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Maternal health epidemiology in Rwanda

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Abstract

Maternal Health is the health of women during pregnancy, childbirth and the postpartum period. The study objective was to assess maternal health epidemiology in Rwanda for 2014 and in the beginning of 2015. All 47 hospitals in Rwanda were visited by the researcher. The researcher worked with maternity services, data management services and community health services to reach the required documents. The used documents were verbal autopsies filled after each death of a mother due to the complication of pregnancy, delivery and in postpartum period within 42 days. An extensive desk review of hospital level documents and reports was conducted for the period of 4 quarters of 2014 (the whole year 2014) and 1 quarter of 2015(January-March 2015) in order to capture the required data. Data were analyzed using computer software Ms Excel. The study reveal that 306 mothers were died at health facilities and 32 women died in community during the year 2014. Among those deaths around the half (44.9%) happened in referral hospitals. Also the prevalence is high in urban hospital than l in rural hospital. The most frequented associated factor in maternal death was the delay in seeking health care followed by intoxication. The period of complication is high in post-partum with the prevalence of 53% followed by 30% in pregnancy and 16% in delivery. The main cause of maternal death in 2014 was post-partum hemorrhage (PPH) with 26% followed by other unspecified caused which takes 22% and 40% of maternal death happened in less than 24 hours in post-partum, 24% in period of post-partum between 7-42days, 13% occurred between 1-7 days in post-partum and 23% occurred in period not ranged in post-partum period. At the time of death, 69% of mothers died had a post-partum status of pregnancy against 12% of ante-partum, 10% of post-abortion and 9% of intra-partum. However, the results of the study showed that although much has been achieved in reducing maternal mortality and Rwanda is on track for MDGs targets, Rwanda needs to do much more so that no woman can die from maternal complications. Rwanda is still facing a heavy burden of maternal mortality. It is in this regard that the researcher proposed different recommendations at different levels.

Keywords: Maternal Health.

Introduction

According to WHO, Maternal Health is the health of women during pregnancy, childbirth and the postpartum period. While motherhood is often a positive and fulfilling experience, for too many women it is associated with suffering, ill-health and even death. It encompasses the healthcare dimensions of family planning, preconception, prenatal, and postnatal care in order to reduce maternal morbidity and mortality.

The majority direct causes of maternal morbidity and mortality include hemorrhage, infection, high blood pressure, unsafe abortion, and obstructed labor. The maternal mortality rate (MMR) is the annual number of female deaths per 100.000 live birth from any causes related to or aggravated by pregnancy or its management (excluding accidental or incidental causes).

The MMR includes deaths during pregnancy, childbirth, or within 42 days of termination of pregnancy, irrespective of the duration and of the pregnancy, for a specific year.

Rwanda's maternal mortality ratio decreased by 77% between 2000 and 2013 and currently stands at 320 deaths per 100.000 live births[1]. Under-5 child mortality has been reduced by more than 70% and is well on the way to meet the goal of 54 deaths per 1.000 live births[2].

Decline in maternal mortality are linked to skilled birth attendance and improvements in contraceptive coverage rate. Rwanda supported and strengthened its workforce to address maternal and child mortality. By 2012, there was one doctor per 16.000 people and one nurse per 1.300 people. Before 1997, Rwanda had no trained midwives, but now there are around 1.000[2]. Rwanda established new standards for quality of care, and in 2010, delivery by a skilled provider was at 69%, as was delivery in health facility.

With improved facilities, the maternal mortality rate in Rwanda drop from 750[3] to 540 in year 2008 and to 383 according to the Health Management Information System[4]. Delivery attended by skilled Health Worker increased from 38% in 2005[3] to 52 in 2007[5], 63.5% in 2010[4].

Rwanda proposed the following target for reducing maternal mortality: 1071 in 2000, 750 in 2005, 540 in 2008, 383 in 2010 and 268 in 2015[6]. Rwanda still bears a heavy burden on high maternal mortality (476/100.000 live births), neonatal mortality (27/1000 live births) under-5 mortality (76/1000 live births) and infant mortality (50/1000 live births)[4].

Rwanda still faces challenges. The country needs 586 more midwives to reach 95% skilled birth attendance. Rural areas still underserved: 40% of women live more than an hour away from a health facility. And nearly one in every two children under-5 is stunted.

In 1995, most development agencies were ready to give up on Rwanda, then one of the poorest and most vulnerable countries in the World. But now, Rwanda is one of the few countries on track in 2015 to meet the Millennium Development Goals for reducing child and maternal mortality[7].

Methodology

The study design adopted an objective philosophy and used a survey strategy. It has exploited subjective and interpretive character. The study has been mainly exploratory and involved quantitative methods. The study examined data of 5 quarters (4 quarters of 2014 and 1quarter of 2015). The study was cross-sectional and was conducted in 2015.

The study involved quarterly reports because after each quarter, verbal autopsies of each maternal death occurred in both health facilities or in community are collected to the hospital level so that they can be sent to the central level. All 47 hospitals in Rwanda were visited by the researcher. The researcher worked with maternity services, data management services and community health services to reach the required documents. The used documents were verbal autopsies filled after each death of a mother due to the complication of pregnancy, delivery and in postpartum period within 42 days.

When a mother die from the complication of pregnancy, delivery and in postpartum period within 42 days in community, a Community Health Workers in village has a form to be automatically filled and send a rapid SMS on telephone to the central level then call the community health officer at health center level to come and fill another of the health center.

The form filled by the health center is filled by a group of 3 persons together (community health officer, in charge of maternity and a data manager). All forms filled at village level by community health workers and that of the team from the health center if the death occurred in community are combined with others filled by each health facility if the death occurred at health facility then all of them are collected at hospital level in services of data managements for death occurred at health facility and in community health office for death occurred in community.

An extensive desk review of hospital level documents and reports was conducted for the period of 4 quarters of 2014 (the whole year 2014) and 1 quarter of 2015 (January-March 2015) in order to capture the required data. Data were analyzed using computer software Ms Excel. The study objective is to evaluate maternal health epidemiology in Rwanda for 2014 and in the beginning of 2015.

Results and discussion

The figure indicate that 306 mothers were died at health facilities and 32 women died in community during the year 2014. Among that death around the half (44.9%) happened in referral hospitals King Faisal, CHUK and CHUB. Also the prevalence is high in urban hospital than in rural hospitals.

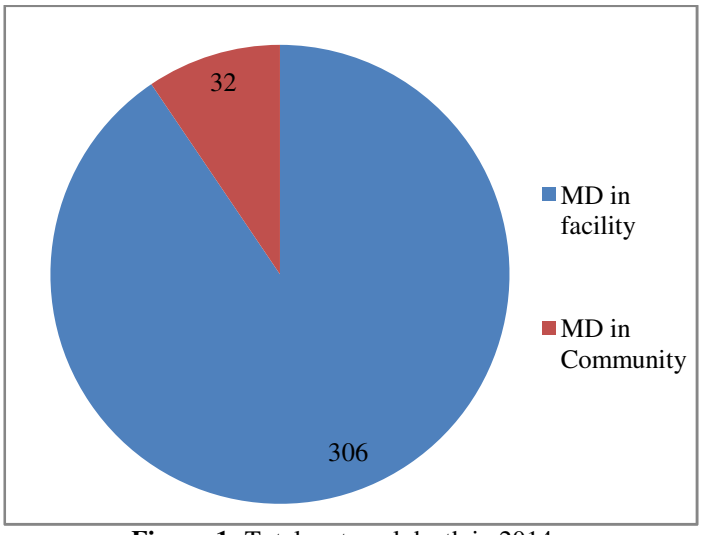


Figure-1: Total maternal death in 2014.

The Figure-1 show that 32 women died in community and 306 mother death occurred in health facilities.

Table-1: Associated factors in maternal death in community (2014),

Factors	Number of Death	%
Delay in seeking care	19	59.4
Intoxication	6	18.8
Not attended ANC as indicated	3	9.4
All necessary have been done	4	12.5
Total	32	100.0

The Table-1 shows that the most frequented associated factor in maternal death was the delay in seeking health care followed by intoxication.

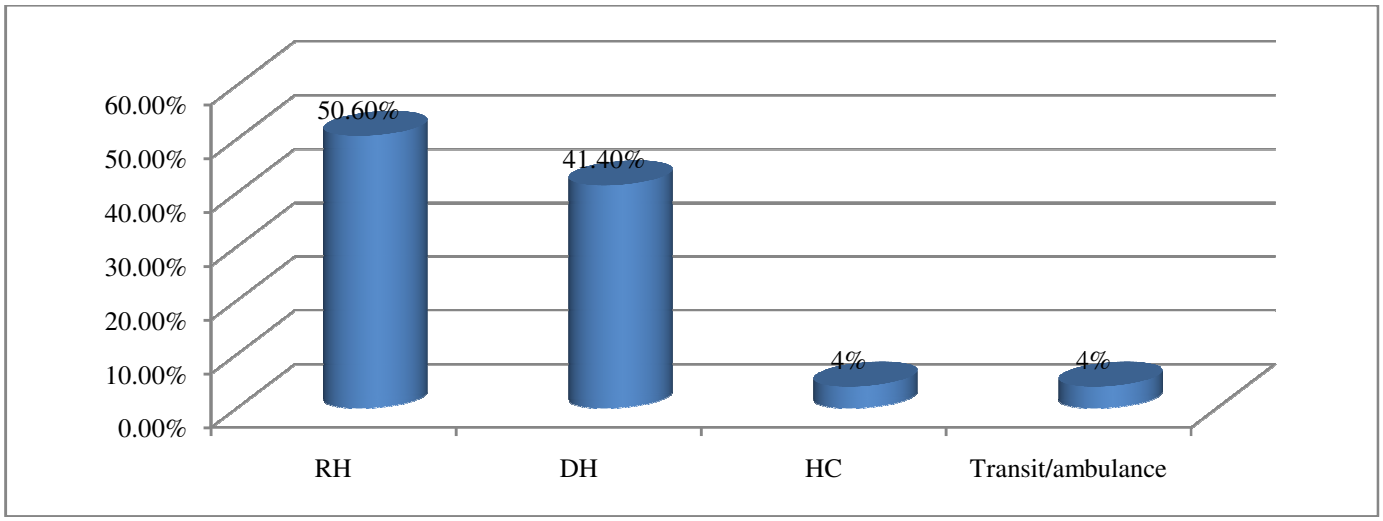
Table-2: Maternal death(MD) in Health Facilities in 2014.

Maternal Death	In Health Facilities		In Community	
Hospital	Number	%	Number	%
CHUK	81	26.5	0	0
CHUB	47	15.4	0	0
King Faisal Hospital	3	1.0	0	0
Nyanza	11	3.6	2	6.3
Rwamagana	8	2.6	0	0.0
Gisenyi	9	2.9	2	6.3
Rwinkwavu	6	2.0	1	3.1
Mibilizi	11	3.6	0	0.0
Muhororo	5	1.6	0	0.0
Munini	2	0.7	1	3.1
Kibuye	1	0.3	0	0.0
Kibagabaga	5	1.6	1	3.1
Ruhengeri	1	0.3	1	3.1
Kabaya	6	2.0	0	0.0
Nemba	2	0.7	0	0.0
Murunda	10	3.3	0	0.0
Bushenge	6	2.0	0	0.0
Byumba	8	2.6	2	6.3
Ngarama	2	0.7	0	0.0
Kiziguro	1	0.3	0	0.0
Ruli	4	1.3	0	0.0
Kibungo	7	2.3	1	3.1
Gakoma	5	1.6	3	9.4
RemeraRukomo	2	0.7	4	12.5
Kibilizi	2	0.7	0	0.0
Mugonero	1	0.3	0	0.0

Maternal Death	In Health Facilities		In Community	
Hospital	Number	%	Number	%
Kabutare	8	2.6	1	3.1
Rutongo	2	0.7	1	3.1
Ruhango	1	0.3	1	3.1
Shyira	3	1.0	0	0.0
Kabgayi	2	0.7	0	0.0
Kirinda	5	1.6	2	6.3
Kirehe	1	0.3	0	0.0
Gahini	5	1.6	1	3.1
Kinihira	3	1.0	2	6.3
Nyamata	6	2.0	1	3.1
Nyagatare	6	2.0	0	0.0
Kibogora	2	0.7	2	6.3
Kigeme	1	0.3	0	0.0
Muhima	5	1.6	1	3.1
Masaka	4	1.3	0	0.0
Gitwe	4	1.3	1	3.1
Butaro	1	0.3	0	0.0
Gihundwe	1	0.3	0	0.0
Kaduha	0	0.0	1	3.1
Kacyiru	0	0.0	0	0.0
Kanombe	0	0.0	0	0.0
Total	306	100	32	100

The data here indicates that 44.9% of maternal death occurred in District Hospital (DH), 36.1% in Referral Hospital (RH), 7% in Health Center (HC) and 12% in community.

The period of complication is high in post-partum with the prevalence of 53% followed by 30% in pregnancy and 16% in delivery.



RH: Referral Hospital, DH: District Hospital, HC: Health Center
Figure-2: Place of maternal death (MD) 2014.

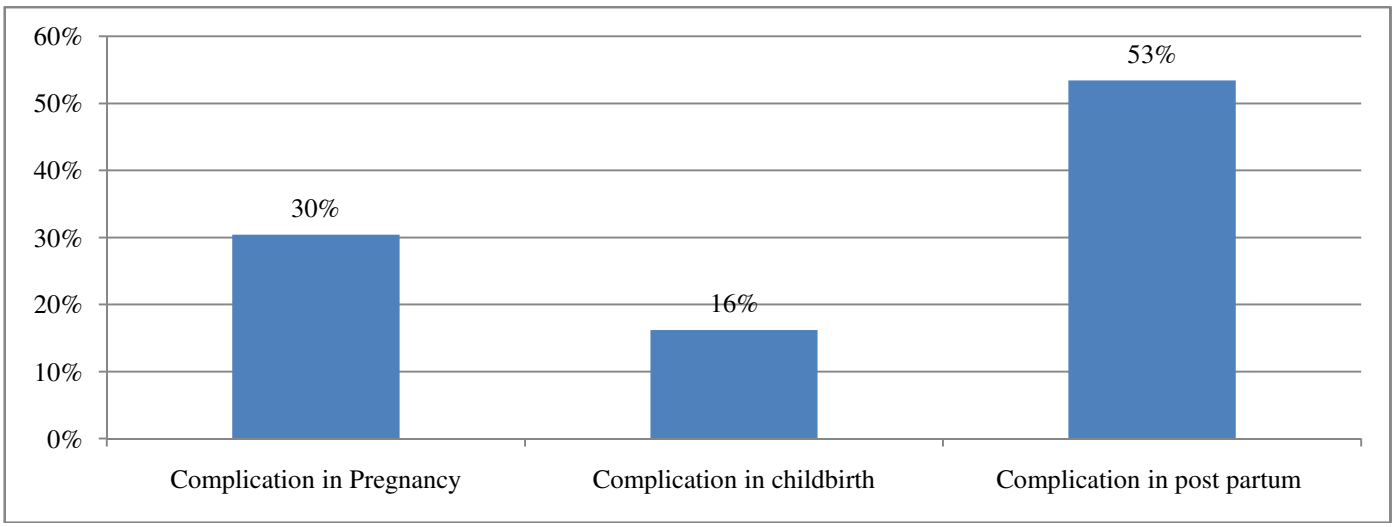


Figure-3: Period of complication 2014.

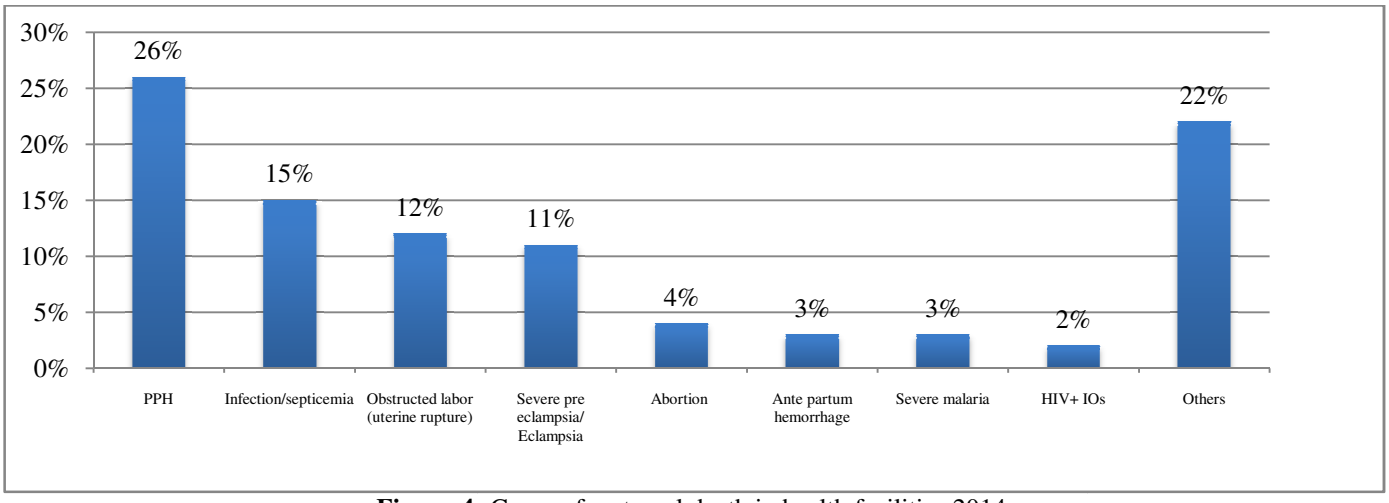


Figure-4: Cause of maternal death in health facilities 2014.

The Figure-4 shows that the main cause of maternal death in 2014 was post-partum hemorrhage (PPH) with 26% followed by other unspecified caused which takes 22%. The other high contributing factors include infection/septicemia with 15%, obstructed labor/uterine rupture with 12% and severe pre-eclampsia/eclampsia with 11%.

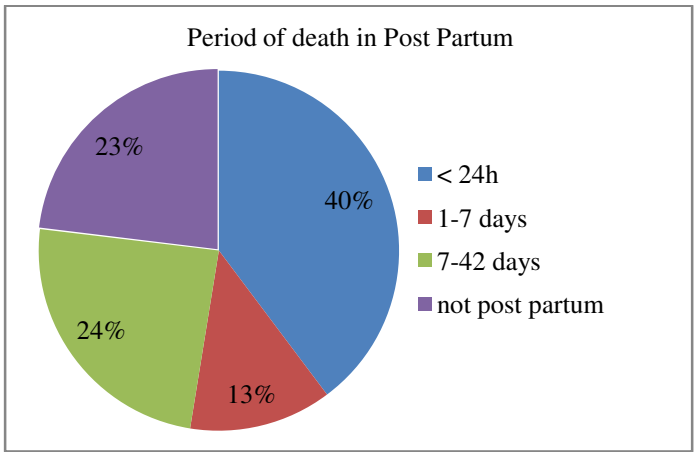


Figure-5: Period of maternal death in Post-Partum.

The Figure-5 indicates that 40% of maternal death happened in less than 24 hours in post-partum, 24% in period of post-partum between 7-42 days, 13% occurred between 1-7 days in post-partum and 23% occurred in period not ranged in post-partum period.

Table-1: Maternal death in Health Facilities January – March 2015.

Maternal Death	In Health Facilities	
Hospital	Number	%
CHUK	26	32.9
CHUB	12	15.2
King FaisalHospital	2	2.5
Nyanza	3	3.8
Rwamagana	1	1.3
Gisenyi	2	2.5
Rwinkwavu	1	1.3
Mibilizi	3	3.8
Muhororo	0	0.0
Munini	0	0.0
Kibuye	2	2.5
Kibagabaga	2	2.5
Ruhengeri	2	2.5
Kabaya	0	0.0
Nemba	0	0.0
Murunda	1	1.3
Bushenge	1	1.3
Byumba	1	1.3
Ngarama	0	0.0
Kiziguro	4	5.1
Ruli	1	1.3
Kibungo	2	2.5
Gakoma	1	1.3
RemeraRukomo	0	0.0
Kibilizi	0	0.0
Mugonero	0	0.0
Kabutare	0	0.0
Rutongo	0	0.0
Ruhango	1	1.3
Shyira	0	0.0
Kabgayi	1	1.3
Kirinda	0	0.0
Kirehe	0	0.0
Gahini	1	1.3
Kinihira	1	1.3
Nyamata	2	2.5
Nyagatare	1	1.3
Kibogora	0	0.0
Kigeme	0	0.0
Muhima	1	1.3
Masaka	0	0.0
Gitwe	3	3.8
Butaro	1	1.3
Gihundwe	0	0.0
Kaduha	0	0.0
Kacyiru	0	0.0
Kanombe	0	0.0
Total	79	100.0

Like in 2014, also in 2015 more than a half 50.6% of maternal death occurred in referral hospital CHUK, CHUK and King Faisal Hospital.

From the Figure-6, 69% of mother died had a post-partum status of pregnancy against 12% of ante-partum, 10% of post-abortion and 9% of intra-partum.

There are almost no changes between the year 2014 and 2015 except that death in community were avoided. More than half (50.6%) of maternal death occurred in referral hospitals, 41% in district hospitals and 4% in health centers and in ambulance.

Contrary to the year 2014, the main cause of maternal death was sepsis/peritonitis with 21 cases, post -partum hemorrhage with 12 cases and obstructed labor/uterine rupture with 11 cases.

The Figure-9 shows that almost death cases of sepsis/peritonitis (18 cases) happened in referral hospital CHUK.

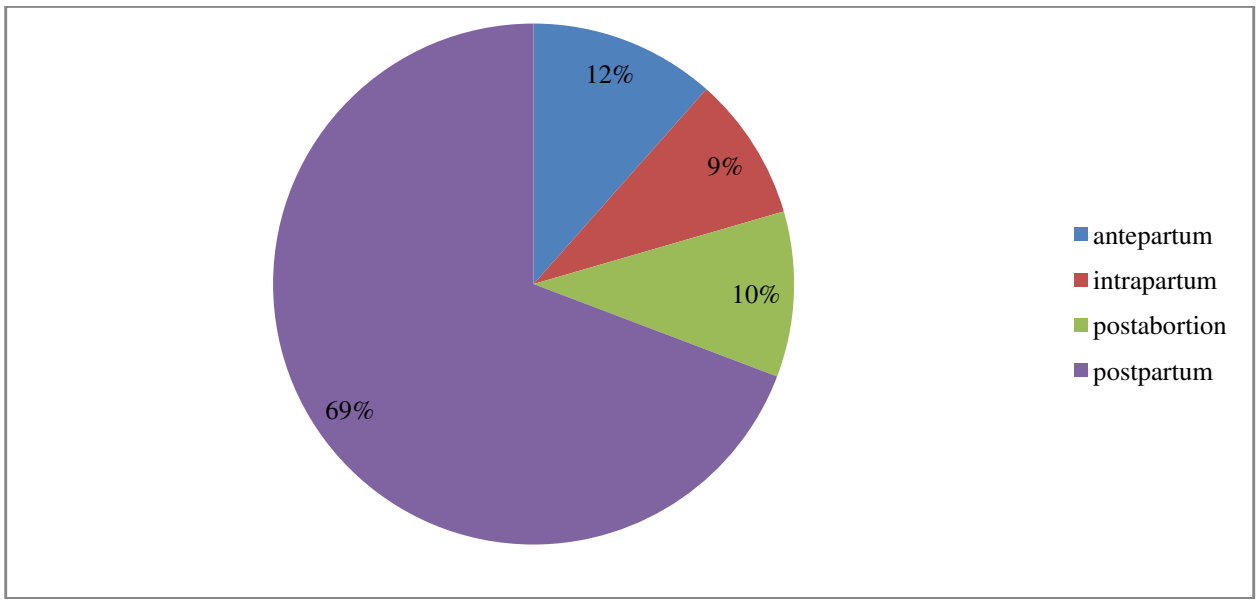
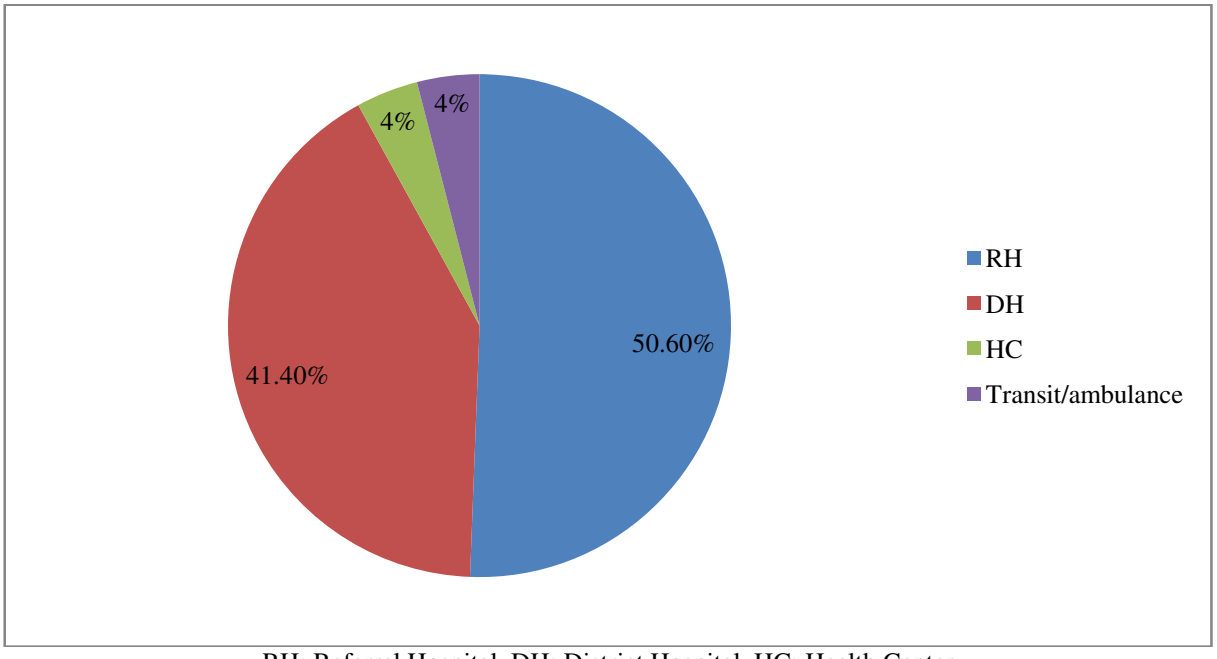


Figure-6: Status of pregnancy at the time of death.



RH: Referral Hospital, DH: District Hospital, HC: Health Center

Figure-7: Place of maternal death (January-March 2015).

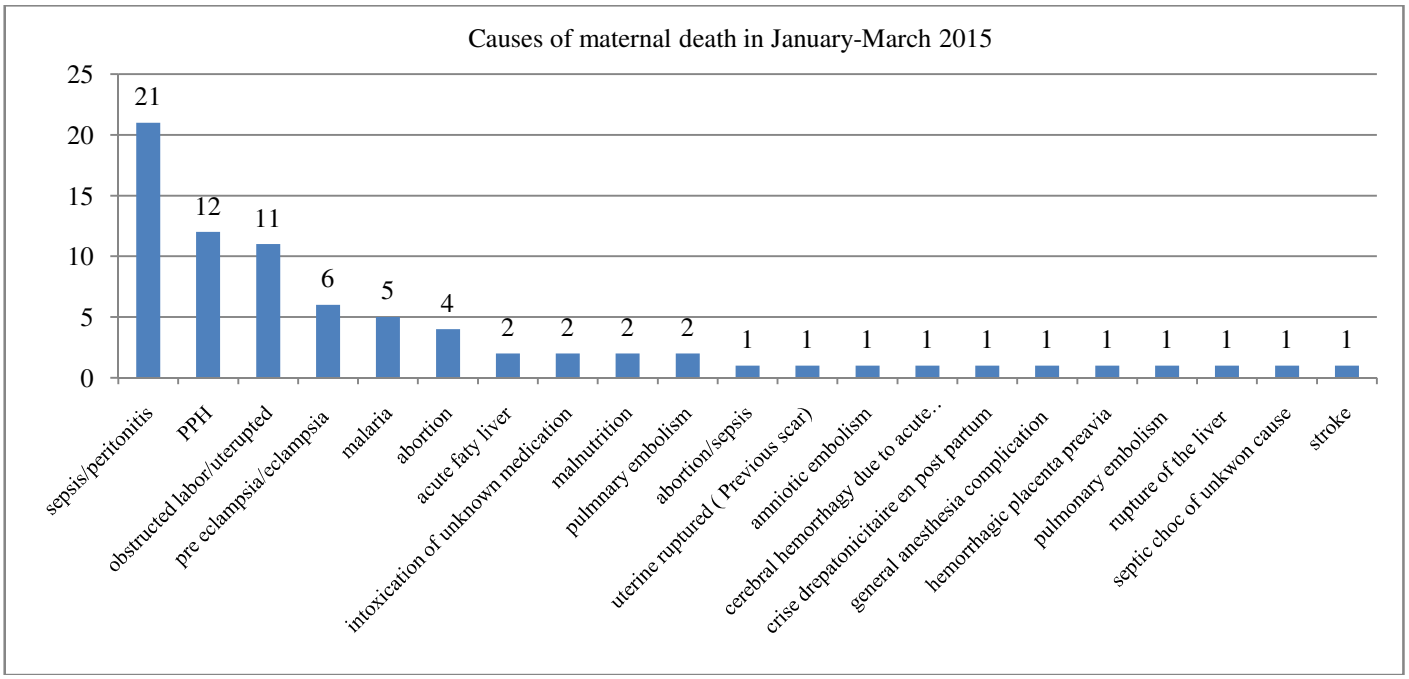


Figure-8: Causes of maternal death in January-March 2015.

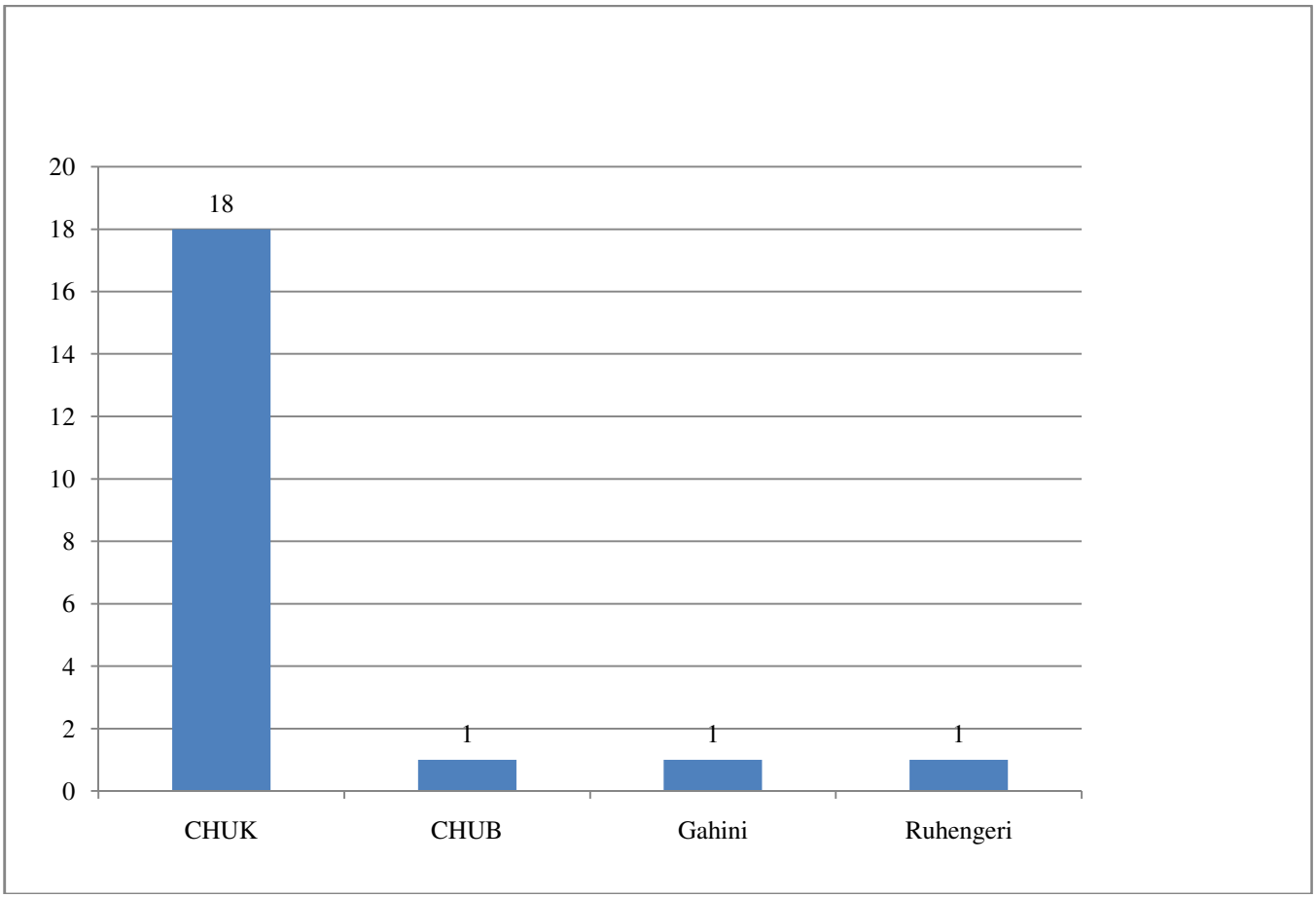


Figure-9: Sepsis cases and distribution according to facility (January-March 2015).

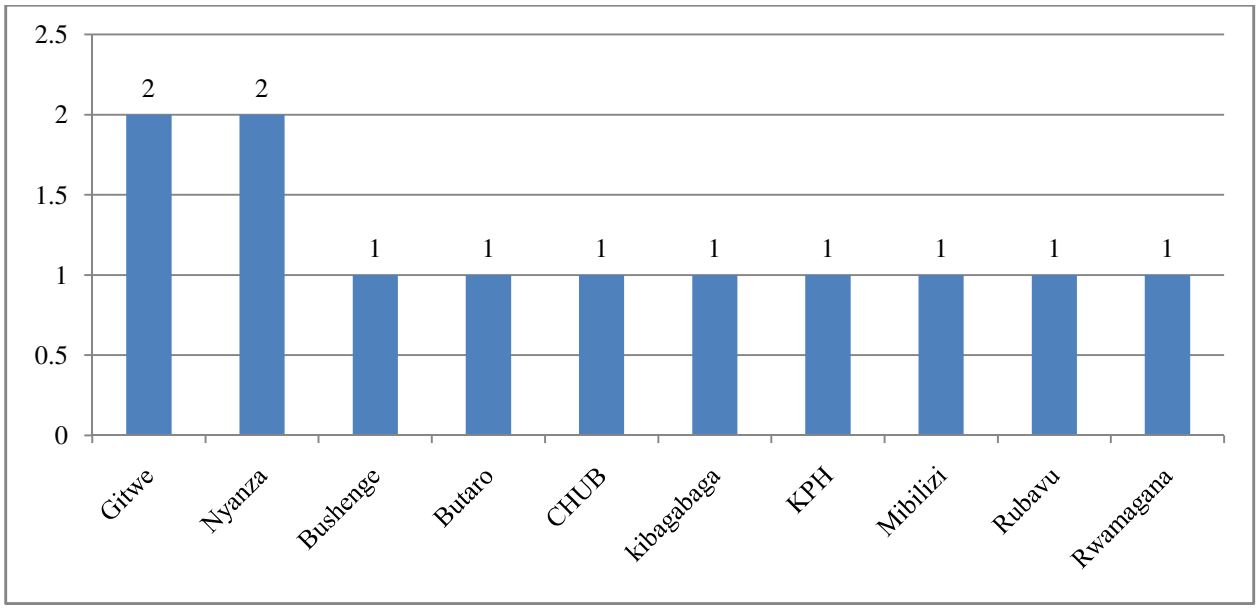


Figure-10: Distribution of post-partum hemorrhage according to health facility (January-March 2015).

The Figure-10 shows that most maternal deaths due to post-partum hemorrhage were occurred in district hospital (10 cases out of 12 cases).

Results discussion: With improved facilities in maternal health care, Rwanda is at good position regarding the reduction of maternal mortality. During the year 2014, the total maternal mortality in the whole country was 306 mothers. Considering with the target of the government of Rwanda which was 383 in 2010 and 268 in 2015, Rwanda is on track with its target and the target of Millennium Development Goals (MDGs). With the number 338 of maternal mortality in 2014 and basing on data of the first quarter 2015 which is 79 cases of maternal deaths, there is a high chance and credibility to achieve more even beyond the target.

The data shows that 12% of maternal death happened in community and 7% occurred in health center in 2014. Those data represent a public health hazard/danger from death in community and death in health facility where maternal health care facilities are not more improved like at the district hospital. Although 19% (12% & 7%) maternal mortality occurred not at the hospital where found improved maternal health care facilities, ambulance were provided for each group of 3 health center in the same area. The ambulance is placed at health center placed in midway of those 3 health centers sharing the same ambulance. But as problem those ambulances are not enough because it is broken down, it requires the health center to another from far away.

The study showed that the more frequented maternal complications in 2014 occurred in post-partum period (53%) followed by complication in pregnancy (30%). Most of maternal mortality was caused by post-partum hemorrhage (26%) and others unspecified causes (22%) in 2014. Contrary in 2015, the most frequented causes of maternal death were sepsis/peritonitis with 21 cases and 12 cases of post-partum hemorrhage (from January-March 2015). The study indicated that 40% of maternal death happened in less than 24 hours in post-partum, 24% in period of post-partum between 7-42days, 13% occurred between 1-7 days in post-partum and 23% occurred in period not ranged in post-partum period for year 2014. At the time of death for year 2015, 69% of mothers had pregnancy in post-partum.

Conclusion

After analyzing data for maternal health in Rwanda for the studied period, the researcher observed that the following contributive factors in maternal death can be preventable and if corrected can reduce maternal death. Those include: i. Delay to consult a health facility, ii. Delay to take decision (Health providers), iii. Delay to referrer some critical cases, iv. Delay of ambulance to reach some health facility (geographic accessibility), v. Insufficient follow up of women in labor (use of partograms), vi. No follow up of protocol in post-partum, post-operative surveillance, vii. Poor quality performing of health facilities, viii. Insufficient number of nurses in maternity.

Recommendations: The results of the study showed that although much has been achieved in reducing maternal mortality and Rwanda is on track for MDGs targets, Rwanda needs to do much more so that no woman can die from maternal complications. Rwanda is still facing a heavy burden of maternal mortality. It is in this regard that the researcher proposed different recommendations at different levels.

Central level: i. To enhance the mentorship with Health Facilities on maternal health, ii. To avail (increase) the

ambulance to Health Facilities to decrease the delay, iii. Provide regular feedback on maternal health to Health Facilities, iv. To increase nurses in maternity.

District Hospitals: i. To notify cases within 24h as indicated, ii. Respect time for reporting within 1 week, iii. To learn from previous experiences in maternal health, make decision for correcting bad experiences and make sure the recommendations of last review have been taken in consideration to avoid the same situation in the future, iv. Health providers to take decision on time, v. Sufficient follow up of women in labor (use of partograms), vi. Follow up of protocol in post-partum, post-operative surveillance.

Health Center: i. To notify in 24h and 48h if death occurs in Community, ii. Respect time for reporting within 1 week and 1 month, iii. To learn from previous experiences in maternal health, make decision for correcting bad experiences and make sure the recommendations of last review have been taken in consideration to avoid the same situation in the future, iv. Health providers to take decision on time, v. Sufficient follow up of women in labor (use of partograms), vi. Follow up of protocol in post-partum, post-operative surveillance.

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