



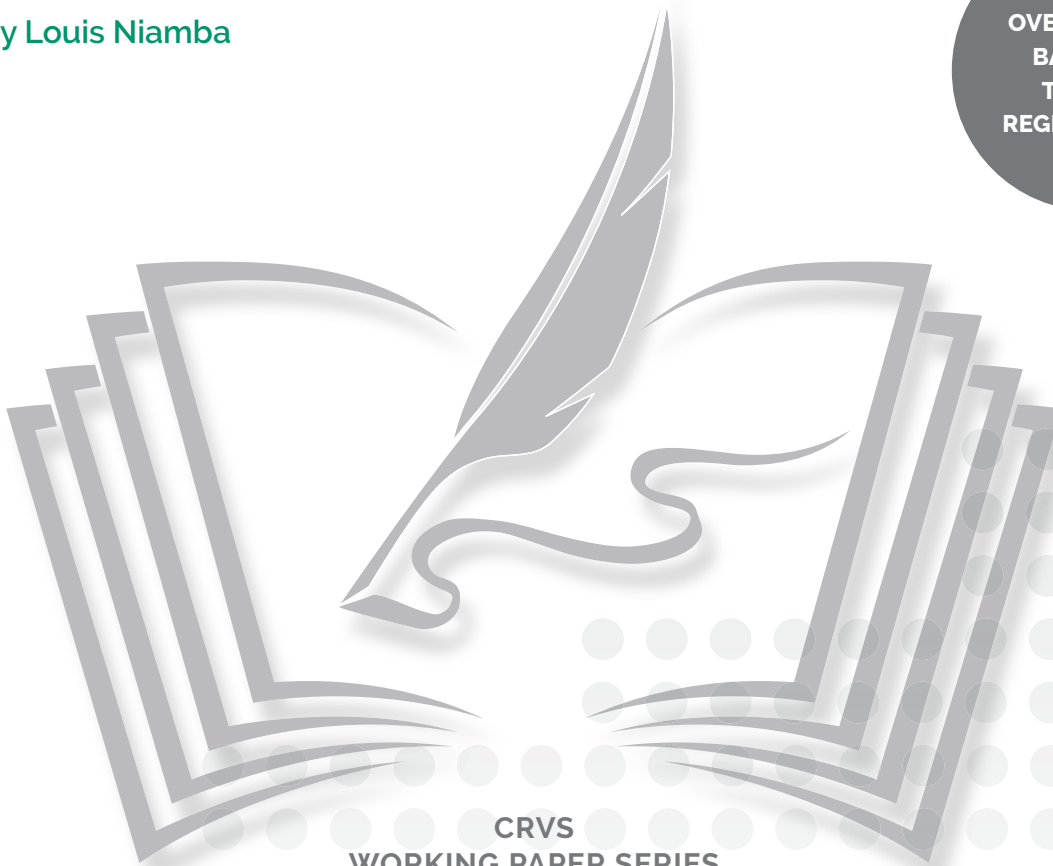
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Geographical and Gender Disparities in the **Registration of Births, Marriages, and Deaths** in the Nouna Health and Demographic Surveillance System, **Burkina Faso**

by Louis Niamba

OVERCOMING
BARRIERS
TO CIVIL
REGISTRATION



CRVS
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This paper was authored by Louis Niamba, an International Development Research Centre (IDRC) Research Award Recipient in 2019. This research was mentored by Irina Dincu, Senior Program Specialist with the Centre of Excellence for CRVS Systems at IDRC. Originally drafted in French and submitted to IDRC as a final technical report, the Centre of Excellence is publishing this paper in both English and French. The aim is to make these research findings widely accessible for discussion, debate, and use by the global community of practice.

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Abstract

Background: Despite efforts made by Burkina Faso to improve its civil registration and vital statistics (CRVS) systems, there is a long road to reach universal civil registration. Only 49.4 percent of births, and only 34.3 percent of deaths in health facilities, were registered within the two-month legal deadline for registration in 2017 (DGMEC 2018). In contrast to births and deaths, there are almost no national statistics on marriage registration in Burkina Faso.

Objective: In light of these statistics, our study aims to contribute to improving completeness of vital events registrations in Burkina Faso by highlighting factors and barriers that limit birth, marriage, and death registration.

Data and methods: The Nouna Health and Demographic Surveillance System served as the study area. On the demand side, our research focused on 495 births, 332 deaths, and 155 marriages that occurred in households in 2015. On the supply side (health facilities, civil registration offices), we conducted 14 interviews, where we collected qualitative and quantitative data. Independent sample ratio tests and logistics methods were used for data analysis.

Results: Our results indicate that only 37 percent of births were registered within the legal period of two months. Birth registration was found to positively correlate with factors such as living in a semi-urban area, proximity to a civil registration office, mothers in possession of an identity document, couples in a civil union, and giving birth in a healthcare centre. For marriages, the results show that only 2 percent of respondents entered into a civil union contract. Religious marriage was most prevalent in the Nouna Health and Demographic Surveillance System at 77.4 percent, and 60 percent of interviewees supported the registration of religious marriages. Finally, only 2.7 percent of deaths were registered, yet 30.4 percent of deaths occurred in health facilities. While almost all respondents (99.8 percent) knew that births should be registered, only 7 percent were aware of death registration. Causes of death analysis showed that young people died more of communicable diseases, while the majority of elderly deaths were from noncommunicable diseases.

Recommendations: Health facilities should be established as secondary birth and death registration centres. Based on our findings, this would increase birth registration rates from the current level of 37 percent to more than 95 percent. Similarly, if health facilities serve as death registration centres, death registration would increase from the current level of 2.7 percent to 30.4 percent. In Burkina Faso, only marriages celebrated before the registrar are currently registered. To increase marriage registration and to reflect the local reality, Burkina Faso should recognize the legality of religious marriage. With regards to causes of death, the government should consider making geriatric services available to older people who are increasingly dealing with chronic diseases.

Keywords: civil registration, vital statistics, births, marriages, deaths, causes of death, Nouna, Burkina Faso, Africa.

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List of acronyms

CMA	Centre médical avec antenne chirurgicale [medical centre with surgical unit]
CRVS	Civil registration and vital statistics
CSPS	Centre de Santé et de Promotion Sociale [Health and Social Promotion Centre]
DGMEC	Direction générale de la modernisation de l'état civil [Civil Registration Modernization Directorate]
INSD	Institut National de la Statistique et de la Démographie [National Institute of Statistics and Demographics]
InterVA	Interpreting verbal autopsy



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Context and rationale

According to the United Nations, civil registration may be defined as the continuous, permanent, compulsory recording of the occurrence and characteristics of vital events, namely live births, marriages, divorces, as well as annulments, judicial separations, adoptions, legitimations, and recognitions (UN 2003). The first function of civil registration is legal protection, thus guaranteeing individuals the legal recognition of their identity (AbouZahr et al. 2015). Civil registration is an inherent right of every human being, but it is also essential for the strengthening of countries' administrative governance and for people's access to public services. In addition, vital statistics enable governments to use evidence to implement efficient social development programs (AbouZahr et al. 2018).

Properly functioning civil registration systems provide countries with reliable and up-to-date information on the number of births, marriages, divorces, deaths, and their causes in their populations (Mikkelsen et al. 2015; AbouZahr et al. 2018). However, in many developing countries, particularly in sub-Saharan Africa, civil registration systems do not have optimal coverage (Yé et al. 2012; Mikkelsen et al. 2015). According to the World Bank, more than 1.1 billion people have no legal proof of identity; 78 percent of them live in sub-Saharan Africa and South Asia (World Bank 2017). Civil registration is provided for by law or regulation, in accordance with the legislative provisions of each country. Nevertheless, the legislation in force in a large number of African countries south of the Sahara, and very often inherited from colonial times, is full of gaps and has not been revised to comply with international standards (AbouZahr et al. 2015; ECA 2017).

Birth registration tends to receive more attention than the registration of other vital events from governments, funders, and non-governmental organizations (ECA 2017). Globally, 67 percent of births were registered in 2015 (AbouZahr et al. 2018). While birth registration and possessing a birth certificate provide access to a legal identity and other rights (access to education and health services, the right to vote, etc.), other registration acts, such as marriage and death registration, are also important. Statistics on marriage registration in sub-Saharan Africa are fragmented and often nonexistent. Unlike religious and traditional customary unions, civil unions protect women's rights, especially if their spouse dies. Widows, in most cases in sub-Saharan Africa, face enormous hardships in the wake of their spouse's death. These hardships range from the woman and her children losing inheritance rights to property to the levirate (where a widow is obliged to marry the brother of the deceased man). These problems could be mitigated if women were legally married to their husbands and had their death certificates.

An analysis of marriage and death registration provides an idea of the degree of women's vulnerability. In 2013, only 45 percent of deaths worldwide were registered (AbouZahr et al. 2018). Death registrations worldwide have increased from 28 percent in 1970 to 45 percent in 2013, an increase of 17 percentage points in 43 years (AbouZahr et al. 2018). On the other hand, in sub-Saharan Africa, causes of death are rarely identified (Mikkelsen et al. 2015), even though the level of mortality by cause is a crucial element in planning population health interventions (Murray and Lopez 2012; De Savigny et al. 2017). Unfortunately, as indicated above, the legislation in force in some countries such as Burkina Faso is limited and does not allow causes of death to be registered. Even where there is the possibility of mentioning the cause of death in the

register, and the cause of death is known, people can be reluctant to have it listed on the death certificate because of the stigma it could engender. Cause-of-death information also remains incomplete, especially in sub-Saharan Africa, due to low civil registration coverage (Garenne et al. 1999; Duthé and Pison 2008; Soura et al. 2014). Many deaths occur at home and without medical assistance (Soura et al. 2014). Information on the causes of death in sub-Saharan African countries is therefore fragmentary (Duthé and Pison 2008; Streatfield et al. 2014), as it often comes only from health centres.

In light of these civil registration system limitations in developing countries, and especially in sub-Saharan Africa, there is an urgent need to propose solutions to improve civil registration if the world wants to monitor, measure, and achieve the United Nations Sustainable Development Goals in 2030. At least two sustainable development goals and 67 indicators refer to civil registration and vital statistics. These include Target 16.9, which aims to achieve a legal identity for all, including birth registration, and Target 17.19, which aims for all countries to achieve 100 percent birth registration and 80 percent death registration by 2030 (AbouZahr et al. 2018).

Many studies have already been conducted on the topic of civil registration and vital statistics (CRVS) in developing countries, and many constraints to civil registration have been highlighted in this research. The results of this research cannot be automatically extrapolated to other developing country contexts because quite often there are cultural factors that influence civil registration (Tobin et al. 2013; Mohanty and Gebremedhin 2018). As each context has its own customs and habits, it would therefore be important to study each environment to highlight the specific factors that hinder civil registration. Our study of the Nouna Health and Demographic Surveillance System is part of this dynamic.

Study objectives

This research aims to contribute to improving the coverage and completeness of civil registration in Burkina Faso. More specifically, the purpose of our study is to

1. identify the level of civil registration completeness (births, marriages, and deaths) in the Nouna Health and Demographic Surveillance System;
2. highlight geographical and gender disparities in civil registration completeness in the Nouna Health and Demographic Surveillance System;
3. identify causes of death in the Nouna Health and Demographic Surveillance System;
4. determine the factors associated with civil registration in the Nouna Health and Demographic Surveillance System; and
5. propose solutions to improve the coverage and completeness of civil registration.

Each of our specific objectives corresponds to a specific research question.

Specific research questions

1. What is the level of civil registration completeness in the Nouna Health and Demographic Surveillance System?
2. What are the geographical and gender disparities in the civil registration completeness in the Nouna Health and Demographic Surveillance System?
3. What are the main causes of death in the Nouna Health and Demographic Surveillance System?
4. What are the factors associated with civil registration in the Nouna Health and Demographic Surveillance System?
5. What are the prospects for improving the coverage and completeness of civil registration in the Nouna Health and Demographic Surveillance System?

Literature review: Overview of factors associated with civil registration in developing countries

Factors associated with birth registration

A high propensity for birth registration has been associated with parents' high education levels (Tobin et al. 2013; Nascimento et al. 2015; Mohanty and Gebremedhin 2018), high parental household living standards (Mohanty and Gebremedhin 2018), living in urban areas (Nascimento et al. 2015; Pelowski et al. 2015), birth in a health centre (Nascimento et al. 2015; Pelowski et al. 2015; Mohanty and Gebremedhin 2018), high number of prenatal consultations (Nascimento et al. 2015; Mohanty and Gebremedhin 2018), short distance between the household and the nearest civil registration office, and greater empowerment of the child's mother (Mohanty and Gebremedhin 2018). Source of information is also important in birth registration. Birth registration levels are high when the information comes from a health centre (Pelowski et al. 2015). Cultural factors such as ethnicity and religion (Tobin et al. 2013; Mohanty and Gebremedhin 2018) also affect birth registration levels. Marital status is also an important variable in birth registration, with births of children of married people being the most registered (Tobin et al. 2013).

It should be noted, however, that the results of the various studies on the subject do not always point in the same direction. While Garenne et al. (2016) found that mothers' age had an effect on birth registration in South Africa, Tobin et al. (2013) found no effect of parental age on birth registration in Nigeria. Mohanty and Gebremedhin (2018) found no effect of place of residence on birth registration in India. Finally, several studies found no effect of a child's gender on birth registration (Tobin et al. 2013; Garenne et al. 2016; Mohanty and Gebremedhin 2018).

In previous publications (Yé et al. 2012; Tobin et al. 2013; Garenne et al. 2016; World Bank 2017), several reasons were cited for the registration or non-registration of births. Some participants in the studies reported that they register the birth of their child either for self-identification, schooling, or benefits purposes. There are also some people who admit that they are unaware of

the importance of birth registration and others who are unaware of the difference between birth registration and obtaining a birth certificate. On the other hand, non-registration of births could be explained in part by the lack of collaboration between the ministry of health and the ministry responsible for civil registration. Close collaboration between these two ministries would ensure that health centres where certain vital events (births and deaths) occur also serve as civil registration locations. In addition, better training of health stakeholders in the International Classification of Diseases could help to better identify causes of death. Vaccination campaigns can also be used to register births. Finally, the involvement of community-based health workers would be a good approach in the search for better coverage of civil registration.

As a result of the progress made in birth registration, many studies have focused on this theme. However, studies targeting other vital events, such as marriages, deaths, and the causes of death, are less numerous.

Factors associated with marriage registration

The factors associated with marriage registration in many African countries such as Burkina Faso can be understood by looking at the factors associated with civil unions. Legislation inherited from colonial times does not recognize traditional or religious unions, and therefore such unions cannot be officially registered. Unfortunately, we did not identify any studies that address the factors associated with civil unions. Nevertheless, there are a few studies that address the determinants of union in a general way in sub-Saharan Africa, which show a degree of unanimity on the relevant variables. These include level of education, standard of living, religion, ethnicity, age, and place of residence. Living in urban areas and having a high level of education are associated with a low prevalence of unions, while being Muslim is connected to a high level of unions (Hayase and Liaw 1997; Ezra 2003; Shapiro and Gebreselassié 2014).

Factors associated with death registration

A few studies have also looked at factors explaining death registration in developing countries. As with birth registration, a high household standard of living (Garenne et al. 2016), a high level of education of the deceased (Garenne et al. 2016), and living in an urban environment (Johnson et al. 2015) are associated with a high propensity for death registration. Like birth registration studies, death registration studies do not always point in the same direction. While Garenne et al. (2016) and Johnson et al. (2015) found that deaths of children under 5 and of men were under-registered, Tobin et al. (2013) found that variables such as age, gender, education, religion, and marital status had no impact on death registration in Nigeria. In Morocco, Silva (2016) showed that from 1994 to 2004, deaths of men were twice as likely to be registered than those of women.

Participants in the above studies generally cited the need for proof of death for burial and funeral rites, inheritance issues, and government planning as reasons for death registration. However, some people have no idea why there is registration of deaths. Finally, it should be reiterated that the same reasons mentioned above for non-registration of births also apply to deaths.

Methodology

The civil registration context in Burkina Faso

Burkina Faso, formerly Upper Volta, is located in West Africa, in the Niger Loop, and is landlocked. It covers 272,967 km² and is bordered to the north and west by Mali, to the northeast by Niger, to the southeast by Benin, and to the south by Togo, Ghana, and Côte d'Ivoire. Burkina Faso is a farming country. According to estimates by the Institut National de la Statistique et de la Démographie (INSD), or the National Institute of Statistics and Demographics, the population of Burkina Faso was 19,632,147 in 2017. With a crude birth rate of 38.2 per 1,000 and a mortality rate of 8.3 per 1,000, 749,948 births and 162,947 deaths should have been registered in 2017. The population of Burkina Faso is exceptionally young. According to the 2016 social scoreboard statistics, people between the ages of 0 and 14 accounted for almost half of the country's total population, while people aged 65 and over accounted for only about 3 percent of the population from 2007 to 2016. During the same period, the proportion of young people (ages 15 to 35) was about 32 percent and the vaccinated population (ages 0 to 4) was nearly 19 percent. The primary school-aged population (ages 6 to 11) is estimated at 15 percent from 2007 to 2011 and at 18 percent from 2012 onwards. The rate of young children in school is impacted by the lack of a birth certificate, which is proof of a dysfunction in civil registration in this country.

Civil registration in Burkina Faso is currently governed by *Zatu (act) an VII 13 du 16 novembre 1989 portant institution et application d'un code des personnes et de la famille*, or the Code of the Persons and the Family. The registration of births, marriages, and deaths is governed by sections 106 to 122 of this legislation. Section 106 of the legislation states that all births occurring on Burkinabe territory must be reported to the civil registration officer in the place of birth. This declaration must be made within two months after the date of birth. Birth certificates, national identity cards, or any other valid identity documents held by the parents are required for birth registration. Section 117 states that deaths must be reported within two months to the civil registration officer in the place of death. Birth certificates, national identity cards, or any other valid identity documents held by the deceased are required for death registration.

Despite the compulsory and free nature of birth and death registrations (declarations), coverage and completeness levels for these events remain low. Among the reasons is that the civil registration system does not work as it should, or that the issuance of vital records is subject to costs that vary from one civil registration centre to another. Aware of the need for an effective civil registration and vital statistics (CRVS) system, the Government of Burkina Faso undertook in 2012 to [translation] "make civil registration, by 2025, an effective instrument for identifying individuals and ensuring the exercise of full citizenship on the one hand, and a tool for social stability and forward planning for the development, implementation, and monitoring/evaluation of development policies and programs on the other." To honour this commitment, a national civil registration strategy was implemented in 2012 and revised in 2017 by decree no. 2017-0311/PRES/PM/MATD of 12 May 2012.

Births

In Burkina Faso, birth registration levels are improving because the government and development partners give birth registration more attention than the registration of other vital events. In 2006, the birth registration rate for all ages in Burkina Faso was 62.3 percent (INSD 2006). In 2010, the level of birth registration of children under 5 years of age was estimated at 77 percent for the country (INSD 2010). According to the same source, 52 percent of children under 5 years had a birth certificate, while 25 percent of children who had their births registered did not have a birth certificate, either because the document was never given to the parents or because it was lost. According to data from the 2014 Enquête multisectorielle continue (EMC), or ongoing multisector survey, out of an estimated national population of 17.9 million in Burkina Faso, the rate of possession of a birth certificate or a substitute birth certificate was estimated at 79.2 percent. These statistics do not allow for an assessment of the quality of the birth registration system because they are aggregated and do not provide information on birth registration levels within the statutory deadline.

The report on the implementation of the 2017 action plan on the national civil registration strategy gives us an idea of this level of birth registration within the statutory deadline. This report notes that 741,830 births took place in all public and private health facilities in Burkina Faso. However, the rate of registration of these births within the two-month statutory deadline by civil registration offices throughout Burkina Faso was estimated at 49.4 percent. The central region, which includes Ouagadougou (the capital) and its surrounding area, recorded the highest rate (77.6 percent), compared with the Sahel region, which recorded the lowest rate (22.8 percent). Also in 2017, a total of 961,241 birth certificates were issued, of which 37.8 percent were registered within the two-month statutory deadline and 62.1 percent were judgements declaring birth. This high proportion of births registered outside the deadline is, in our view, indicative of the poor quality of the birth registration system in Burkina Faso.

Marriages

In contrast to births, there are almost no national marriage registration statistics in Burkina Faso. Without an empirical household study, it is difficult to establish marriage registration rates. To date, the statistics available on this phenomenon come only from the civil registration offices, which can only give the absolute numbers of unions. According to statistics in the Report on the Implementation of the 2017 National Civil Registration Strategy Action Plan, a total of 13,045 marriages were celebrated in 2017, of which 11,085 were monogamous and 1,960 were polygamous.

Deaths

Following the example of marriages, death registration statistics are rare. According to the estimates from the National Institute of Statistics and Demographics, 162,947 deaths were expected in 2017 for Burkina Faso as a whole. However, the statistics available in the Report on the Implementation of the 2017 National Civil Registration Strategy Action Plan state that only 20,630 deaths occurred in public and private health facilities in Burkina Faso. Putting these two figures together shows an average number of 1 in 10 deaths occurring in health facilities. These results are similar to those obtained by Baya in 2004, who had estimated that only 1 in 13 deaths had been registered by a health facility in Burkina Faso. Of the 20,630 deaths occurring in health

facilities in 2017, only 7,066 had been registered by civil registration offices within the two-month statutory deadline — a national registration rate of 34.3 percent. It should be noted that this national death registration rate is largely overestimated because deaths occurring in health facilities are more likely to be registered than deaths that occurred outside health facilities, which are also more numerous.

Despite the efforts of the Government of Burkina Faso and its partners over the years to improve civil registration, there is still a long way to go to achieve universal civil registration. The mixed statistics (particularly those on marriages and deaths) can be explained in part by the fact that the actions implemented by the national civil registration strategy are not always evidence based. Moreover, like many other countries in sub-Saharan Africa, Burkina Faso does not have a good system for monitoring vital events. There is almost no connection between civil registration and vital statistics. There is no information on civil registration from the National Institute of Statistics and Demographics, which is responsible for the development and dissemination of vital statistics (DGMEC 2018). Therefore, apart from a few estimates obtained from civil registers, an analysis of national vital statistics is almost impossible, and we have no real idea of the levels of coverage and completeness of vital events in Burkina Faso. To fill this gap, health and demographic surveillance systems can be used more effectively to generate evidence on births, marriages, divorces, deaths, and causes of death. It is important to identify the most effective actions to take to improve the registration, use, and regular dissemination of disaggregated vital statistics in Burkina Faso. This pilot study in the Nouna Health and Demographic Surveillance System will provide insight into the completeness of vital events in this part of Burkina Faso and contribute to identifying barriers to civil registration in Burkina Faso.

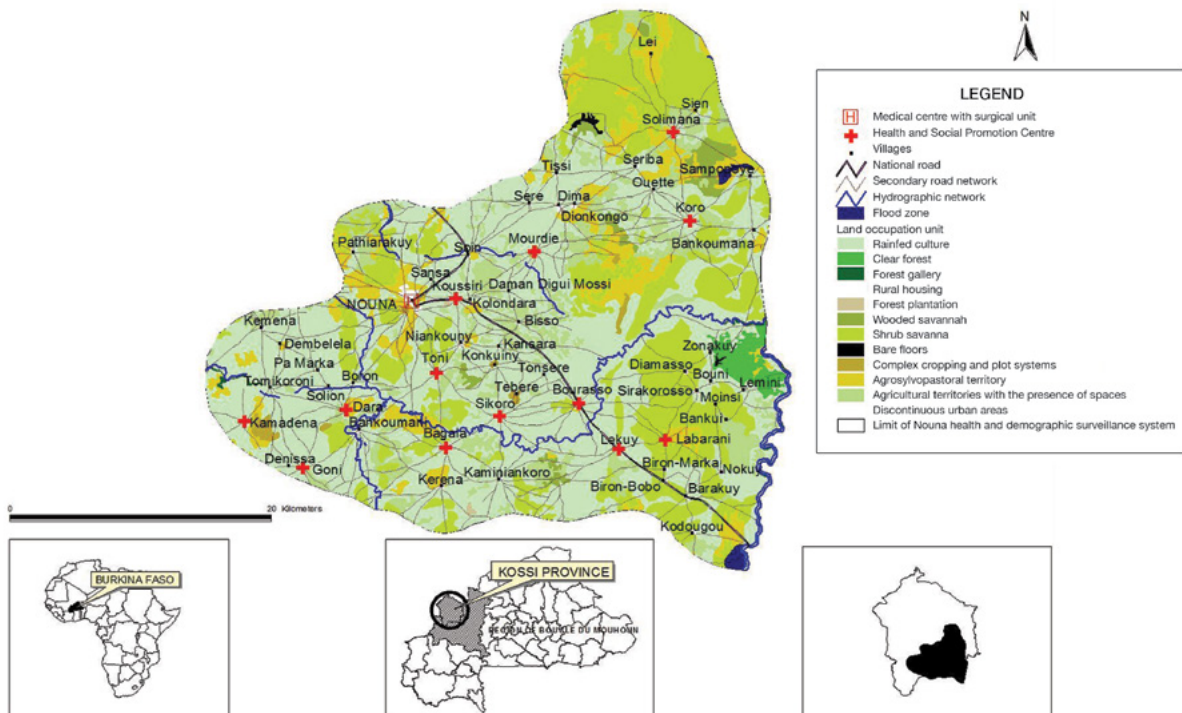
Nouna Health and Demographic Surveillance System

The Nouna Health and Demographic Surveillance System is located in northwestern Burkina Faso, in the Mouhoun Loop region and in the Nouna health district, about 300 km from the capital, Ouagadougou. The Nouna health district is located in a populated savannah woodland; the climate is similar to South Sudan's, with an average annual rainfall of 796 mm (ranging from 483 to 1,083 mm). The main activity is subsistence farming, which keeps more than 80 percent of the active population busy (CRSN 2016). According to figures from the 2012 Nouna Health and Demographic Surveillance System annual report, the main ethnic groups in the area are the Marka or Dafing (37 percent), Bwaba (24 percent), Mossi (18 percent), Peulh (9 percent), and Samo (8 percent). According to the same report, the main language spoken in the area is Dioula. Islam is the dominant religion, practiced by about 62 percent of the population. Holoendemic malaria is the leading cause of death in the area. The Nouna Health and Demographic Surveillance System has 18 health and social promotion centres (CSPS), including a medical centre with a surgical unit (CMA) in the semi-urban area of Nouna. In terms of accessibility to health services, in 2007, distances between villages and health centres ranged from 0 to 34 km (mean: 8.5 km, median: 8 km) (Sie et al. 2010). The median time to reach the nearest health centre on foot is estimated at 75 minutes in the dry season and 90 minutes in the rainy season (Sie et al. 2010). Nouna has grown rapidly in the past decade and has seen a major improvement in access to clean water, electricity, transportation, and, more recently, mobile phones and the Internet. In the semi-urban area of Nouna, nearly half of the population has piped water (CRSN 2016). That area has also been supplied with electricity since 1998. However, many power cuts

occur because production is insufficient to meet demand. In addition, connections by road with the rest of the country have long been difficult, partly because of a poor road network that is impassable during the rainy season, and partly because of the precarious nature of public transportation. However, since 2012, Nouna’s semi-urban environment has been connected to Burkina Faso’s two largest cities (Ouagadougou and Bobo-Dioulasso) by asphalt roads, facilitating connections between the majority of the country’s cities.

The Nouna area has been under demographic and health surveillance since 1992. It had about 106,611 residents in 2015 out of a national population estimated at 18,450,494 in the same year, or 0.6 percent of the total population of Burkina Faso. Since 1992, there has been a visit every four months by fieldworkers to update household information. During their visits, they note any changes in the household, including any demographic events that have occurred since the previous visit. These can be births, new marital statuses, deaths, or migrations. Today, to our knowledge, there are no specific studies on the coverage and completeness of civil registration in the Nouna Health and Demographic Surveillance System. Nevertheless, according to the Report on the Implementation of the 2017 National Civil Registration Strategy Action Plan, the rates of registration of births and deaths within statutory deadlines are 60.8 percent and 20.1 percent, respectively, in the Mouhoun Loop region, where the Nouna Health and Demographic Surveillance System is located.

Map 1: Site of the Nouna Health and Demographic Surveillance System.



Source: Centre de recherche en santé de Nouna (Nouna Health Research Centre), February 2011

Collected data

To identify the constraints to registration of births, marriages, and deaths, we collected data on the supply side (health centres, town halls, and prefectures) and the demand side (households). Quantitative and qualitative data was collected through one-on-one interviews.

Sampling

Our study took place from 19 June to 20 July 2019, and covered 495 births, 332 deaths, and 155 marriages that had taken place in 2015 in the households in the Nouna Health and Demographic Surveillance System. On the supply side, 14 interviews were conducted.

Throughout 2015, there was a total of 3,523 births in the Nouna Health and Demographic Surveillance System (Table 1). These births occurred in 2,990¹ households in all the communities covered by the health and demographic surveillance system (58 villages and the semi-urban area of Nouna). For deaths, we counted a total of 832 in 2015, occurring in 788 households in 55 villages and in the semi-urban area of Nouna. Finally, only data for the first six months of 2015 was available for marriages. There was a total of 561 marriages between January and June 2015 in 542 households in 50 villages and the semi-urban area of Nouna.

Table 1: Number of events in 2015.

	Births	Marriages	Deaths
Number of events	3,523	561	832
Number of households	2,990	542	788
Number of villages covered (including the semi-urban area of Nouna)	59	51	56

Given the above statistics, and the time and resources available, it was almost impossible to cover all 561 marriages, 3,523 births, and 832 deaths over the course of our data collection.

We used a representative sample of all such births, marriages, and deaths. Based on a 5 percent margin of error, a 95 percent confidence level, and an assumed response rate of 70 percent, the numbers of the proposed new study population are shown in Table 2.

Table 2: Proposed study population for data collection: Demand side.

	Births	Marriages	Deaths
Number of events	496	328	370

We conducted a simple random survey in the Nouna Health and Demographic Surveillance System databases to have these numbers in our sample.

¹ There were 3,523 births that occurred in 2,990 households, or more than one birth (about 1.2) per household. Based on this figure, it is likely that twins and other multiples were among the births or that several women from the same household gave birth in 2015.

Stratification of our sample by gender

To highlight gender disparities in the registration of vital events such as births and deaths, we selected a sample of events in which the numbers were evenly distributed between men and women. The same was true for individuals to be interviewed in households. Our sample of people to be interviewed on birth, marriage, and death registration was divided almost equally between men and women. We collected information for 495 births (257 boys and 238 girls). For these births, 272 women were interviewed compared with 223 men. For marriages, we were unable to locate all 328 events in the field that had been sampled. There were some errors in the marriage database, and it was impossible for us to identify some households in the field. Only 155 interviews were conducted with 82 women and 73 men. Finally, we identified 332 deaths (170 men and 162 women). These death registration interviews were conducted with 163 women and 169 men.

Stratification of our sample by place of residence

Of the total number of births registered in 2015 (3,523), 2,849 (81 percent) were in 58 villages, and 674 births (19 percent) took place in the semi-urban area of Nouna. Therefore, to ensure this representation in our study population, 402 births (201 births per gender) in rural areas and 94 births (47 births per gender) in semi-urban areas were sampled. In the field, we conducted interviews on 401 births in rural areas and 94 in semi-urban areas.

Similarly, of all the deaths occurring in 2015 in the Nouna Health and Demographic Surveillance System, 648 (78 percent) occurred in rural areas and 184 (22 percent) occurred in semi-urban areas. Applying these proportions to our new study population, we have 290 deaths (145 per gender) in the rural area and 80 deaths (40 per gender) in the semi-urban area. In the end, we were able to collect data on 253 deaths in rural areas and 79 in semi-urban areas.

Finally, of the 561 marriages that took place in 2015, 473 (84 percent) took place in rural areas and 88 (16 percent) in semi-urban areas. As a result, in our study population, we selected 276 marriages for the rural area and 52 for the semi-urban area. In practice, we were able to provide information on 155 marriages, as previously explained (126 in rural areas and 29 in semi-urban areas).

Supply side study population

Our data collection covered two health facilities (with four interviews), four civil registration offices (six interviews in two town halls and four interviews in two prefectures). Recall that all these health and civil registration structures are set up in the area of the Nouna Health and Demographic Surveillance System.

Data on causes of death

When cause of death is poorly identified, health and demographic surveillance systems use verbal autopsies to collect information. The method is based on questionnaires aimed at tracing the history, duration, symptoms, and treatments of diseases. The 10th Revision of the International Classification of Diseases (ICD10) (WHO 1993–1996) was used to codify the causes of death in the Nouna Health and Demographic Surveillance System. Verbal autopsy is a method

for determining the probable cause of death and, although not perfect, it is the best alternative in the absence of a medical death certificate indicating the cause (De Savigny et al. 2017). For the 332 deaths for which we collected data, we were able to perform a verbal autopsy on 303 (91.3 percent) of them.

Profile of study participants

The participants in this study were identified as follows: One of the two biological parents was used to collect data on the birth registration of the children. The choice of the parent to be interviewed was made randomly when the study sample was drawn to provide an equal number of mothers and fathers, always from a gender perspective. In the event that neither of the biological parents was present (either deceased or on extended leave), we interviewed the child's legal guardian. Information on marriages was collected directly from the people concerned (one spouse per marriage; 1 out of every 2 respondents was a woman). As in the case of births, the choice of the spouse to be interviewed, regardless of the type of marriage, was made arbitrarily when the study sample was selected. For the collection of death data, we addressed the questions to one of the relatives of the deceased. This relative could be the surviving spouse or the head of household for the deceased who were not in a union at the time of death. Participants were asked to complete a request for informed and ongoing consent prior to participating in the study.

For the qualitative survey, participants consisted of all those who agreed to answer the questions on births, marriages, and deaths, and who gave their consent to have their statements recorded. These participants were asked for their views on the advantages of civil registration, the disadvantages of non-registration, and the barriers to civil registration.

Data analysis methods

Independent sample proportion tests and logistic regressions were used for data analysis to highlight factors associated with non-registration of births, marriages, and deaths in vital statistics. The Interpreting Verbal Autopsy (InterVA) method was used to determine causes of death. In a nutshell, the InterVA method gives the probable cause of death based on a set of 106 indicators using a Bayesian principle.

Answers to the qualitative questions were first coded and analyzed quantitatively. We have highlighted the proportions of the different factors that would explain registration or non-registration. The results of this analysis corroborate or qualify the conclusions of the quantitative data analyses on factors associated with civil registration. We then used the verbatim transcripts from the qualitative data to get a better understanding of the civil registration mechanisms in the Nouna area.

Ethical considerations

This research was conducted in accordance with the Tri-Council Policy Statement (TCPS 2): Ethical Conduct for Research Involving Humans, following the core principles of (1) respect for persons, (2) concern for welfare, and (3) justice. We strictly adhered to these ethical standards. IDRC's Advisory Committee on Research Ethics and the Nouna local ethics committee approved the research proposal.

Research results

The following sections will discuss the results of our research. We will deal with the registration of births, marriages, deaths, and causes of death in turn. For each event, we will share how things stand, obstacles, and perspectives.

Birth registration results

Descriptive results

Our results in Table 3 show that only 37 percent of births were registered within the two-month statutory deadline. Few people (13 percent) in our target population had birth certificates issued from court declarations to replace birth certificates (registration of births after the two-month statutory deadline). In addition to other barriers to birth registration, some parents (living exclusively in rural areas) would confuse birth documents issued by health centres with official birth certificates. In fact, 7.7 percent of children had birth documents from health facilities, but their births were never subsequently registered. The prefect (lead authority for the civil registration office responsible for registering births outside the statutory deadline) of Nouna explained this confusion:

“It is when the child is enrolled in school that the parents realize that it is not the legal birth certificate they have, but a mere notification of birth.”

On the whole, households were closer to health centres (maternity wards) than they were to civil registration offices (town halls and prefectures). This proximity of households to health centres partly explains the significant level of childbirths in maternity wards (95.3 percent). Mothers were at the greatest disadvantage when it came to possessing identity documents. Of these women, 81 percent had a birth certificate compared with nearly 91 percent of men. They also fared worse when it came possessing the national identity card (57 percent compared with 89 percent for men).

Table 3: 2015 birth characteristics in the Nouna Health and Demographic Surveillance System in Burkina Faso.

Characteristics	% or mean (standard deviation)			Significance of the differences (boys-girls)	% or mean (standard deviation)		Significance of the differences (rural-semi-urban)
	All	Boys	Girls		Rural	Semi-urban	
Distance to civil registration office	14.7 (0.5)				17.3 (0.5)	2.0 (0.1)	
Distance to maternity ward	3.4 (0.2)				3.7 (0.2)	1.8 (0.1)	
Possession of birth documents							
Acts	37.0	38.2	34.2	ns	30.7	58.5	***
Substitutes	13.1	13.5	14.4	ns	12.2	22.4	**
Certificates	7.7	6.3	9.0	ns	8.7	3.2	.
No documents	41.0	40.3	41.6	ns	47.1	14.9	***
Do not know	1.2	1.7	0.8	ns	1.3	1.0	ns
Childbirth in health centres	95.3				94.3	100	***
Possession of acts of birth by fathers	90.5				90.5	90.4	ns
Possession of identity documents by fathers	89.1				89.5	87.2	ns
Possession of acts of birth by mothers	81.0				77.8	94.7	***
Possession of identity documents by mothers	56.8				50.4	84.0	***
Number	495	238	257		401	94	

Notes: significance: *p<0.10; **p<0.05; ***p<0.01 and ns = not significant

Factors associated with birth registration

Many factors affect registration of births in the Nouna Health and Demographic Surveillance System (Table 4). Living in a semi-urban environment, being close to a civil registration office, and the mother's possession of a birth certificate or identity document are positively correlated with birth registration. There are also cultural factors that affect birth registration. Dafings and Peulhs would register their children's births less than Bwabas. While all of the above factors are generally acknowledged and used to explain children's possession of birth certificates, possession of identity documents has rarely been used in explanatory analyses, yet this variable proves to be very important in birth registration.

The size of the *civil union* modality in the *nature of union* variable was so small (2 percent) that we did not include it in the logistic regression. However, our results show that the children of the 9 people who reported having contracted a civil union all had birth certificates. Similarly, the size of the *childbirth at home* modality in the *place of childbirth* variable was also small (23/495), so we were unable to use the variable in our analysis model. However, we note that the children of the 23 people who gave birth at home had no birth certificates.

Table 4: Factors associated with birth registration.

Explanatory variables	Odds ratio that a child's birth is registered (adjusted standard deviation)
Residence	
Rural (ref)	1.00
Urban	3.26 (1.46)***
Distance to civil registration office	
	0.96 (0.01)***
Ethnicity of the father	
Bwaba (ref)	1.00
Dafing	0.25 (0.20)*
Mossi	0.60 (0.49)
Peulh	0.28 (0.21)*
Samo	0.96 (0.84)
Possession of birth certificates by mothers	
No (ref)	1.00
Yes	3.59 (1.35)***
Possession of identity card by mothers	
No (ref)	1.00
Yes	1.61 (0.40)**

Registration of births after the two-month statutory deadline

We were also interested in birth registration after the two-month statutory deadline. It should be noted at the outset that the procedure for obtaining a birth certificate becomes long and expensive after the two-month statutory deadline. According to section 106 of the *Loi sur le code des personnes et de la famille du Burkina Faso* [Burkina Faso Code of Persons and the Family], when a birth has not been registered within the above-mentioned deadline, the civil registration officer will be able to record it in his or her register only by virtue of a judgement handed down by the civil court (prefecture) in the place of birth. When the birth is registered in the prefectures, birth certificates, national identity cards, or any other valid identity documents held by the parents are required. If the parents are deceased or do not have any identification documents (identity papers, birth certificates, or any other valid documents), four witnesses are called.

In our study, all births that were registered in the prefectures of Nouna and Bourasso (the two civil registration offices authorized to register births after the statutory deadline) during the months of January and February 2019 were counted. The pattern in Figure 1 shows that regardless of gender, the registration level was low among the younger ages, but it peaks in the 10–15 age group and goes back to 0 among the older ages. This maximum registration level observed in the 10–15 age group would be explained by the need for the birth certificate for the first school examination: the Certificat d'études primaires (CEP) [certificate of primary studies]. In addition, the peak observed in the 10–15 age group could also be partly due to misrepresentation of age because the same age would be systematically given to all children in the examination class who do not have a birth document. From these results, we note that in this area, the school does not systematically require the birth certificate when the child is enrolled.

Figure 1: Birth registration after the two-month statutory deadline.



Respondents' knowledge of birth registration

To improve the level of registration, people's attitudes, knowledge, and practices regarding registration must be addressed. Our results (Table 5) show that almost all (99.8 percent) of our respondents were aware that birth registration should have occurred. Unfortunately, this high level of knowledge is not followed by effective registration. The main reason respondents give for not registering births within the statutory deadlines is neglect (51.7 percent). Parents neglect birth registration because they see no immediate benefit. They wait until the year in which the child is due to take his or her first school exam to get the birth certificates. Moreover, the teachers and school principals serve as resource persons for the birth certificates for these children who are in the examination class. In addition to neglect, respondents gave other reasons such as financial constraints (29.1 percent). As a reminder, the majority of the population of the Nouna Health and Demographic Surveillance System (80 percent) engages in subsistence farming, and financial resources are not always available, especially if rainfall has been poor.

Birth registration has direct costs (fees paid to the civil registration office) and indirect costs (transportation, meals, time, etc.). An official from the Nouna prefecture (civil registration office for birth registration after the statutory deadline) said that the costs are as follows:

“The state says it’s free, but we don’t have the printed materials, the paper, the pens, and so on.”

The delay in acquiring a birth certificate was also mentioned by our respondents as one of the deterrents to birth registration. One of our respondents illustrates this problem well with these words:

“You can often go three or four times to the town hall to get the birth certificate and they don’t have it. Every time you go, you have to pay 500 CFA francs for the civil registration officers to look for the birth certificate, and even if they don’t find it, you don’t get your 500 CFA francs back.”

Finally, according to our respondents, community-based health workers (31.5 percent) and municipal councillors (25.3 percent) would be best suited to positively influence birth registration. In light of this information, what recommendations can be made to improve the birth registration in this district in Burkina Faso?

Table 5: Respondents' knowledge of birth registration in vital statistics.

Characteristics	% ^a or mean (standard deviation)			Significance of the differences (men- women)	% or mean (standard deviation)		Significance of the differences (rural-semi- urban)
	All	Men	Women		Rural	Semi- urban	
Knows that birth must be registered	99.8						
Reasons for not having a birth certificate							
Neglect	51.7	53.1	50.5	ns	51.3	57.1	ns
Financial	29.1	34.4	24.3	ns	30.2	14.3	ns
Acquisition time	27.5	33.2	22.8	***	27.2	28.7	ns
Distance	20.8	23.3	18.7	ns	24.7	4.3	***
No documents from the mother	8.9	5.2	12.1	.	7.9	21.4	.
People who can positively influence registration							
Community-based health workers	31.5	33.6	29.8	ns	38.6	1.0	***
Municipal councillors	25.3	23.3	26.8	ns	27.2	17.0	**
Respondents numbers	495	223	272	ns	401	94	

Notes: significance: *p<0.10; **p<0.05; ***p<0.01 and ns = not significant

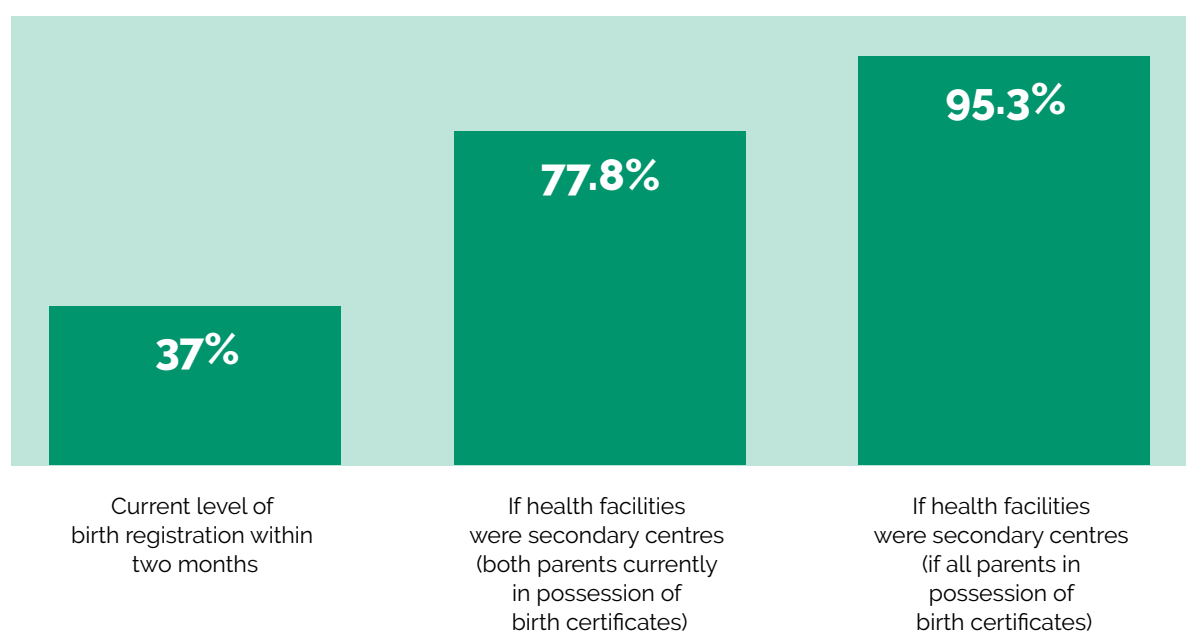
^aWith the exception of the variable on knowledge of birth registration, several choices were possible for the modalities of the variables in the table, with the proportion indicated before each modality corresponding to the ratio of the number of people who chose the given modality on the total number of respondents.

Recommendations to improve birth registration rates

The current procedure for birth registration in Burkina Faso involves health centres issuing birth notification documents. These documents are given to parents so that they can travel to the civil registration office (which is relatively far from the household) to register the birth. This would be one of the main reasons for non-registration of births within the statutory deadlines. Therefore, we propose establishing health facilities as secondary centres for birth registrations. If this were done, results would increase from the current 37 percent registration level to over 95 percent (Figure 2), provided that all parents have birth certificates or other valid identification. In concrete terms, we believe that the civil registration offices could provide birth records to maternity wards, which would be responsible for filling them out. An officer from the town hall would come once a week to collect all the completed registration forms. Birth certificates that are issued could be returned to the health centres, which would be responsible for giving them to the mothers who usually come for postnatal check-ups.

However, our results also showed that not all parents had birth certificates or other valid identification. Since these parental identity documents are needed for birth registration, we recommend providing birth certificates to all parents, mainly mothers, since they were the least likely to possess identity documents (91 percent of fathers had birth certificates compared with 81 percent of mothers).

Figure 2: Potential levels of improvement in birth registration.



Since our respondents identified community-based health workers as the most likely to influence birth registration rates, we suggest engaging them for communication, raising awareness, and registration of births, especially those that take place outside health facilities. Birth registration could be integrated into immunization campaigns, postnatal care, or other outreach activities carried out by community health workers.

Finally, we recommend encouraging and facilitating births in health facilities, because if health facilities become secondary centres for birth registration and all births take place in these facilities, there is hope for achieving 100 percent coverage of birth registration in the long term.

Marriage registration results

Descriptive results

Table 6 provides our survey results related to marriages. The majority (78 percent) of marriages entered into in 2015 in the Nouna Health and Demographic Surveillance System were monogamous. Of the 73 men interviewed, 9 (12.3 percent) had married before the legal age of 20. Among the 81 women interviewed, 16 (19.8 percent) had married before the legal age of 17. These results show the phenomenon of early marriage in the study area. The numbers may be underestimated because of the very likely scenario that ages for individuals whose births were not registered within the two-month statutory deadline were misreported. Not surprisingly, the average age at marriage for women (18.7 years) is significantly lower than that for men (28.3 years). There is close to a 10-year gap between the two average ages. In the Nouna Health and Demographic Surveillance System, it is rare for a marriage to be celebrated at the town hall. Only a minority (2 percent) of marriages were celebrated before a civil registration officer. Religious marriage is most common (77 percent) in the area. Even when respondents had a choice between the different types of unions, the majority chose religious marriage (66 percent). Similarly, the largest number (61 percent) of our respondents would like to see religious marriage registered and recognized in the same way as civil union. One of our respondents had this to say:

"I chose religious marriage because of my religion, the religious recommendations, the Koran. Religious leaders persuade us to choose religious marriage. Traditional marriage is less formal. I prefer that religious marriage be registered because it's more formal."

In light of these results, what are the prospects for marriage registration?

Table 6: Characteristics of marriages taking place in 2015 in the Nouna Health and Demographic Surveillance System in Burkina Faso.

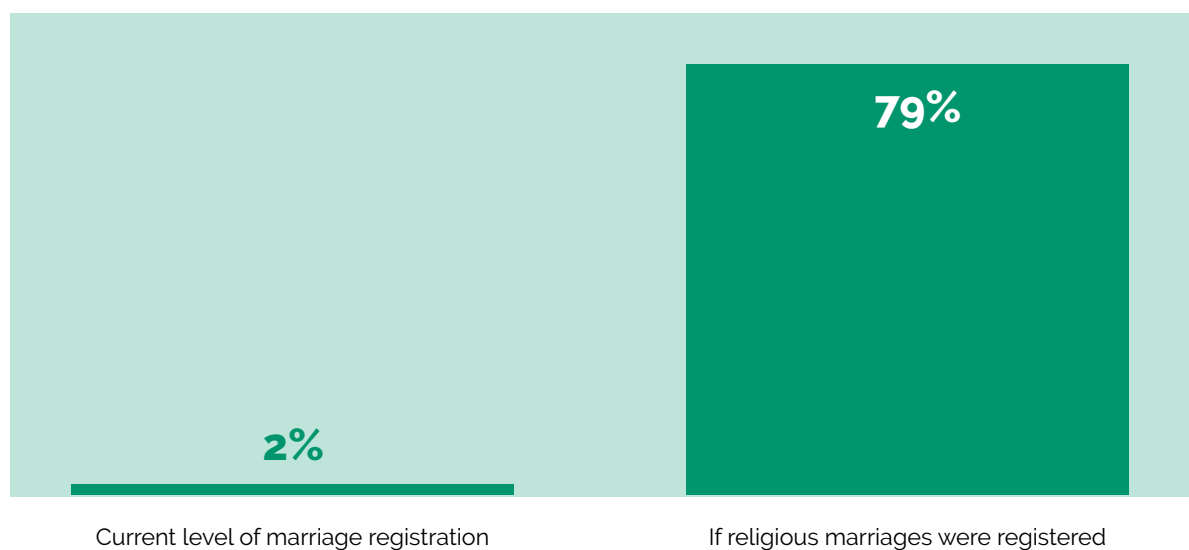
Characteristics	% or mean (standard deviation)			Significance of the differences (men-women)	% or mean (standard deviation)		Significance of the differences (rural-semi-urban)
	All	Men	Women		Rural	Semi-urban	
Marital status (monogamy)	78.7	76.7	80.5	ns	78.6	79.3	ns
Nature of unions							
Civil	1.9	2.7	1.2	ns	2.4	0.0	ns
Religious	77.4	71.2	82.9	*	73.8	93.1	**
Traditional	18.7	23.3	14.6	ns	22.2	3.4	**
Free union	2.0	2.8	1.3	ns	1.6	3.5	ns
Average age at marriage	23.3 (0.7)	28.3 (1.1)	18.7 (0.4)		23.5 (0.8)	22.2 (1.5)	
Knows other type of marriage²							
Religious	93.9	89.5	100	ns	93.6	100	ns
Civil union	77.5	78.0	76.9	ns	76.8	80.0	ns
Traditional	47.4	56.8	39.0	ns	50.8	36.8	ns
Choice of marriage type							
Religious	65.8	67.1	64.6	ns	65.9	65.5	ns
Civil union	20.0	17.8	22.0	ns	17.5	31.0	*
Traditional	7.7	9.6	6.1	ns	9.5	0.0	*
Yes to traditional marriage registration	46.5	39.7	52.4	ns	46.8	44.8	ns
Yes to religious marriage registration	61.3	58.9	63.4	ns	61.9	58.6	ns
Respondent numbers	155	73	82		126	29	

Notes: significance: *p<0.10; **p<0.05; ***p<0.01 and ns = not significant

Recommendations to improve marriage registration rates

In Burkina Faso, the only marriages that are currently subject to civil registration are those celebrated before the civil registration officer. If marriages are to be subject to civil registration, the solution would be to recognize the legality of religious marriage, which would be in keeping with on-the-ground realities (61 percent of our respondents would like religious marriage to be registered). Burkina Faso could learn from the successful experiences of countries that have already recognized religious marriage, like Mali. If religious marriage were recognized in the Nouna Health and Demographic Surveillance System, the current level of registration would increase from 2 percent to 79 percent (Figure 3).

2 The question was whether the respondent knew of any type of union other than the one he/she had entered into. For example, for someone who has entered into a religious union, we wanted to know if he or she knew of any other type of marriage other than religious marriage.

Figure 3: Potential levels of improvement in marriage registration.

Death registration results

Descriptive results

Table 7 provides a portrait of the deaths that were the subject of our data collection. Death registration does not seem to be the best-shared subject in the Nouna Health and Demographic Surveillance System. Only 2.7 percent of the deaths occurring in 2015 in the area were reported to the civil registration office. Yet 30.4 percent of these deaths had occurred in health facilities. Of the deaths that took place in health centres, 13 percent occurred in the Centres de Santé et de Promotion Sociale (CSPS), or health and social promotion centres, and 17 percent in the Centre médical avec antenne chirurgicale (CMA), or medical centre with surgical unit, the reference hospital. The proportions of men who died in the reference hospital was significantly higher than women. It appears that men have a higher propensity for better care than women. In the Nouna area, as in most rural patriarchal societies in Africa, men still hold almost all the economic resources because of gender relations and the prevalence of customs and habits. This automatically confers the status of "head of household" on them and decides who deserves better care in case of illness. Often priority is given to men regardless of age.

The majority (64.5 percent) of deaths in this community occur at home. However, households are relatively close to health centres (3.4 km). In addition to cultural considerations, there may be financial constraints and issues accessing health facilities (road conditions during the rainy season).

All age groups were represented in our sample. Not surprisingly, mortality for children under 5 is significantly higher in rural areas than in semi-urban areas (41.1 percent of deaths in rural areas involved children under 5 years of age, compared with 12.7 percent in semi-urban areas). Conversely, the largest number (76 percent) of people who died in urban areas was over 50 years of age, compared with only 41.5 percent in rural areas. These results indicate higher life expectancy in semi-urban areas compared with rural areas.

It was difficult to perform a multivariate analysis with all explanatory variables related to the low numbers of deaths reported in the civil registration system. However, place of residence appears to be an important factor in death registration because the deaths that were registered were exclusively those of people who lived in semi-urban areas. In addition, a high level of education, access to economic resources, dying in a health centre, and being older would make it more likely that a death is registered.

Table 7: Characteristics of deaths in 2015 in the Nouna Health and Demographic Surveillance System in Burkina Faso.

Characteristics	% or mean (standard deviation)			Significance of the differences (men-women)	% or mean (standard deviation)		Significance of the differences (rural-semi-urban)
	All	Men	Women		Rural	Semi-urban	
Gender of the deceased							
Male	57.3						
Female	42.7						
Residence							
Rural	68.2						
Semi-urban	31.8						
Average distance to a civil registration office	13.3 (0.9)				17.9 (1.0)	1.8 (0.1)	
Distance to the health centre	3.4 (0.2)				3.7 (0.2)	1.8 (0.1)	
Age groups							
<1 year old	13.3	12.9	13.6	ns	14.6	8.9	ns
Age 1-4	21.1	20.6	21.6	ns	26.5	3.8	***
Age 5-14	5.1	5.3	5.9	ns	5.9	2.5	ns
Age 15-49	10.8	8.8	13.0	ns	11.5	8.9	ns
Age 50+	49.7	52.4	46.9	ns	41.5	76.0	***
Possession of acts							
Death certificates	2.7	4.1	1.2	ns	0.0	11.4	***
No documents	94.9	93.5	96.3	ns	97.6	86.1	***
Do not know	2.4	2.4	2.5	ns	2.4	2.5	ns
Place of death							
CMA	17.2	21.8	12.4	**	14.6	25.3	**
CSPS	13.2	12.3	14.1	ns	16.2	3.6	***
Home	64.5	61.2	67.9	ns	64.8	63.3	ns
Other places	5.1	4.7	5.6	ns	4.4	7.8	ns
Respondent numbers	332	170	162		253	79	

Notes: significance: *p<0.10; **p<0.05; ***p<0.01 and ns = not significant

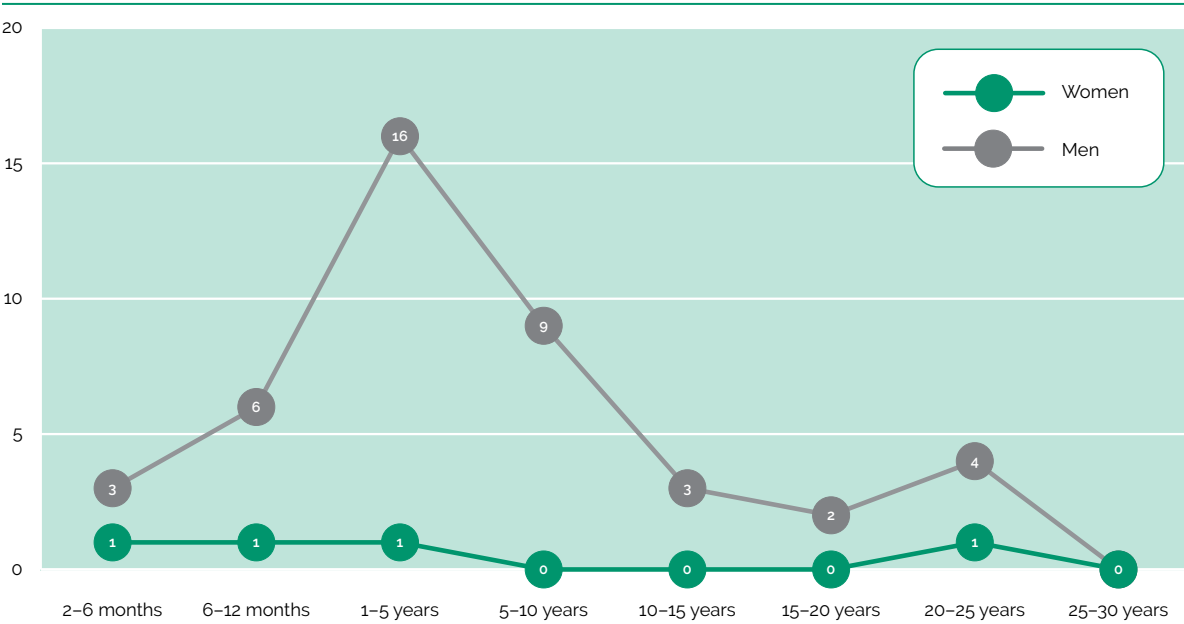
CMA: Centre médical avec antenne chirurgicale [medical centre with surgical unit]

CSPS: Centre de Santé et de Promotion Sociale [health and social promotion centre]

Registration of deaths after the two-month statutory deadline

All deaths registered in the prefectures of Nouna and Bourasso in the 12 months prior to the study (June 2018–July 2019) were recorded. In total, we counted 43 male deaths compared with only 4 female deaths (Figure 4). The majority of deaths were reported in the 1–5 age bracket. These results show that registration of male deaths is far more frequent in this community. Here again, the most plausible explanation is that men hold almost all the economic resources (plots of land, orchards, bank accounts, private income, etc.). In our study area, it would appear that death certificates are drawn up only for people who leave behind an inheritance.

Figure 4: Number of death certificates according to the time between death and declaration of death.



Respondents' knowledge of death registration

Table 8 details our respondents' knowledge of death registration. While almost all of our respondents (99.8 percent) knew that births should be legally registered, only 7 percent of our respondents were aware of death registration. We were not surprised by the low death registration rate in view of the widespread lack of knowledge of death registration. The main reason for non-registration of deaths is, not surprisingly, ignorance of its importance (30.4 percent). Other reasons were cited by respondents for not registering deaths, including costs. It should be noted that very few deaths are registered within the two-month statutory deadline. When the death must be registered outside the deadline, the costs can be expensive. There are many steps to follow before a death certificate is issued. According to our interview respondents, the people who are most likely to influence death registration rates are municipal councillors (39.1 percent) and customary and religious authorities (17.4 percent).

Table 8: Respondents' knowledge of death registration.

Characteristics	% ^a or mean (standard deviation)			Significance of the differences (men-women)	% or mean (standard deviation)		Significance of the differences (rural-semi-urban)
	All	Men	Women		Rural	Semi-urban	
Respondents' gender							
Male	55.4						
Female	44.6						
Know that the death must be registered	6.9	7.7	6.1	ns	2.3	20.3	***
Respondents numbers	332	169	163		253	79	
Reasons for the absence of death certificates							
Ignorance of importance	30.4	30.8	30.0	ns	28.6	31.3	ns
Cost	26.1	30.8	20.0	ns	22.2	28.6	ns
Communication deficit	17.4	23.1	10.0	ns	33.3	7.1	ns
People who can positively influence registration							
Municipal councillors	39.1	46.2	30.0	ns	77.8	14.3	***
Customary and religious authorities	17.4	15.4	0.0	ns	22.2	14.3	ns
Respondents numbers	23	13	10		7	16	

Notes: significance: *p<0.10; **p<0.05; ***p<0.01 and ns = not significant

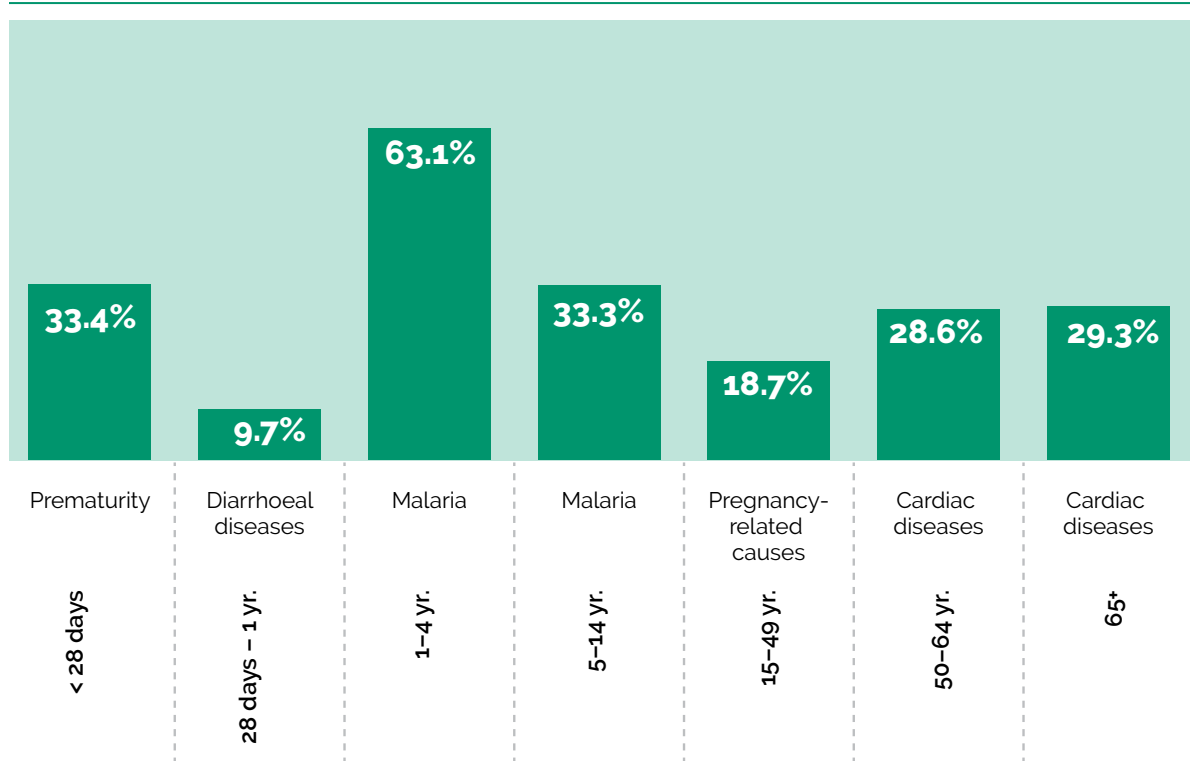
^aWith the exception of the variable on knowledge of death registration and the respondents' gender, several choices were possible for the modalities of the variables in the table, with the proportion indicated before each modality corresponding to the ratio of the number of people who chose the given modality over the total number of respondents.

Causes of death

As a reminder, of the 332 deaths for which we collected data, we were able to perform a verbal autopsy on 303 (91.3 percent) of them. Causes of death were determined using the InterVA method. Analysis of causes of death showed that young people died more of communicable diseases while the majority of elderly deaths were from noncommunicable diseases (Figure 5). Malaria is thought to be the leading cause of death among children under 15, while among people over 50, cardiovascular disease seems to prevail over other causes of death. As is still the case in most sub-Saharan countries, women continue to die trying to give birth. In the 15–49 age group, the leading cause of death is pregnancy-related illnesses.

With all this information on the registration of deaths and their causes, what recommendations can we propose?

Figure 5: Leading causes of death by age group.



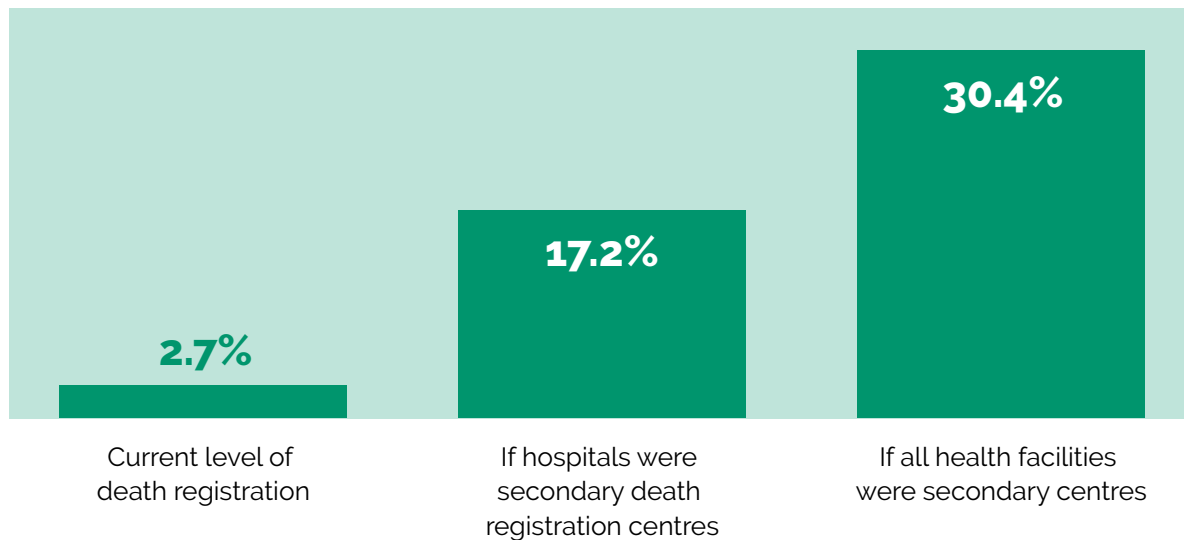
Recommendations to improve death registration

As with birth registration, the current procedure for death registration consists of the issuance of death notification documents by health centres at the request of the parents of the deceased. These documents are given to the relatives of the deceased so that they can go to the civil registration office to register the death. From our point of view, this hinders the registration of all deaths. In light of this, our first recommendation would be to establish health facilities as secondary centres for death registration. If all health centres were death registration centres today, this would increase the death registration rate from 2.7 percent (current level) to 30.4 percent (Figure 6). In addition, the registration of deaths in health facilities would help to partially resolve the under-registration of deaths of children and women. According to our results, 50 percent of the deaths that take place in health facilities involve children under 5 and the same proportion (50 percent) are female deaths.

In practical terms, civil registration offices could provide death registers to the health centres, which would be responsible for filling out the death records. An officer from the town hall could come once a week to collect the completed forms and go to the main office to register the death. Unlike birth certificates, which can be given to mothers of newborns during postnatal visits, death certificates could be given to municipal councillors, who would send them to the parents. Regular municipal council meetings are held in town halls, and municipal councillors could take advantage of this trip to retrieve all the death certificates from people under their authority.

To better combat morbidity and mortality, it is essential for causes of death to be reported on death certificates; currently this is not happening. To avoid possible stigmatization, the causes of death could be indicated only on the copy of the death certificate to be archived with civil registration services. In other words, the copy to be given to the parents through the municipal councillors will not mention the cause of death. Furthermore, given that the majority of deaths still take place at home, a strategy would be needed to determine the causes of deaths occurring at home. This would help provide an overall picture of all the causes of death and in setting up an effective policy to combat morbidity and mortality.

Figure 6: Potential levels of improvement in death registration.



Our second recommendation to improve death registration is to collaborate with municipal councillors (who are the most influential in this area) and community-based health workers on communicating, making people aware of, and undertaking registration of deaths, mainly those that take place outside health facilities. These councillors are opinion leaders and well aware of almost all vital events in their home communities. A strategy could be considered in collaboration with these municipal councillors and community-based health workers to improve death registrations.

The third recommendation is to promote visits to health centres through communication, financial incentives, and location accessibility, etc. Our results indicated that deaths occur more at home during the rainy season because it is almost impossible to reach health centres. If the level of visits to health centres was increased and these structures became secondary centres for the death registrations, in time we can count on seeing all or most deaths registered.

Finally, with regard to causes of death, our results showed that the population of the Nouna Health and Demographic Surveillance System died from communicable and noncommunicable diseases. In a context where the health system has long been oriented toward communicable diseases, consideration should be given to providing geriatric services that can effectively meet the health needs of the elderly, for whom chronic diseases may become increasingly severe — in Africa and elsewhere.

Conclusion

This study on the registration of births, marriages, deaths, and their causes has demonstrated the dysfunction of the civil registration system in our study area, in particular, and throughout Burkina Faso in general. The country is far — very far — from the universality of vital events registration (births, marriages, and deaths), and there are still disparities in the level of registration among these three events. Births are best registered at the civil registration office in this district, while marriages and deaths have almost the same level of registration. The main obstacle to birth and death registrations appears to be the lack of secondary civil registration offices. For marriage registration, the fact that only marriages celebrated before the civil registration officer is not in keeping with on-the-ground realities. To overcome these obstacles, the most critical solutions include establishing health centres as secondary centres for birth and death registrations, and recognizing the legitimacy of religious unions in the same way as civil unions.

We have also noted that Burkina Faso's civil registration legislation seems limited because it does not allow important information, such as causes of death, to be registered. Yet, as noted above, the level of mortality by cause is a crucial element in planning population health interventions. It is therefore imperative to improve the legislative, regulatory, and institutional civil registration framework by updating the *Code of Persons and the Family*.

While we have made recommendations to governments and their partners, it is also important for us to make a personal commitment to doing our share. To achieve this, we will share the results of our research with the ministries in charge of civil registration and health to encourage them to take action together. While our results are not representative of the entire territory of Burkina Faso, similar studies are underway in other health and demographic surveillance systems in Burkina Faso, and the results of these studies will allow stakeholders to design new strategies for improving civil registration rates. These new strategies could be implemented in health and demographic surveillance systems, where evaluation is easy because of continuous data collection. To make evaluation easier, we will encourage health and demographic surveillance systems to administer a few specific questions on the coverage and completeness of vital events during their routine data collection. Finally, if the evaluation results are conclusive, these new strategies could be implemented throughout the national territory (if the political will is there) to improve the level of coverage and completeness of vital events registration.

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