among children born at home (2.4%) or at private facilities (12.8%). Finally, birth  
11 registration was particularly low among children who had died prior to the survey  
12 (1.5% vs. 17.3% among those who were still alive).

13  
14 [TABLE 3 ABOUT HERE]

15 **DISCUSSION**

16  
17 In areas of Bissau covered by the BHP, birth registration rates were low, but  
18 death registration rates were even lower. Our survey helps understand the dynamics  
19 underlying this discrepancy. It highlighted large differences in exposure to information  
20 about birth and death registration. Most recent mothers we interviewed had received  
21 messages about the need to register births, but very few of the mothers whose child  
22 had died had received similar information about the need to register deaths. Recent  
23 mothers often reported hearing about birth registration through radio messages or at  
24 health facilities, but these sources of information rarely conveyed messages about  
25 death registration. Rather, the few mothers who had heard messages about the need  
26 to register deaths did so informally, through their networks of friends and relatives.

27 As a result, the barriers to registration differed broadly between births and  
28 deaths. Survey respondents reported that the key barriers to death registration were

1 lack of knowledge and a limited understanding of its benefits. On the other hand, the  
2 key barrier preventing the registration of births were the administrative pre-requisites  
3 for birth registration. In particular, in Guinea-Bissau, parents must present an  
4 identification card or another proof of identity to register the birth of their child. Adults  
5 often lack such documents, for example because the fees required to obtain them  
6 might be too high. Parents may also lack the documents needed to establish the  
7 child's date of birth if he/she was born at home (e.g., immunization card).

8 Mothers also often cited paternal absence as another reason for not  
9 registering the birth of their child. This absence may be due to separation or divorce,  
10 as well as to work-related migration. Paternal absence is problematic in Guinea-  
11 Bissau, because the legislation requires either the presence of both parents, or a  
12 much more complicated process that includes submission of procuration letters, in  
13 order to register a birth.

14 The reported barriers to birth registration differed from those reported in  
15 previous studies in other LMICs (16, 17). In this urban LMIC setting, where fees for  
16 registration of events have been waived for children under 7 years old, neither costs  
17 nor distance were reported as significant barriers to the registration of births and  
18 deaths. Similarly, despite concerns that periodic campaigns to register events may  
19 build passive registration behaviors, few mothers reported that they would rather wait  
20 for the next campaign to register the birth/death of their child.

21 Our study has several limitations. First, it was based on a relatively small  
22 sample size, particularly for recent deaths. We were thus not able to investigate  
23 potential disparities in death registration across population groups. Second, our  
24 sample was limited to events having occurred over the past two years. We thus did  
25 not investigate whether the barriers to birth registration may differ among  
26 unregistered older children (2 years and older), nor did we investigate the barriers to  
27 death registration among deaths at older ages (i.e., beyond 2 years old). Third, we  
28 only worked in a few suburbs, which may not be representative of the broader city of

1 Bissau. In particular, some of the administrative barriers to event registration might  
2 be more limited in the areas of the BHP. This is so because families might have  
3 easier access to immunization cards for their newborns than families in other parts of  
4 the city, due to active monitoring of immunizations by BHP fieldworkers. Fourth,  
5 because our study was only conducted in an urban setting, it does not provide  
6 information about the barriers to event registration that may be encountered in rural  
7 areas. In such places, registration facilities may be more difficult to access, and costs  
8 associated with travel to the facility may constitute a potential barrier, even if  
9 registration itself is free of charge. Fifth, we only interviewed mothers, without eliciting  
10 the viewpoints of other key actors in the registration processes, e.g., the father of a  
11 child, or the head of his/her household. Understanding the barriers perceived by  
12 these actors might help further improve the effectiveness of interventions to improve  
13 civil registration. Finally, we only collected quantitative survey data on the dynamics  
14 of civil registration. We did not collect qualitative data (e.g., focus group discussions),  
15 even though such data could have a) further improved our understanding of the  
16 reported barriers to the registration of births and deaths, and b) identified additional  
17 barriers that may not have been reported during the survey.

18         Nonetheless, our results suggest that simplifying some registration  
19 procedures might help improve the coverage of birth registration. Relaxing the  
20 requirement for both parents to be present for registration would address a key  
21 barrier to increasing birth registration rates in Bissau. This may be accomplished, for  
22 example, by requiring the presence of only one of the parents as in other countries  
23 (e.g., Ghana), or by making provisions for the absent parent (often the father) to sign  
24 the registry at a later date. Similarly, simplifying procedures for adults to obtain  
25 personal identification cards might help alleviate barriers linked to the administrative  
26 documents required to conduct birth registration. This could also be achieved by  
27 providing incentives (financial or non-financial) for birth registration that might help  
28 offset some of the costs associated with the acquisition of identity cards for parents.

1 Such incentives might further convince some parents who are delaying the  
2 registration of their child to conduct this activity in a timelier manner.

3 Our results also indicate that in Bissau, as likely in other LMICs, efforts to  
4 promote civil registration have disproportionately stressed the need to register births.  
5 The need to register deaths has been much less emphasized in recent  
6 communication programs, so that awareness of death registration remains low. This  
7 should be remedied: messages about the need to register deaths should be broadly  
8 diffused in LMICs. Without better balance between birth and death registration in  
9 CRVS promotion, the vital statistics produced by CRVS systems will likely under-  
10 estimate under-5 mortality rates, and will not allow monitoring progress towards SDG  
11 targets in near real-time.

12 The promotion of death registration may however require different  
13 communication approaches and channels than those used for promoting birth  
14 registration. For example, it might not be appropriate to address death registration  
15 during antenatal care visits with pregnant women at health facilities, or through mass  
16 media. This may unnecessarily induce stress - and possibly more serious adverse  
17 events - among pregnant women and their partners. Instead, the promotion of death  
18 registration may mobilize informal social networks, which already constitute a trusted  
19 source of information about this practice. It may also involve other CRVS  
20 stakeholders, such as funeral agents, religious authorities or local traditional chiefs.

21 Our results identify several population groups, which should be targeted by  
22 initiatives to improve civil registration in Bissau. In particular, young mothers (<25  
23 years old) and mothers with the lowest educational levels, appear to lack access to  
24 key information sources about birth/death registration. Similarly, Muslims in the BHP  
25 areas of Bissau were less frequently exposed to the need to register births than other  
26 religious groups. The civil registration authority and its partners should ensure that  
27 their efforts to promote CRVS reach those groups.



1           Finally, our experience collecting survey data on birth and death registration  
2 in Bissau suggests that respondents can provide detailed information about  
3 registration behaviors, including in the case of recent infant deaths. Similar questions  
4 could thus be included in large-scale population surveys such as the demographic  
5 and health surveys (DHS) or the multiple indicator cluster surveys (MICS). This may  
6 help monitor, and possibly accelerate, progress towards birth and death registration  
7 objectives set forth by the SDGs.

8           In conclusion, significant efforts in promoting death registration are needed in  
9 Bissau, so that affected families are aware of the need register deaths. However,  
10 even though such communication campaigns may help fill the registration gap  
11 between births and deaths, they will not be sufficient to achieve ambitious SDG  
12 targets (i.e., 100% coverage of birth registration, and 80% coverage of death  
13 registration). Such progress will likely also require simplifying registration procedures,  
14 for both births and deaths. Additional research should thus further investigate the  
15 administrative barriers that limit event registration in Guinea-Bissau and in other  
16 LMICs.

	<b>Births (n = 279)</b>	<b>Deaths (n = 106)</b>
<b>Characteristics of the mother</b>		
Age of the mother		
15-24 years	90 (32.1)	38 (35.9)
25-34 years	158 (56.8)	48 (45.1)
35 years and older	31 (11.1)	20 (19.0)
Schooling		
No schooling	66 (23.7)	25 (23.7)
Primary school	87 (31.3)	35 (32.6)
Secondary school and higher	127 (45.0)	46 (43.7)
Religion		
Catholic	100 (36.0)	39 (37.2)
Muslim	122 (43.6)	42 (39.7)
Other	57 (20.4)	25 (23.1)
<b>Characteristics of the child</b>		
Parity		
1 child	52 (18.5)	34 (31.7)
2-4 children	173 (62.1)	55 (52.1)
5 and more children	54 (19.4)	17 (16.2)
Place of delivery		
At home	61 (21.8)	14 (13.5)
Public facility	160 (57.4)	70 (65.7)
Private facility/other	58 (20.8)	22 (20.8)
Gender		
Male	144 (51.9)	59 (56.8)
Female	134 (48.1)	45 (43.2)
Time since birth		
< 1 year	134 (48.0)	51 (48.0)
≥ 1 year	145 (52.0)	55 (52.0)
Type of birth		
Singleton	275 (98.6)	94 (88.7)
Multiple	4 (1.4)	12 (11.3)
Vital Status		
Alive	257 (92.1)	--
Deceased	22 (7.9)	--
Place of death		
At home	--	26 (24.7)
Public facility	--	64 (60.0)
Private facility/other	--	16 (15.3)
Age at death		
0-28 days	--	91 (86.3)
28 days and older	--	15 (13.7)

**Table 1: Weighted characteristics of mothers and children**

*Notes: The numbers in the table are weighted numbers. Sampling weights were used to ensure that the data were representative of the births and deaths having occurred over the past two years in the HDSS area. Separate sets of sampling weights were used for births and deaths. Column percentages appear in parentheses.*

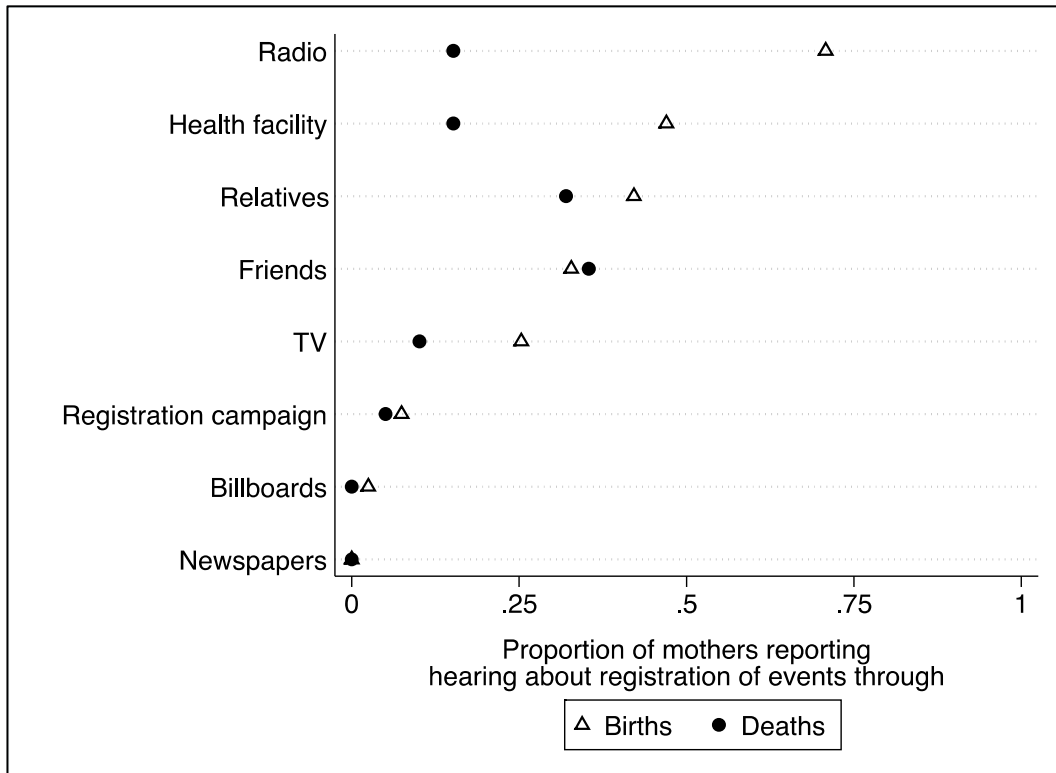
	Births		Deaths	
	N(%)	p-value	N(%)	p-value
<b>Total</b>	240 (86.0)	--	23 (22.0)	--
<b>Characteristics of the mother</b>				
Age of the mother		0.090		0.022
15-24 years	70 (78.5)		2 (6.3)	
25-34 years	142 (90.0)		14 (29.2)	
35 years and older	28 (89.3)		7 (34.2)	
Schooling		<0.001		0.407
No schooling	40 (60.6)		3 (13.5)	
Primary school	80 (91.2)		7 (20.4)	
Secondary school and higher	120 (96.3)		13 (27.5)	
Religion		<0.001		0.392
Catholic	97 (97.0)		12 (29.4)	
Muslim	88 (72.8)		7 (17.9)	
Other	55 (95.9)		4 (16.5)	
<b>Characteristics of the child</b>				
Parity		0.569		0.834
1 child	43 (83.0)		8 (24.4)	
2-4 children	153 (88.2)		12 (21.9)	
5 and more children	44 (82.9)		3 (16.7)	
Place of delivery		0.079		0.008
At home	47 (77.3)		3 (20.0)	
Public facility	145 (90.7)		10 (14.2)	
Private facility/other	48 (83.3)		10 (47.3)	
Gender		0.877		0.479
Male	125 (86.6)		12 (19.7)	
Female	115 (85.8)		11 (25.9)	
Time since birth		0.261		0.584
< 1 year	112 (83.4)		10 (19.4)	
≥ 1 year	129 (88.9)		13 (24.1)	
Type of birth		0.359		0.134
Singleton	236 (86.0)		22 (23.5)	
Multiple	4 (100.0)		1 (8.7)	
Vital Status		0.756		
Alive	221 (86.1)		--	
Deceased	19 (87.5)		--	
Place of death				0.013
At home	--		3 (12.9)	
Public facility	--		12 (18.2)	
Private facility/other	--		8 (50.4)	
Age at death				0.329
0-28 days	--		21 (23.1)	
28 days and older	--		2 (14.3)	

**Table 2: Differences in exposure to messages about birth/death registration by maternal and child characteristics.** Notes: The numbers in the table are weighted numbers. Sampling weights were used to ensure that the data were representative of the births and deaths having occurred over the past two years in the HDSS area. The numbers in parentheses represent the proportions of births/deaths whose mother received messages about birth/death registration in each population group.

	<b>N(%)</b>	<b>p-value</b>
Total	45 (16.0)	
<b>Characteristics of the mother</b>		
Age of the mother		0.612
15-24 years	14 (15.0)	
25-34 years	28 (17.9)	
35 years and older	3 (9.6)	
Schooling		0.003
No schooling	5 (6.9)	
Primary school	7 (8.5)	
Secondary school and higher	33 (26.2)	
Religion		0.137
Catholic	22 (22.3)	
Muslim	18 (14.7)	
Other	4 (8.0)	
<b>Characteristics of the child</b>		
Parity		0.367
1 child	6 (11.5)	
2-4 children	33 (19.0)	
5 and more children	6 (11.0)	
Place of delivery		0.010
At home	1 (2.4)	
Public facility	36 (22.5)	
Private facility/other	8 (12.8)	
Gender		0.504
Male	21 (14.4)	
Female	24 (18.0)	
Time since birth		0.011
< 1 year	12 (9.0)	
≥ 1 year	33 (22.7)	
Type of birth		0.314
Singleton	45 (16.3)	
Multiple	--	
Vital status		<0.001
Alive	44 (17.3)	
Deceased <sup>1</sup>	0 (1.5)	

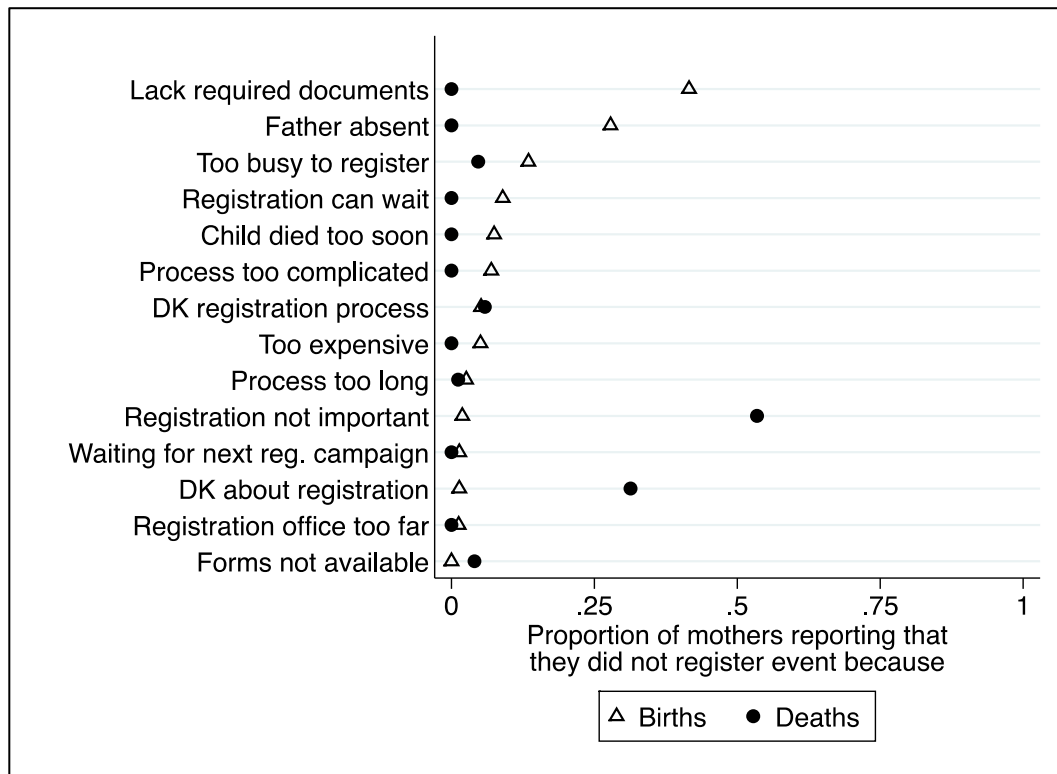
**Table 3: Differences in birth registration by maternal and child characteristics.**

*Notes: The numbers in the table are weighted numbers. Sampling weights were used to ensure that the data were representative of the births having occurred over the past two years in the HDSS area. The numbers in parentheses represent the proportions of births that were registered at the time of the survey in each population group. <sup>1</sup> The weighted frequency was 0.3 and was rounded to zero for presentation.*



**Figure 1: Information sources about civil registration in Bissau.**

*Notes:* Multiple answers were allowed to questions about the sources of information. As a result, the proportions reported in the graphs do not sum to 1.



**Figure 2: Reported reasons for not registering vital events in Bissau.**

*Notes:* Multiple answers were allowed to questions about the sources of information, and the reasons for not registering an event. As a result, the proportions reported in the graphs do not sum to 1.

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