



Title: Prevalence of preterm birth and associated risk factors at Kirehe District Hospital, Rwanda

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Abstract

Preterm birth occurs when delivery happens at less than 37 completed weeks of gestation as defined by WHO. In Rwanda, 35,000 babies are born prematurely each year and 2,600 children die due to the complications of preterm births. Cross sectional study design helped researcher to determine factors that are associated with preterm birth among mothers delivered at Kirehe District Hospital. Systematic sampling technique was used to select sample of 422 respondents from 3092 mothers delivered at Kirehe District Hospital within the period of six months. Data was collected by using structured questionnaire which was conceptualized according to the research objectives to answers each of research questions. To analyze data of this study, SPSS V.21 was used and eventually, enable to calculate measures of central tendency. All data from different components of the questionnaire was entered to an SPSS computer program by researcher and further cleaned. A bivariate and multivariate logistic regression was used to measure the association between dependent and independent variables. Variables with a p-value of less than 0.05 in the bivariate analysis was then entered into a multivariable logistic regression to control effect of confounders. The statistical significance was confirmed at the p-value < 0.05 with 95% of Confidence interval. The study findings showed that the majority 72.7% of respondents were aged between 21 to 35 years. The findings of this study revealed that 15.20% respondents had premature delivery. The study showed that there were statistically significant association between education level, religion, alcohol use, times of ANC attendance, onset of

labor, pregnancy outcome to preterm birth. Women who attended ANC three times were less likely to have a premature birth [AOR: 0.314; 95%CI: 0.172-0.581; P-value: <0.001] compared to women who attended ANC two times and below. Ministry of Health is recommended to enhance 8 standards visits of ANC through different health facilities and all services packages during ANC. Researchers are recommended to make further studies to see how preterm birth can be minimized and how risk factors revealed in the current study can be addressed and interventions to be put in place.

Keywords: Preterm birth, Kirehe District Hospital.

Introduction

Preterm birth is a major cause of death and a significant cause of short and long-term disability among survivors all around the world. Complications of preterm birth are the largest direct cause of neonatal deaths, responsible for 35% of the 3.1 million deaths every year worldwide, and the second most common cause of under five deaths after pneumonia. Preterm birth is the leading direct cause of neonatal death (27%); more than one million preterm new-borns die every year. It is also the major risk factors for neonatal mortality, particularly for deaths due to infections. The strong commitment is required to reduce mortality in new-born and to achieve a decline in neonatal deaths [1].

The most recent estimates were published in 2012 (covering data for the period 1990–2010) by Blencowe and colleagues. They estimated that 14,9 million babies (uncertainty range 12,3-18,1 million) were born preterm in 2010, accounting for 11.1 % of all live births worldwide. In the 65 countries with reliable time trend data for preterm birth, 62 countries had increasing rates from 1990 to 2010. However, these preterm birth estimates now require updating, in light of new data and continued refinements in statistical modelling methods.

The official WHO estimates of preterm birth are an essential global resource for assessing the burden of preterm birth and developing public health programs and policies. The methods that will be used to identify, critically appraise and analyze all eligible preterm birth data have been described by the protocol of WHO, in order to develop global, regional and national level estimates of levels and trends in preterm birth rates for the period 1990 – 2014[2].

The countries without neonatal intensive care, low number of babies below gestation age of 31 weeks survive and even ones born below 30 weeks may have called abortion whereas in countries with intensive care, even babies born at 22 weeks survive. Preterm babies showed to have increased risk of morbidity due to different mechanisms and some of them are related directly to babies' immaturity. Such babies may also be a marker for different problems which could lead to other diseases such as, systemic inflammation and fetal infections and those

diseases are themselves associated with damage of cerebral white matter, intracranial hemorrhage as well as lung chronic diseases [3].

An estimated 44.000 new born die each year in Uganda and more than a third of infant mortality is contributed by new born mortality where the most new-born deaths occur during the first week of life. Poor utilization of health services, including failure to attend Antenatal Care (ANC) and delays in seeking care at health facilities during labor were listed by health care providers as major factors contributing to both maternal and newborn deaths. This was thought to be due to the long distances that mothers have to travel to health facilities and poor referral and transport systems. In addition, the quality of health services offered in facilities was mentioned as a barrier to quality care, specifically in regard to inadequate drugs and equipment, delays by health staff to attend to mothers, and lack of skilled staff, especially at lower health facilities [4].

In the study done in Rwanda, to identify the causes of neonatal death in Rwanda, 34% of deaths were associated with prematurity, 29% due to sepsis, 18% due to congenital abnormalities, 7% due to birth asphyxia, 6% due to pneumonia, 1% due to diarrhoea and 5% due to others causes [5]. The management of LBW is complicated in any country, but it becomes even more challenging in developing countries such as Rwanda. Multifactorial elements play a considerable part and complicate LBW newborn care, such as chronic family poverty leading to food insecurity, limited qualified and skilled healthcare providers (HCPs), insufficient equipment at health facilities, and lack of pregnant women's prosperity leading to future hopelessness. Fortunately, Rwanda has the political will to strengthen MCH through different initiatives and strategies [6].

Methods

Study design

This study used cross-sectional study design which is suitable for prevalence studies. This study design helped researcher to collect quantitative data to enable answer on the total number of mothers delivered at Kirehe District Hospital with preterm deliveries and helping researcher to determine the prevalence of preterm birth at Kirehe District Hospital.

Target Population

Kirehe District Hospital uses to receive mothers transferred from 19 health centers coming to seek delivery services. A total number of 3092 mothers delivered at Kirehe District Hospital

within a period of six months (January 2022 to June 2022) are target population and representative sample was calculated from them.

Sample size and sampling procedure

The representative sample of 422 was chosen using the reasoned choice as the technique of sampling. Structured questionnaires were printed and given to data collectors who were the midwives and nurses working at Kirehe Hospital and they assisted in interviewing mothers. Information from respondents were recorded on these structured questionnaires with closed questions after getting their verbal consent.

Reliability and validity of questionnaire

Validity refers to the extent to which a measurement is well founded accuracy collected data or measures while reliability lays to the degree of measurement consistency depending on validated measures. The pilot study was conducted on 10% of sample size (42 mothers) which was randomly sampled from Kirehe District Hospital to test reliability but this pilot people was excluded during the right data collection. To ensure the reliability of research tool, researcher verified the completeness of questionnaire and consistency of respondent's answers and then, validity was depended on the reliability of this research tool when was reused in future study. The validity was depended on the reliability of this research tool when reused in future study.

Data analysis and ethical consideration

To analyze data of this study, SPSS V.21 was used and eventually, enabled to calculate measures of central tendency. All data from different components of the questionnaire were entered to an SPSS computer program by researcher and further cleaned. Analysis included, but not limited to, the following: Descriptive statistics, mainly frequency and percentage were applied to demographic, socio-economic and demographic profiles of participants and quantitative data was presented by using tables and graphs.

Regression analysis (logistic regression and multivariate analysis): to explore factors that may have significant influence on preterm birth at Kirehe District Hospital. Confidence interval of 95% and P-value of less than 5% was considered as level of statistical significance for risk factors of preterm birth.

The study was implemented in accordance with the research protocol approved by both the MKUR research ethical committee, Kirehe District and administrative committee of Kirehe Hospital and ethical permissions from them was also obtained. Researcher looked for

participant's consent to voluntarily participate in this study before data collection attempt, and did not ask and or indicate participants' names on study questionnaire. The researcher utilized the data for academic purpose only.

Results

Socio-demographic characteristics of respondents

The table below presents socio-demographic characteristics of 422 respondents all reached and data collected using questionnaire through face to face interview.

Table 1. Socio-demographic characteristics of respondents

Variables	Frequency	Percentage
Age group		
<20 Years	72	17.1
21 to 35 Years	307	72.7
36 Years and above	43	10.2
Education level		
No formal education	41	9.7
Primary	288	68.2
Secondary	87	20.6
Tertiary	6	1.4
Religion		
Christian	358	84.8
Muslim	1	0.2
Other	63	14.9
Place of residence		
Rural	359	85.1
Urban	63	14.9
Marital status		
Married	340	80.6
Unmarried	81	19.2
Divorced	1	0.2
Occupation		
Employee	12	2.8
Self employed	10	2.4
Farmer	386	91.5
Housewife	8	1.9
Unemployed	6	1.4
Health insurance		
Mutuelle de Sante	397	94.1
Private Insurance	22	5.2
No Insurance	3	0.7
Wealth Category (ubudehe)		

Category 1	60	14.2
Category 2	214	50.7
Category 3	148	35.1
Smoking		
Yes	0	0
No	422	100
Alcohol use		
Yes	25	5.9
No	397	94.1
Alcohol use during this pregnancy		
Yes	0	0
No	25	5.9

Table 1. of respondents' demographic characteristics interviewed shows that about age group 307(72.7%) of respondents were aged between 21 to 35 Years, 72 (17.1%) were less than 20 years and 43 (10.2) were 36years and above. On Education level, 288(68.2%) of respondents had primary level of education while 41 (9.7%) had no formal education but also 87 (20.6%) had secondary education and 6 (1.4%) had tertiary education. Religion analysis showed that 358(84.8%) respondents were Christians while others were 64 (15.2%)

According to the place of residence, only 63(14.9%) respondents lived in urban area, while 359 (85.1%) lived in rural area. The Marital status showed 340 (80.6%) who were married, 81 (19.2%) unmarried and 1 (0.2%) respondent was divorced. The occupation of 386(91.5%) respondents were farmers, 12 (2.8%) were employee, 10 (2.4%) were self-employed, 8 (1.9%) were housewife and unemployed respondents were 6 (1.4%). Considering Health insurance, we find that 397 (94.1%) respondents have been using Mutuelle de Santé as health insurance, 22 (5.2%) used private insurance and 3 (0.7%) had no insurance. In the Wealth (Ubudehe) category, 60 (14.2%) respondents were in first Category, 214(50.7%) respondents were in second category, while 148(35.1%) in third category. There was no respondent who was smoking, and about alcohol use, only 25 (5.9%) of respondent were using alcohol while 397 (95.1%) were not using alcohol. There was none using Alcohol during this pregnancy among 25 who use alcohol.

Antenatal characteristics of current pregnancy and delivery

The table below presents antenatal characteristics of current pregnancy and delivery and data collected by using questionnaire through face to face interview.

Table 2 Antenatal characteristics of current pregnancy and delivery

Variables	Frequency	Percentage
Attending ANC		
Yes	413	97.9
No	9	2.1
Times attended ANC		
Once	17	4
Twice	67	15.9
Three times	179	42.4
Four times	148	35.1
Five times	2	0.5
HIV Status		
Seronegative	418	99.1
Seropositive	4	0.9
Mode of delivery		
C-Section	257	60.9
Spontaneous Vaginal delivery	165	39.1
Onset of labor		
Spontaneous onset of labor	204	48.3
Induced labor	218	51.7
Pregnancy outcome		
Twin	5	1.2
Singleton	417	98.8
Pre-eclampsia		
Yes	10	2.4
No	412	97.6
Mother had premature rupture of Membrane		
Yes	39	9.2
No	383	90.8
History of UTI		
Yes	11	2.6
No	411	97.4
Ever had anemia during pregnancy		
Yes	5	1.2
No	417	98.8
Previous preterm birth		
Yes	6	1.4
No	416	98.6
Suffered from cardiovascular diseases		
Yes	0	0
No	422	100
Suffered from Diabetes		
Yes	0	0

No	422	100
Suffered from Asthma		
Yes	1	0.2
No	421	99.8

Source: Primary source

In this study information about antenatal characteristics of current pregnancy and delivery was asked. Almost all participants attended ANC with 413 (97.9%) except a few percentages 9 (2.10%) of them who did not attend ANC. Regarding the number of ANC attended by each woman, 17 (4%) of them attended one time, 67 (15.9%) attended twice, 179(42.40%) attended three times, 148 (35.1%) attended four times and only 2 (0.5%) attended five times. The majority of respondent 257(60.9%) had C-section as the mode of the delivery, while 165 (39.1%) had spontaneous vaginal delivery. The total of 204 (48.3%) respondents had spontaneous onset of labor while 218 (51.7%) had induced labor. The twin deliveries were 5 (1.2%) while 417 (98.8%) were Singleton deliveries. About pathologies on this pregnancy, 10 (2.4%) had preeclampsia and 412 (97.6) had no preeclampsia), 39 (9.2%) had PROM while 383 (90.8) had not experienced PROM. Mother had history of UTI: 11 (2.6%) had history of UTI but 411 (97.4) had no history of UTI. Considering history Anemia on pregnancy, only 5(1.2%) respondents have ever had anemia during pregnancy while 417 (98.8%) had not have anemia on pregnancy. Few respondents 6 (1.4%) had previous history of preterm birth while the majority 416 (98.6%) had not history of preterm birth and the respondent who suffered from asthma was only 1 (0.2%) while 421 (99.8%) had not suffered from asthma. There was no respondent found to have had suffered from cardiovascular disease or diabetes

Maternity Lifestyle

This study has been also looked on maternity lifestyle including length of hospital stay, strenuous work environment, prolonged standing, domestic house help, doing heavy lifting, doing extensive bending, daily meals consumed and BMI as it is presented in the table below.

Table 3 Maternity Lifestyle

Variables	Frequency	Percentage
Length of hospital stay		
Between 0 and 7 days	416	98.6
Above 7 days	6	1.4
Strenuous work environment		
Yes	35	8.3

No	387	91.7
Prolonged standing		
Yes	3	0.7
No	419	99.3
Domestic house help		
Yes	78	18.5
No	344	81.5
Doing heavy lifting		
Yes	2	0.5
No	420	99.5
Doing extensive bending		
Yes	1	0.2
No	421	99.8
Daily meals consumed		
One meal	9	2.1
Two meal	360	85.3
Three meal	53	12.6
BMI		
Under weight	18	4.3
Normal weight	303	71.8
Over weight	101	23.9

Source: Primary source

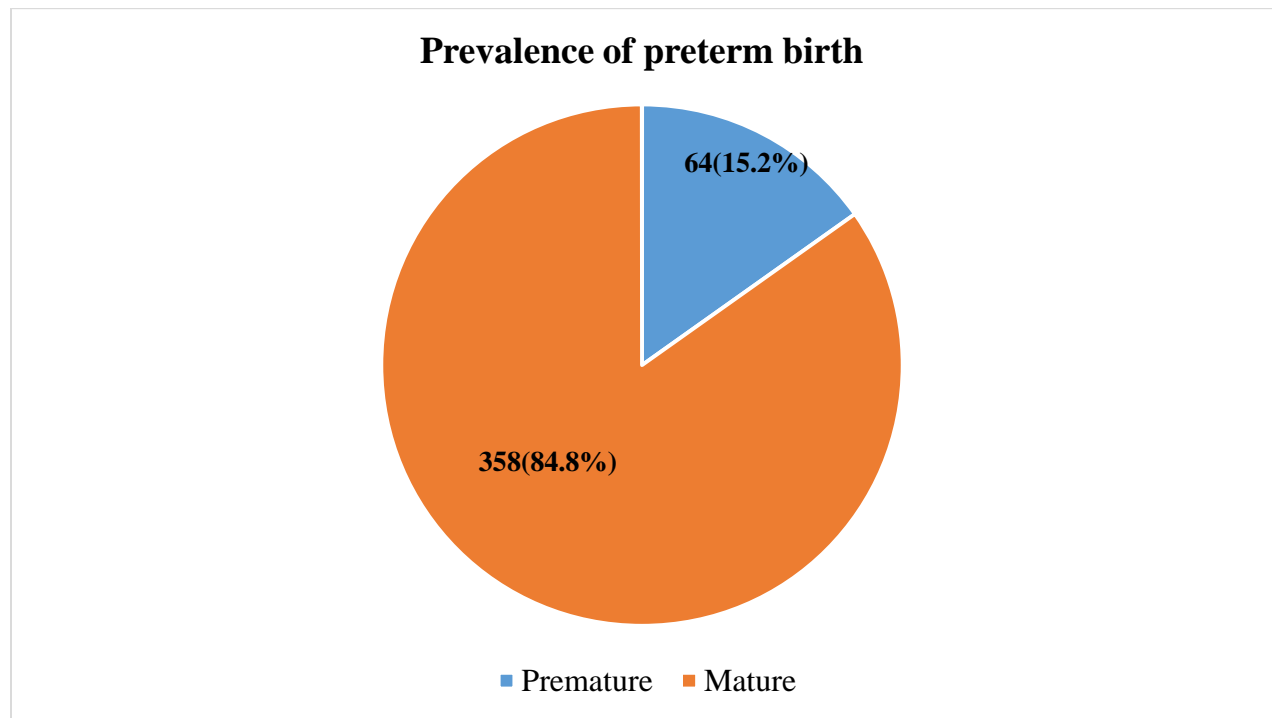
About the maternity lifestyle, the majority of respondents 416(98.6%) mentioned that they spent 0 to seven day to the Hospital while 6 (1.4%) spent above 7. 35(8.3%) of respondents mentioned that they use to do strenuous work environment while 387 (91.7%) denied and only 3(0.7%) respondents had prolonged standing while 419 (99.3%) had not had prolonged standing. 78(18.5%) of respondents did domestic house help while 344 (81.5%) did not, 2 (0.5%) of respondents did heavy lifting while 420 (99.5%) did not do heavy lifting and only 1 (o.2%) respondent did extensive bending while 421 (99.8%) did not do extensive bending. About feeding habit, the majority of respondents 360(85.3%) consumed two meals per day, 53(12.6%) respondents consumed three meals and only 9 (2.1%) consumed only one meal per day. The Body Mass Index (BMI) calculated showed that 18(4.3%) respondent found to be under weight, 101 (23.9%) had overweight while the majority of them 303 (71.80%) had normal weight.

Presentation of the findings

The findings of this study are presented according to their research objectives which are to determine prevalence of preterm birth among pregnant women who delivered at Kirehe District Hospital and to identify Risk factors associated with preterm births at Kirehe District Hospital.

Prevalence of preterm birth among pregnant women who delivered at Kirehe District.

The first objective of this study was to determine prevalence of preterm birth among pregnant women who delivered at Kirehe District and the variable of gestation age at birth range in weeks was used to find the prevalence.



Source: Primary source

Figure 1. The prevalence of preterm birth

The findings of this study revealed that 64 (15.20%) respondents had premature delivery while the majority of them 358(84.80%) had term delivery.

Risk factors associated with preterm births at Kirehe District Hospital.

The second objective of this study was to identify Risk factors associated with preterm births at Kirehe District Hospital. Socio demographic characteristics have been checked to see whether they are associated with preterm births.

Table 4 Socio-demographic characteristics of respondents (Bivariate analysis)

Variables	Preterm birth		P-Value
	Premature n(%)	Mature n(%)	
Age group			0.973
<20 Years	11(15.30)	61(84.70)	

21 to 35 Years	47(15.30)	260(84.7)	
36 Years and above	6(14.00)	37(86.00)	
Education Level			0.020
No Formal education	1(2.40)	40(97.60)	
Primary	52(18.10)	236(81.90)	
Secondary and above	11(11.80)	82(88.20)	
Religion			0.04
Christian	59(16.50)	299(83.50)	
Other religion	5(7.80)	59(92.20)	
Marital Status			0.08
Married	47(13.80)	293(86.20)	
Single Mother	17(20.70)	65(79.30)	
Occupation			0.553
Employed	2(9.10)	20(90.90)	
Unemployed	62(15.50)	338(84.50)	
Health Insurance			0.562
Mutuelle de sante	59(14.90)	338(85.10)	
Private insurance	5(20.00)	20(80.00)	
Place of residence			0.496
Rural	54(15.00)	305(85.00)	
Urban	10(15.90)	53(84.10)	
Wealth Category			0.758
Category 1	11(18.30)	49(81.70)	
Category 2	31(14.50)	183(85.50)	
Category 3	22(14.90)	126(85.10)	
Alcohol use			0.01
Yes	19(76.20)	6(23.80)	
No	64(16.10)	333(83.90)	
Did you attend ANC			0.224
Yes	64(15.50)	349(4.5)	
No	0(0.00)	9(100.00)	
Times of ANC attendance			<0.001
Two times and below	25(29.80)	59(70.20%)	
Three times and above	39(11.90)	290(88.10%)	
HIV Status			0.517
Seronegative	64(15.30)	354(84.70)	
Seropositive	0(0.00)	4(100.00)	
Mode of delivery			0.445
C-Section	38(14.80%)	219(85.20)	
Spontaneous Vaginal delivery	26(15.80)	139(84.20)	
Onset of labor			0.002
Spontaneous onset of labor	42(20.60)	162(79.40)	
Induced labor	22(10.10)	196(89.90)	
Pregnancy outcome			<0.001
Twin	4(80.00)	1(20.00)	
Singleton	60(14.40)	357(85.60)	

Source: Primary data

The research findings showed that there were statistically significant association between education level, religion, alcohol use, times of ANC attendance, onset of labor and pregnancy outcome and preterm birth with P-value <0.05 calculated at 95%CI.

Table 5 Socio-demographic characteristics of respondents (Multivariate analysis)

Variables	AOR	95% CI		P-Value
		Lower	Upper	
Education Level				
No Formal education	Ref			
Primary	0.133	0.017	1.037	0.054
Secondary and above	0.19	0.022	1.608	0.128
Religion				
Christian	Ref			
Other religion	1.614	0.591	4.403	0.35
Alcohol use				
Yes	Ref			
No	1.297	1.172	4.191	0.04
Times of ANC attendance				
Two times and below	Ref			
Three times and above	0.314	0.17	0.581	<0.001
Onset of labor				
Spontaneous labor	Ref			
Induced labor	1.79	1.292	3.23	0.03
Pregnancy outcome				
Twin	12.238	1.259	15.983	0.021
Singleton	Ref			

Source: Primary data

This study revealed that the mothers who did not drink alcohol during pregnancy, [AOR:1.297; 95%CI: 0.172-4.191; P-value: 0.04] they were less likely to have premature birth compared to those who used to drink alcohol during pregnancy. Women who attended ANC three times were less likely to have a premature birth [AOR: 0.314; 95%CI: 0.172-0.581; P-value: <0.001] compared to women who attended ANC two times and below. For onset of labor, women who had induced labor were more likely to have premature birth [AOR: 1.79; 95%CI: 1.292-3.23; P-value: 0.03] compared to women with spontaneous labor. Pregnancy outcome found to be a contributing factor of preterm birth, where women with twin pregnancy were more likely to have premature birth [AOR: 12.238; 95%CI: 1.259-15.983; P-value: 0.021] compared to the women with singleton pregnancy.

Table 6 Antenatal characteristics of current pregnancy and delivery (Bivariate analysis)

Variables	Preterm birth		P-Value
	Premature n(%)	Mature n(%)	
Mother had pre-eclampsia			0.020
Yes	4(40.00)	6(60.0)	
No	60(14.60)	352(85.4)	
Mother had premature rupture of Membrane			<0.001
Yes	25(64.10)	14(35.90)	
No	39(10.20)	344(89.8)	
Mother had history of UTI			<0.001
Yes	7(63.60)	4(36.40)	
No	57(13.90)	354(86.10)	
Mother has ever had anemia during pregnancy			0.020
Yes	3(60.00)	2(40.00)	
No	61(14.60)	356(85.40)	
Mother had previous preterm birth			0.040
Yes	3(50.00)	3(50.00)	
No	61(14.70)	355(85.30)	
Mother has suffered from Asthma			0.848
Yes	0(0.00)	1(100.00)	
No	64(15.20)	357(84.80)	
Length of hospital stay			0.006
Between 0 and 7 days	60(14.40)	356(85.60)	
Above 7 days	4(66.70)	2(33.30)	
Strenuous work environment			0.362
Yes	4(11.40)	31(88.60)	
No	60(15.50)	327(84.50)	
Prolonged standing			0.61
Yes	0(0.00)	3(100.00)	
No	64(15.30)	355(84.70)	
Domestic house help			0.210
Yes	9(11.50)	69(88.50)	
No	55(16.00)	289(84.00)	
Doing heavy lifting			0.719
Yes	0(0.00)	2(100.00)	
No	64(15.20)	356(84.80)	
Doing extensive bending			0.848
Yes	0(0.00)	1(100.00)	
No	64(15.20)	357(84.80)	
BMI			0.470
Under weight	1(5.60)	17(94.40)	

Normal weight	46(15.20)	257(84.80)	
Over weight	17(16.80)	84(83.20)	
Meal per day			0.272
Two Meals	58(15.70)	311(84.30)	
Three Meals	6(11.30)	47(88.70)	

Source: Primary data

The research findings showed that there were statistically significant association between having pre-eclampsia, having premature rupture of membrane mother, having history of UTI, having anemia during pregnancy, having previous preterm birth, length of hospital stay and preterm birth with P-value <0,05 calculated at 95%CI.

Table 7 Antenatal characteristics of current pregnancy and delivery (Multivariate analysis)

Variables	AOR	95% CI		P-Value
		Lower	Upper	
Mother had pre-eclampsia				
Yes	Ref			
No	3.801	1.547	6.215	0.091
Mother had premature rupture of Membrane				
Yes	Ref			
No	12.71	5.871	27.518	<0.001
Mother had history of UTI				
Yes	5.554	1.141	8.153	0.02
No	Ref			
Mother has ever had anemia during pregnancy				
Yes	1.693	1.085	6.912	0.007
No	Ref			
Mother had previous preterm birth				
Yes	Ref			
No	2.358	0.282	8.757	0.429
Length of hospital stay				
Between 0 and 7 days	Ref			
Above 7 days	0.126	0.062	1.91	0.420

Source: Primary data

This study revealed that the respondents who had premature rupture of membrane were more likely to have preterm birth [AOR: 12.71; 95%CI: 5.871-27.518; P-value: <0.001] compared to respondents did not have premature rupture of membrane. The mothers who had history of UTI were more likely to have preterm birth [AOR: 5.554; 95%CI: 1.141-8.153; P-value: 0.02] compared to those who did not have history of UTI. The mother had anemia during pregnancy

were more likely to have preterm birth [AOR: 1.693; 95%CI: 1.085-6.912; P-value: 0.007] compared to those who did not have anemia during pregnancy.

Discussion of the study findings

In Rwanda, 35,000 babies are born prematurely each year and 2,600 children under five die due to direct preterm complications. The number of risk factors relevant to preterm and low birth weight in Rwanda have been highlighted as well as the coverage of important care for women and newborns from pregnancy, labor and delivery and the postnatal period. There is also information that provides insights into the health workforce, health policies, health information and community mobilization relevant to preterm birth and low birth weight[5].

Although different studies have been carried out in Rwanda on preterm birth but in Kirehe District such study was in need and this study is helpful to show the current situation in Kirehe District.

The first objective of this study was to determine prevalence of preterm birth among pregnant women who delivered at Kirehe District and the variable of gestation age at birth range in weeks was used to find the prevalence. The findings of this study revealed that 15.20% respondents had premature delivery while the majority of them 84.80% had term delivery.

In sub-Saharan Africa is where the highest rate of preterm birth found and it counts a half of world's preterm birth. Even if the significant progress has been made to the care of infants within low and middle income countries, there is still an increase of preterm death [7].

The study conducted by Agnes and her colleagues was almost in the same line with the present study as the prevalence of preterm birth in Kirehe District, where it had found that the incidence of perinatal death regionally was higher and risk factors for perinatal mortality were null parity and maternal age >30 years. Pregnant women in this region need improved access to care during pregnancy and childbirth [8].

The second objective of this study revealed that socio demographic characteristics like educational level and religion were the factors associated with preterm birth occurrence in Kirehe District.

The study conducted in Dominica, was not in the same line with the present study, where it had the aim of identifying the relevant risk factors in the hope of reducing these fatal consequences. This study used a case control design and the family history of preterm birth was also assessed and found to be the most influencing risk factor of occurrence of preterm delivery in this study.

This study did not show any relationship between preterm birth and maternal sociodemographic factors, except maternal age of 35 years and adolescence and the sample size was not representative [9].

The study conducted in Nigeria has demonstrated that pre-term delivery remains a significant problem with a hospital based prevalence rate of 120 per 1,000 deliveries. This rate was higher than would be expected from a community based study because the study center is a tertiary center which attends to referrals from other primary and secondary centers [10].

The study conducted in Nigeria which has been mentioned was almost in the same line with the present study by looking on factors influencing the previous pre-term birth, these include history of previous pre-term birth, severe maternal hypertension, spontaneous pre-term rupture of fetal membranes, maternal age over fifty years, urinary tract infection, maternal anemia, maternal illness during pregnancy, previous abortion, null parity and low body mass index [10].

Rwanda has worked to reduce neonatal mortality through newborn survival initiatives, including a National Neonatal Care Protocol, and the establishment of neonatal care units in every public hospital to care for sick and small newborns. Recent data from Rwanda estimate that 6% of newborns are LBW (birth weight less than 2.5 kg) and 10% are preterm. Through the efforts to improve care for sick and small newborns, more preterm and/or LBW babies are surviving into childhood, but little is known about their long-term outcomes. Hence the present study came up with the prevalence of prematurity among pregnant women who delivered at Kirehe District Hospital [11].

As the present study showed the current situation of preterm birth in Kirehe District, the results could push the concerned organizations to conduct more research per each District of Rwanda to know specifically the contributing factors of preterm birth and measures to be taken in reducing its prevalence.

Conclusion

The main purpose of this study was to determine the prevalence of preterm birth and Associated Risk Factors at Kirehe District Hospital. The results of this study showed that there were social demographic characteristics factors and antenatal characteristics of current pregnancy and delivery factors that influencing the prevalence of preterm birth. In consideration of the study design, sample size and the characteristics of study population from Kirehe District so then, the results from this study can't be generalized for whole country.

Recommendation

MOH is recommended to enhance 8 standards visits of ANC through different health facilities and all services packages during ANC as recommended by WHO and as officially launched by the MOH in October 2022 and it is advised to increase community awareness to prevent and minimize alcohol intake during pregnancy. Kirehe District and Health Facilities in Kirehe District are recommended to reinforce follow up of all Pregnant women within the catchment areas and explains all risks factors associated with Preterm birth. Health Care Providers are recommended to implement all policies & procedures put in place by Ministry of Health and effectively use national guidelines of obstetrics and gynecology.

References

1. Costa, A., Moller, A. B., Blencowe, H., Johansson, E. W., Hussain-Alkhateeb, L., Ohuma, E. O., ... Moran, A. C. (2021). Study protocol for WHO and UNICEF estimates of global, regional, and national preterm birth rates for 2010 to 2019. *PLoS ONE*, *16*(10 October 2021), 1–13. <https://doi.org/10.1371/journal.pone.0258751>
2. Vogel, J. P., Chawanpaiboon, S., Watananirun, K., Lumbiganon, P., Petzold, M., Moller, A. B., ... Gülmezoglu, A. M. (2016). Global, regional and national levels and trends of preterm birth rates for 1990 to 2014: Protocol for development of World Health Organization estimates. *Reproductive Health*, *13*(1), 1–9. <https://doi.org/10.1186/s12978-016-0193-1>
3. Bell, R. J., & Dean, P. (2016). On localized vibrations due to non-bridging oxygen atoms in vitreous silica. *Solid State Communications*, *5*(9). [https://doi.org/10.1016/0038-1098\(67\)90386-9](https://doi.org/10.1016/0038-1098(67)90386-9)
4. Rwanda Ministry of Health. (2015). *Health Sector Policy*. 41. Retrieved from http://www.moh.gov.rw/fileadmin/templates/policies/Health_Sector_Policy___19th_January_2015.pdf
5. Ministry of Health, G. of U. (2016). *Situation analysis of newborn health in Uganda*. 1–72. MoH. (2016). *R w a n d a*. 10–12.
6. Murekatete, F., Muteteli, C., Mujawamariya, F., & Chironda, G. (2020). *Low Birth*

Weight Newborns and Associated Factors at Selected Referral Hospital in Rwanda. 3(2), 214–224.

7. Wagura, P., Wasunna, A., Laving, A., Wamalwa, D., & Ng, P. (2018). *Prevalence and factors associated with preterm birth at kenyatta national hospital.* 2–9.
8. Agnes, A., Arach, O., Tumwine, J. K., Nakasujja, N., Kiguli, J., Mukunya, D., ... Nankabirwa, V. (2021). Perinatal death in Northern Uganda : incidence and risk factors in a community-based prospective cohort study. *Global Health Action*, 14(1).
<https://doi.org/10.1080/16549716.2020.1859823>
9. Díaz-Rodríguez, A., Feliz-Matos, L., & Ruiz Matuk, C. B. (2021). Risk factors associated with preterm birth in the Dominican Republic: A case-control study. *BMJ Open*, 11(12), 1–7. <https://doi.org/10.1136/bmjopen-2020-045399>
10. Mokuolu, O. A., Suleiman, B. M., Adesiyun, O. O., & Adeniyi, A. (2019). *Prevalence and determinants of pre-term deliveries in the University of Ilorin Teaching Hospital , Ilorin , Nigeria.* 2, 11–14. <https://doi.org/10.4081/pr.2010.e3>
11. Ahishakiye, A., Abimana, M. C., Beck, K., Miller, A. C., Betancourt, T. S., Magge, H., ... Kirk, C. M. (2019). Developmental outcomes of preterm and low birth weight toddlers and term peers in Rwanda. *Annals of Global Health*, 85(1), 1–11.
<https://doi.org/10.5334/aogh.2629>