

## SITUATIONAL ANALYSIS OF MATERNAL DEATHS IN THE REGION OF AGNEBY-TIASSA-ME FROM JANUARY TO DECEMBER 2016 IN CÔTE D'IVOIRE

### Abstract:

The aim of our work is to appreciate the extent of this public health problem in the health region of Agnéby-Tiassa-Mé through routine surveillance on the national reporting platform (magpi) during the year 2016. It is a descriptive retrospective cross-sectional study of maternal death reporting and review data in the 6 health districts of the Region in 2016. In addition, using questionnaires called "maternal death notification form in the middle" hospital "and" maternal death notice at community level ", these data were collected from women of reproductive age in the region. These are women in pregnancy or postpartum who were received in health facilities or in the community at the health region level during the period. Data collection was from January 2016 to December 2016.

The following results were reported: 68 maternal deaths reported in the health region, 53% of deaths in the administrative region of Mé and 47% in Agneby-Tiassa. Maternal deaths reported in the health region in 2016 represent 5.25% of cases nationally. The average notification period at the regional level is 10 days with a variation from 0 to 115 days.

The age groups most affected are those between 20-29 years old (30%) and 30-38 years old (23%); 41% of deaths occurred in the immediate postpartum followed by the period of pregnancy with 33%; 90% of maternal deaths occurred within the facility; hemorrhage is the leading cause of maternal deaths reported in the region (34%) followed by anemia (13%); Half of the maternal deaths occurred between 6 pm and 7 am in the morning corresponding to the guard period in the structures (49%); 29% of children are born alive.

Reviews of all deaths should be systematic in the region according to national guidelines so that all determinants of maternal deaths can be better understood. Efforts still need to be made to improve the situation and achieve the goal of safer motherhood.

**Keywords:** Maternal death; health region; situational analysis; maternal health; Agnéby-Tiassa-Mé; Côte d'Ivoire

### 1.Introduction:

The 2015 Maternal Mortality Report (RMM) estimated Côte d'Ivoire's maternal mortality rate at 645 deaths per 100,000 live births as against 546 for sub-Saharan Africa. [1]In 2012 at the national level, the rate of deliveries attended by skilled staff was low (54.65%) compared to the national target of 80% and varied across health regions. These rates are 39% in Boukani-Gontougo, 38% in Gbêkè, 40% in Tonkpi, 42% in Cavally-Guemon and 45% in Haut-Sassandra. [2]. The health region of Agneby-Tiassa-Mé is no exception because it recorded an increase in home births of 19 to 25% between 2015 and 2016.. [3] Given this high number of maternal deaths, it was urgent to conduct a situational analysis of maternal deaths in the Agneby-Tiassa-Mé health region from January to December 2016 to identify factors related to maternal death. The aim was to review the organization of the maternal death collection system, to analyze the determinants of maternal deaths and to propose corrective actions to reduce maternal deaths.

## **2. Methodology:**

### **2.1. Framework of the study**

The study was conducted in the 6 health districts of Agnéby-Tiassa-Mé Region. The health region includes 2 administrative regions, namely the regions of Agneby-Tiassa and Mé, and covers 8 departments, 33 sub-prefectures, 12 communes and 332 villages. According to estimates of the National Institute of Statistics, the total population in 2016 of the health region, located in the south-east of Cote d'Ivoire was 1,179,575 inhabitants with a density of 67 inhabitants per square kilometer. 77% of the population lives within 5 km of a health facility of first contact compared to 44% at the national level. The population living between 5 and 15 km from a health center represents 17%, and 6% must travel more than 15 km to access a health facility. Logistically, 27% of vehicles and ambulances are in poor condition. Regarding human resources: There are 114 doctors is a ratio of 1 physician / 10 347 inhabitants, 444 nurses or 1/2 656 inhabitants, 234 midwives is 1/795 FAR and 4 Obstetric Gynecologists is 1/43 547 FAR.

### **2.2. Type of study**

It is a retrospective descriptive cross-sectional study of maternal death reporting and review data in the 6 health districts of the Region in 2016.

### **2.3. population**

These are women in pregnancy or postpartum who were received in health facilities or in the community at the health region level during the period.

### **2.4. Technical and data collection tools**

Data were collected using questionnaires referred to as "maternal hospital death notice" and "maternal death notice at community level"

### **2.5. Organization of data collection**

The data was collected in the software called "MAGPI" of the Ministry of Health and Public Hygiene. Cases of death are reported immediately on this platform using smartphones made available to epidemiological surveillance officers in each health district in the country. This notification is made taking into account the items contained in the national notice of maternal deaths. Data collection was from January 2016 to December 2016.

#### **• Inclusion criterion**

Any woman who dies and is registered in services during pregnancy, childbirth or within 42 days after delivery and whose cause of death is neither accidental nor accidental.

#### **• Criteria of non-inclusion**

Any woman who is dead and registered in services outside pregnancy, childbirth or 42 days after childbirth

### **2.6. Data processing and analysis:**

A manual review was done for the analysis and processing of the maternal death review data to verify concordance, completeness of data and errors. Data processing and analysis were done with the Excel software (calculations, tables and graphs).

### **2.7. Difficulties of the study:**

Some of the items on the maternal death notification cards and the review sheets are not filled in. This did not allow us to exploit the completeness of the data.

### **2.8. Ethical considerations**

The subjects in the study were interviewed after informed consent. We are committed to respecting the anonymity of individuals and the confidentiality of information collected, ethical considerations for research involving human subjects. Each participant was informed that his participation was voluntary and that he was free to terminate his consent at any time during the study.

### 3. RESULTS AND DISCUSSION

#### 3.1 Organization of the maternal death case collection system

Maternal death data are immediately reported on the maternal death notice and then by Smartphone directly on the platform. Indeed the health structures notify the District which in turn relays on the platform via the Smartphone. A review is then conducted to support the circumstances of death for corrective action. The case collection sheets and the maternal death review templates are filled in, archived at the health center and a copy sent to the district. The district in turn sends a copy to the Regional Directorate.

#### 3.2. Notification of maternal deaths

- 68 maternal deaths reported in the health region
- 53% of deaths were reported in the administrative region of the Mé and 47% in that of Agneby-Tiassa
- Notifications made in the health region of Agneby-Tiassa-Mé account for 5.25% of all notifications in the country.
- Weekly average of 1, 3 deaths (or 5.7 deaths per month).
- 90% of maternal deaths occurred within the facility
- 66% of design products are not life
- 29% of children are born alive
- As of May 2016, a constant record of at least 6 deaths per month with one of the peaks in August (11 cases) and September 2016 (14 cases).

In the Agnéby-Tiassa-Mé health region, 68 cases of maternal deaths were identified in all 6 districts, giving us a maternal mortality rate of 156 deaths per 100,000 live births. Compared to the national level (645 deaths per 100,000 live births in 2015), the figures are lower in the Agnéby-Tiassa-Mé region. [4]

Two districts are distinguished by the high numbers of deaths, this is Agboville 31% and Adzopé 26% of reported deaths in the region. These figures are explained by the fact that these two cities are chiefs-lieu of our two administrative regions: Agboville, for that of Agneby-Tiassa which houses the Regional Hospital Center and Adzopé, for the administrative region of Mé. Moreover, in the immediate vicinity of Adzopé, the operating theater of the department of Akoupé is not functional and that of the department of Yakassé - Attobrou, functional but without a gynecologist; also the cases are they referred to Adzopé.

In addition, the 2016 activity report of the Regional Office shows a persistence or even an increase in home births of 19 to 25% between 2015 and 2016 in the region [5], as well as a shortage of specialized human resources, particularly gynecologists. Indeed, in the administrative region of the Mé with its 4 health districts, there is only one gynecologist stationed in Adzopé. [6]

As for the General Hospital of Sikensi, it has no operating room and parturients with complications during delivery are referred to the Yopougon University Hospital, more accessible than the Agboville Hospital (more isolated). In our study, the following observation emerges: the number of maternal deaths increases from May to September, a period that can be superimposed on the rainy season with its corollary of difficult roads. It was recorded on average during the year 2016, 6 deaths per month, a weekly average of 1.3 deaths per week. Maternal deaths are most common in the 20-29 age group (30%) followed by the 30-39 age group (23%). The average age is 29 years old with extremes of 14 years old and 46 years old. These results are consistent with those of the national monitoring service of maternal deaths of the INHP of Côte d'Ivoire in

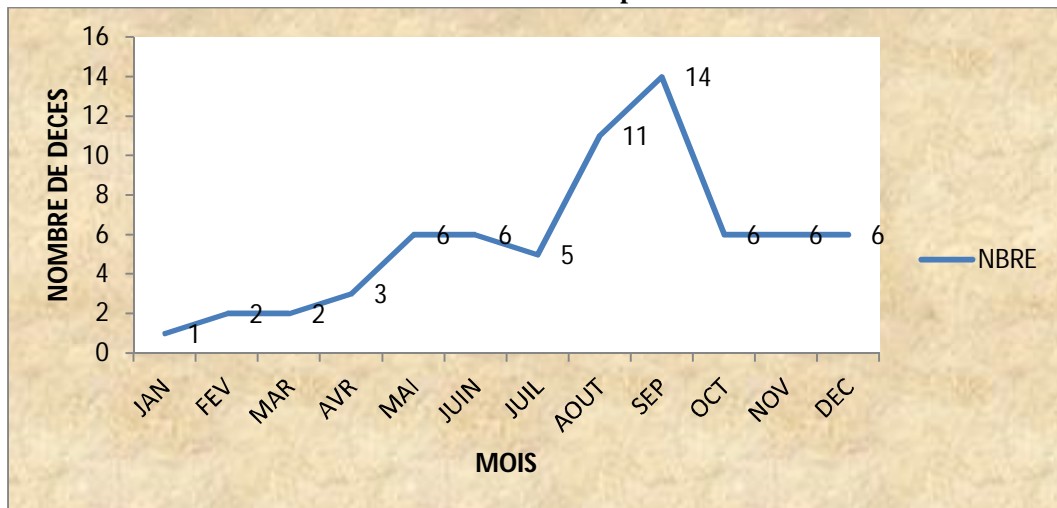
January 2016 which records an average age of maternal deaths is 29.31 ( $\pm$  7.95) years with a minimum of 14 years and a maximum of 45 years. [7]

On the other hand, Fomulu J.N in the retrospective study on maternal mortality at General Hospital of Yaoundé from 2002 to 2006 finds a higher average age. Indeed, the majority of deaths occurred in young women whose average age was 21.5 years with extremes of 18 and 25 years [8]. Tunisia conducted a National Survey in 2010 to estimate the maternal mortality ratio (RMM) at the national and regional levels and to identify the causes and determinants of this mortality. In this study, the average age of deceased women was 35 years, which is significantly higher than that found in our study. [9]. A finding was also made in our study, there were fewer deaths before age 20 (7%) and after age 40 (8%) and deaths occurred mainly in the immediate postpartum (41%) followed pregnancy (33%) and during delivery (19%) Our classification is different from that observed in the report of the National Maternal Death Surveillance Service (INHP) who observed that 55% deaths occur in the immediate postpartum compared to 12% at delivery in January 2016 and 49% in the immediate postpartum compared to 11% during pregnancy in February of the same year. [10] The high death rate (41% immediate postpartum and 7% late postpartum 48%) in our study is relatively lower than that of the BOHOUSSOU et al study (58.50% recorded in diaper suites). [11] Fomulu JN in the retrospective study of maternal mortality at the General Hospital of Yaounde from 2002 to 2006 found a figure higher than that of our study, indeed according to their study 55.6% of the cases, the deaths took place in the postpartum period. [12]. The majority of maternal deaths reported in 2016 in the health region occur within the facility (90%). However, it is noted that 4% took place in the community and 4% during the evacuation. Our data differ from those of the 1988 Bohoussou M K et al study on maternal mortality in Abidjan (96% of maternal deaths occur in Reference Hospitals) [13]. The data in our study are also different from those observed at the national level. Indeed, in January 2016, it was found during the monitoring of maternal deaths in Côte d'Ivoire that 82% of maternal deaths notified occurred in health care facilities. compared to 5% in the community and February 2016 87% in the care facility versus 2% in the community. This high rate of maternal deaths in these hospitals can be explained, in part, by the late reference in case of emergency of parturients related to either the lack of knowledge of the danger signs by some providers or the unavailability of means of locomotion for the transfer of the parturient (ambulance) or the insufficiency of blood products. Causes of maternal death are multifactorial. In our study, the main causes of maternal deaths are identified and in the region in descending order are hemorrhages (34%), anemia (13%), obstructed labor (7%) and eclampsia (6%). The study conducted by RT Dellagi et al found a different classification with, however, hemorrhage in the first line. In this study, the main cause of maternal death was hemorrhage (30.8%), followed by eclampsia and toxemia (11%). National surveillance identifies hemorrhages as the leading cause of maternal deaths, with 47% in January and February 2016. [14] Tunisia conducted a National Survey in 2010 to estimate the National Maternal Mortality Ratio (MMR) by region and this helped to identify the causes and determinants of this mortality. Thus, the main cause of death identified is that of our study, that is hemorrhage (3 times / 7), but the rest of the classification is different with embolic disease (2/7), then the HELLP Syndrome. (1 time / 7) [15]. The classification of Fomulu JN in the retrospective study on maternal mortality at Yaounde General Hospital 2002 to 2006 is also different and eclampsia is the main cause. The main causes of maternal deaths were eclampsia (33.4%), hemorrhage (22.2%), post abortum sepsis, HIV infection, pulmonary embolism and accident. anesthetic (11.1% each). [16] Most of these are preventable causes. In our study, it was found that the majority of maternal deaths occurred between 6 pm and 7 am corresponding to the the guard period of the teams. (49%).

These hours correspond to the period when the number of service personnel is very reduced. Other factors that could contribute to this state of affairs include the reduction of the means of travel at these hours, the pharmacies on duty which are sometimes far from the hospital etc ... As for the design product, 66% died and 29% were born alive. Our results are different from those reported by the National Maternal Death Surveillance System, which reports 41% of the design products that were not alive versus 40% alive. [17]

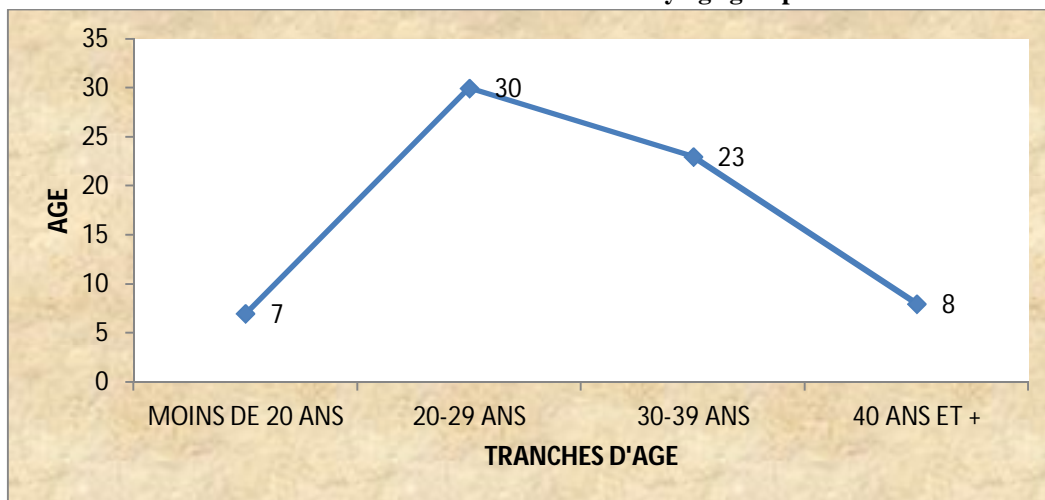
The notifications are immediate but in our study, only the notification of cases of death at the level of the Tiassalé DS are made in the standards. The notification deadlines range from 0 to 115 with the highest average 60 days in the Alépé DS. At the level of the health region, the average time (celerity) is 10 days. In Tunisia, a similar study on Evaluation of the system of monitoring maternal deaths in public structures was conducted by Dellagi over the period of 1999-2004 and these results join ours. Indeed, according to this survey, in the context of the speed with which maternal deaths are reported, the median of the declaration of maternal deaths is 10 days in 1999 compared to 8 days in 2004. [18]

**Chart 1: Distribution of maternal deaths per month in 2016**



- The age groups most affected are those between 20-29 years old (30%) and 30-38 years old (23%).

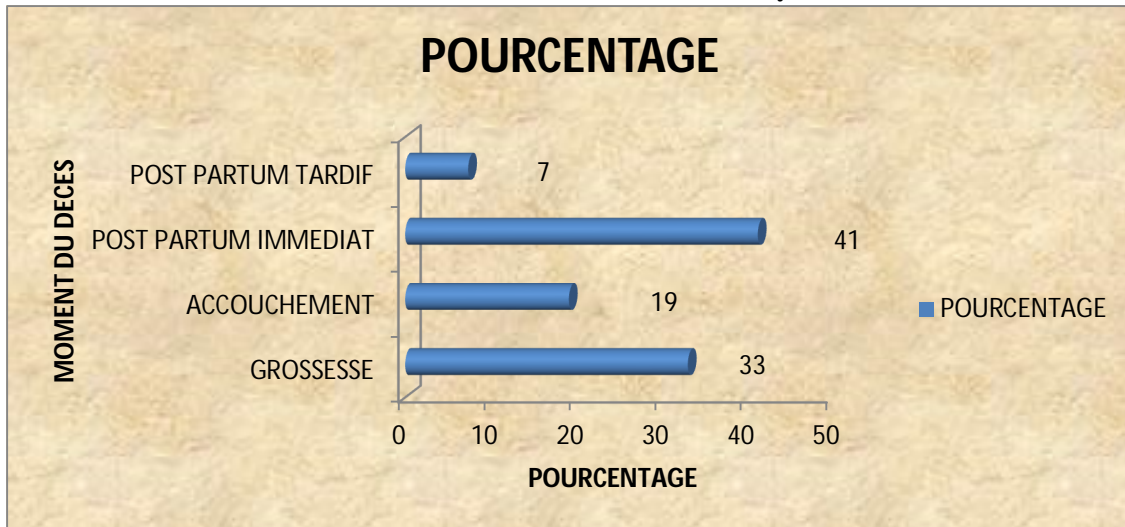
**Chart 2: Distribution of maternal deaths by age group in 2016**



41% of deaths occurred in the immediate postpartum followed by period of pregnancy with 33

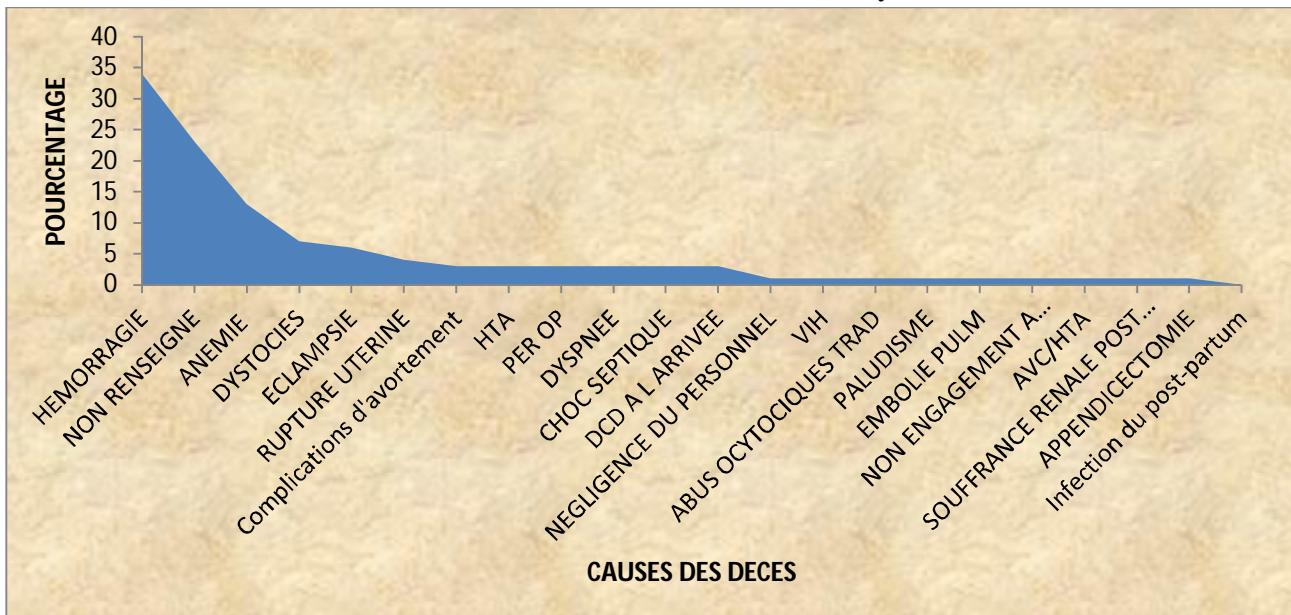


**Chart 3: Distribution of maternal deaths by time**



- Hemorrhage is the leading cause of maternal deaths reported in the region (34%) followed by anemia (13%).

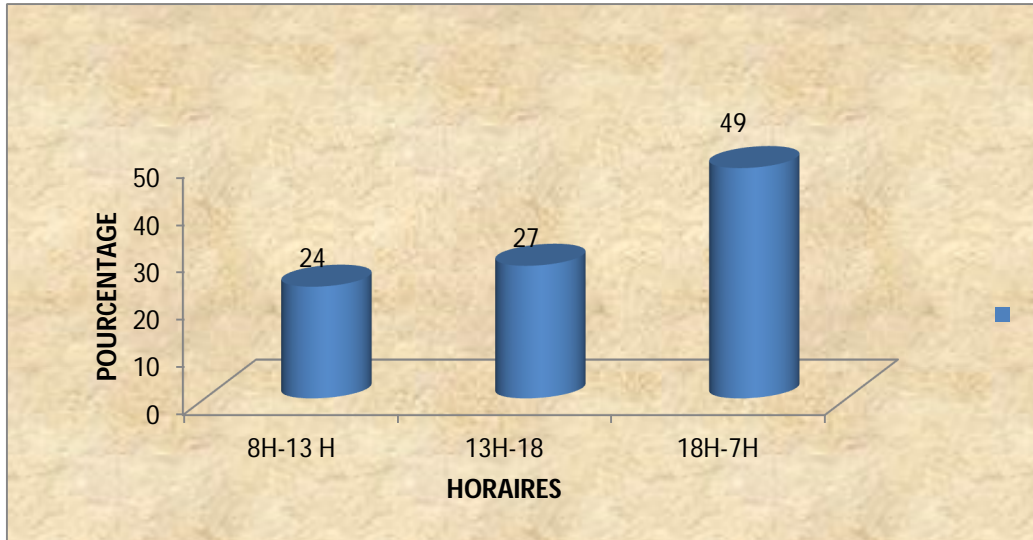
**Chart 4: Distribution of maternal deaths by cause**



- Half of the maternal deaths occurred between 18:00 and 7:00 in the morning corresponding to the period of care in the structures (49%).



**Chart 5: Distribution of maternal deaths by work schedule**



- Longest average reporting time: DS Alepé with 60 days and the shortest with Tiassalé 0 Day with a variation from 0 to 115 days.

**Table 1: Reactivity to notification of maternal deaths on the platform by the health districts**

MEDICAL DISTRICT	AVERAGE (DAYS)	INTERVAL FOR NOTIFICATION (DAYS)
AKOUBE	6	1-42
<b>ALEPE</b>	<b>60</b>	<b>0-115</b>
ADZOPE	3	0-17
SIKENSI	3	1-2
AGBOVILLE	6	0-25
<b>TIASSALE</b>	<b>0</b>	<b>0-0</b>
<b>TOTAL REGION</b>	<b>10</b>	<b>0-115 DAYS</b>

**4. Conclusion:**

The death of a woman during the gravid-puerperal period is a distressing event, feared by society. In recent years, the maternal and child health issue is one of the main national priorities in Côte d'Ivoire; important steps have also been taken to reduce maternal mortality. The purpose of our work is to appreciate the extent of this public health problem in the health region of Agnéby-Tiassa-Mé through routine surveillance on the national reporting platform (magpi) during In addition, this retrospective cross-sectional study has allowed us to have a general overview of the characteristics, the circumstances of the death and to identify the main causes of maternal mortality. This will allow us to have the necessary information to put actions in place to address them while taking into account the specific constraints of the region. These corrective actions are mainly divided into strengthening the number of specialized human resources (doctors and gynecologists); the technical platform, the skills of the actors in the field and the development of the community component. In addition, the notification system should be improved at the regional level both qualitatively (correct and exhaustive information of the items of the

notice) and quantitatively (notification of cases of death in the community). In addition, reviews of all death cases should be systematic in the region in accordance with national guidelines so that they can better understand all the determinants of maternal deaths. Efforts still need to be made to improve the situation and achieve the goal of safer motherhood.

### 5. Acknowledgments:

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- Directors of health structures for data management at their area of responsibility and their transmission at district and regional level
- Heads of Epidemiological Surveillance Centers in the health districts for their role in reporting and data management.

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