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RESEARCH ARTICLE

AWARENESS OF ANEMIA AMONG RURAL PREGNANT WOMEN IN BAGERHAT DISTRICT OF BANGLADESH

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Abstract

Background: Anemia in pregnancy is a decrease in the total red blood cells (RBCs) or hemoglobin in the blood during pregnancy or in the period following pregnancy. It is the condition of having a lower-than-normal number of red blood cells or quantity of hemoglobin. Anemia diminishes the capacity of the blood to carry oxygen. Patients with anemia may feel tired, fatigue easily, appear pale, develop palpitations, and become shortness of breath.

Objectives: The purpose of the present study was to investigate about the awareness of anemia among rural pregnant women in Bagerhat district of Bangladesh

Materials and Method: A sample of 29 pregnant women (PW) from a total of listed 111 women from three upazilas of Bagerhat district was considered for assessing the awareness of Anemia. Those three upazilas were taken at random first from the nine upazilas of Bagerhat district. Data on different variables were collected directly from the selected women through a prescribed questionnaire. Descriptive statistics e.g., maximum, minimum, mean, standard deviation, skewness, kurtosis, etc. of the variables together with their standard error of their estimates were considered for analyzing sample characteristics of the study. The relationship between two nominal variables is assessed by cross tabulation with test statistics Phi and Cramer's V. The bootstrap resampling method was used to understand the population parameters.

Results: About 86% pregnant women have no idea about anemia and also their causes. All respondents feel weakness that indicates they have the symptom of anemia. The phi and Cramer's V imply that the relationship between heard about anemia and the source of information is highly significant ($p = 0.000$). Among the awarded women in Bagerhat district, probability of getting awareness from service provider was 0.917 and that from relatives was 0.083. Among the population, the probability of contribution of the service provider was 0.379. Probability of unknown was 0.586 indicating much population in Bagerhat district were not aware about anemia. Probability of getting information of anemia from mother was zero indicating very recently service providers have started their program in Bagerhat district.

Conclusion: Probability of getting information of anemia from mother is zero indicating very recently service providers have started their program in Bagerhat district. Therefore, this program should be continued until the probability of getting information from mother will be closed to 1.

Recommendation: Government as well as the NGOs should continue & enhance the present awareness program in Bagerhat district.

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..... Introduction:-

Anemia is the condition of having a lower-than-normal number of red blood cells or quantity of hemoglobin that diminishes the capacity of the blood to carry oxygen. Patients with anemia may feel tired, fatigue easily, appear pale, develop palpitations, and become short of breath. Anemia in pregnancy is a decrease in the total red blood cells (RBCs) or hemoglobin in the blood during pregnancy or in the period following pregnancy. Awareness of anemia is the knowledge or perception on anemia or the ability to directly know and perceive, to feel, or to be cognizant of anemia.

Anemia is an amazingly basic condition in pregnancy and postpartum around the world, giving various wellbeing dangers to mother and youngster (Pavord et al., 2012). Maternal signs and symptoms are usually non-specific, but can include: fatigue, pallor, dyspnea, palpitations and dizziness. Awareness of anemia to take control behavior, emotions and give the specific knowledge on anemia and making change in the direction of pregnant women pregnancy life and also very important because when pregnant women will have better understanding on anemia then they will know about the disadvantage of anemia and pregnant women can save themselves from the adverse effect of anemia and the baby in the womb will be healthy and to make improvements in human life. Diminishing iron deficiency is perceived as a significant part of the well-being of women and kids, and the second worldwide sustenance focus for 2025 requires a half decrease of women anemia of contraceptive age (World Health Organization, 2011).

Children and women of reproductive age have the most elevated paces of anemia and among women of reproductive age, non-pregnant women, in numbers, are the most influenced by frailty (~468 million); in any case, pregnant women have the most elevated commonness rates (McNulty et al., 2000). Worldwide figures for the predominance of anemia among non-pregnant and pregnant women are 35% and 51%, individually (McNulty et al., 2000).

The Tabuk locale pregnant knowledge, attitude, practices on IDA who go to in primary health centers. About 25.0% of the pregnant women had history of pallor before pregnancy, 66.7% of them had poor knowledge, and 70.0 % of them had nonpartisan mentality toward iron inadequacy anemia. Furthermore, 40.0 % of them got poor practices score with respect to avoidance of iron deficiency anemia (Aboud, et al., 2019). Pregnant women saw supplementation emphatically yet refereed to absence of information on advantages and dangers, neglect, and conflicting IFA supply as difficulties. Despite the fact that information and consciousness of anemia and IFA supplements were across the board, preeclampsia was for the most part obscure (Birhanu et al., 2016). Maternal anemia among pregnant women who went to get antenatal consideration at center in Dhaka city, about 63% of the subjects had typical degree of hemoglobin, and 37% were anemic followed by 26 % mild and 11 % moderate (Chowdhury et al., 2015). Directed nutritional status of pregnant women in south-west area of Bangladesh, 66.25% pregnant women were supported (counting ordinary 39.62%, over weighted 21.50% and obese 5.13%), 24.75% were moderately malnourished. Especially about 59.50% pregnant women are anemia deficient who were hazard to convey their child. Urban pregnant ladies 68.57% were similarly all around supported than rural pregnant women 61.54% (Rahman et al., 2013). The extent of births at the EmOC (Emergency obstetric consideration) facilities increased 119% from 5.3% to 11.7% addressed issue expanded 141% from 11.1% to 26.6% , and cesarean section as an extent of every normal birth, expanded 151% from 0.5% to 1.3%, while the general case casualty rate decreased by 51% (Islam, et al., 2005). Toteja and her colleagues found that the prevalence of anemia ranges from 33% to 89% among pregnant women and it was more than 60% among adolescent girls (Toteja et al., 2006).

Research on awareness of anemia among pregnant women in Bagerhat district is rare. Thus, the purpose of the present study is to investigate the awareness of anemia among pregnant women in Bagerhat district.

Materials and Methods of the Study:-

A sample of 29 pregnant women (PW) from a total of listed 111 women from three upazilas of Bagerhat district was considered for assessing the awareness of anemia. Those three upazilas were taken at random first from the nine upazilas of Bagerhat district. Data on different variables were collected directly from the selected women through a questionnaire. The variables were household size, occupation of the husband, source of income, age, education, occupation, gravida, knowledge about anemia, and different experiences on anemia of the pregnant women. The resampling technique, namely bootstrap method, was applied as the sample size was small.

Descriptive statistics e.g., maximum, minimum, mean, standard deviation, skewness, kurtosis, etc. of the variables together with their standard error of estimates were considered for analyzing sample characteristics of the study. The relationship between two nominal variables is assessed by cross tabulation with statistics Phi and Cramer's V (Yule GU, 1919). Probability of getting awareness was assessed by correspondence analysis (Greenacre, M, 2007, Izenman, 2008).

Results:-

Frequency distribution and descriptive statistics like, sample size, range, maximum, minimum, mean, standard deviation, skewness, and kurtosis of the variables household size, occupation of the husband, source of income, age, education, occupation, gravida, knowledge about anemia, and different experiences on anemia of the pregnant women are shown in the following Table 1 and Table 2, respectively. Table 1a shows that about 34.5% husband of pregnant women were farmer, followed by 10.3% were woodmaker, 17.2% were van driver, 17.2% were business men, 17.2% were job holder, and 3.4% were masonry. Therefore, the study area may be treated as lower middle income area shows that all the pregnant women were house wife, i.e., they have no job other than house work and shows heard about anemia 41.4% in and not heard about anemia 58.6% out of total number of pregnant women in the study. The frequency table shows among the pregnant women who have known or heard about anemia from service provider 37.9% and relatives 3.4%.

Table 1:- Frequency distribution of different variables.

Table 1: Frequency distribution of different variables.																
Occupation of the husband of PW	%	Bootstrap for Percenta			Occupation of the PW	%	Heard about Anemi a	%	Bootstrap for Percenta			Source of Information	%	Bootstrap for Percenta		
		Bias	95% Confidence Interval						Bias	95% Confidence Interval				Bias	95% Confidence Interval	
			Low er	Uppe r						Lower	Upper				Lower	Upper
Farmer	34.5	.3	17.2	51.7	House wife	Yes	41.4	.2	24.1	58.6	Service provider	37.9	.3	20.7	55.2	
Wood maker	10.3	.1	.0	24.1		No	58.6	-.2	41.4	75.9	Relatives	3.4	-.1	.0	10.3	
van Driver	17.2	.1	3.4	31.0							Unknown	58.6	-.2	41.4		
Business	17.2	.1	3.5	31.0												
Job	17.	.	6.9	31.0												
					100.0											

Source of data: Primary data collected and compiled by the authors.

Symptoms of anemia (central)	%	Bootstrap for Percent ^a			Eye yellowing	%	Bootstrap for Percent ^a		Skin	%	Bootstrap for Percent ^a		Blood vessels	%	95% Confidence Interval				
		Bias	95% Confidence Interval				Bias	95% Confidence Interval			Bias	95% Confidence Interval			Bias	95% Confidence Interval			
			Lower	Upper				Lower				Upper				Lower	Upper	Lower	Upper
Fatigue	13.8	-.2	3.4	27.6	Yes	34.5	-.3	17.2	Palleness	6.9	-.2	.0	17.2		89.7	-.1	75.9	100.0	
Dizziness	10.3	-.1	.0	20.7	No				Coldness	3.4	.0	.0	10.3	No		.1	.0	24.1	
both fatigue and dizziness	65.5	.3	48.3	82.8		65.5		82.8	Yellowing	24.1	-.1	10.3	41.4						
No	10.3	.1	.0	24.1				No		65.5	.3	48.3	82.8		10.3				
Total	100.0	.0	100.0	100.0	Total	100.0	.0	100.0	Total	100.0		100.0	100.0	Total	100.0	4.5	.0	100.0	

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The respondents according to their symptoms of anemia (central) is shown in table 1b that divulged fatigue 13.8%, dizziness 10.3%, both fatigue and dizziness 65.5% and no symptoms of anemia (central) 10.3%.

The table 1b shows that symptoms of anemia (Eye yellowing) among the total respondents, 34.5% have eye yellowing and 65.5% have no eye yellowing. While for symptoms of anemia (Skin) among the total respondents, 6.9% have paleness in addition bootstrapped percentiles lower 0% and upper 17.2%, 3.4%, 24.1% have yellowing and 65.5% have no symptoms of anemia (skin). This Table also shows that symptoms of anemia blood vessels among the total respondents, 89.7% have low blood pressure in addition bootstrapped percentiles lower 75.9% and upper 100%, 10.3% have no low blood pressure. Also, symptoms of anemia heart among the total respondents, 17.2% have palpitation, 37.9% have rapid heart rate 37.9% have both palpitation and rapid heart rate and, 6.9% have no symptoms of anemia heart. In the symptoms of anemia respiratory among the total respondents, 51.7% have shortness of breath and 48.3% have no shortness of breath. For symptoms of anemia muscular, all respondents are feeling weakness. For symptoms of anemia intestinal among the total respondents, 51.7% have changed stool color and 48.3% have no change of stool color. For symptoms of anemia spleen among the total respondents, 6.9% have enlargement of spleen and 93.1% have no enlargement of spleen.

Table 1 (c)											
Knowledge causes of anemia						Nutritious feeding system of the pregnant women					
	%	Bias	Std. Error	Lower	Upper		%	Bias	Std. Error	Lower	Upper
Iron deficiency	13.8	-.2	6.4	3.4	27.6	should take 3 regular meals and 2 snacks with more nutritious food	10.3	-.1	5.9	.0	20.7
Don't Know	86.2	.2	6.4	72.4	96.6	Should take fish, meat, egg, milk, liver, thick lentil, deep green vegetable, seasonal food.	34.5	.1	8.4	17.2	51.7
Total	100.0					should take 3 regular meals and 2 snacks with more nutritious food and should take fish, meat, egg (1 & 2)	17.2	-.2	7.0	3.4	31.0
						should take 3 regular meals and 2 snacks with more nutritious food and should take IFA (1 & 3)	3.4	.0	3.4	.0	10.3
						Don't know	34.5	.2	8.7	17.3	51.7
						Total	100.0	.0	.0	100.0	100.0

The Table 1c shows that knowledge causes of anemia among the total respondents 13.8% addressed iron deficiency and 86.2% didn't know about causes of anemia. This table shows nutritious feeding system of the pregnant women among the total respondents, 10.3% should take 3 regular meals and 2 snacks with more nutritious food, 34.5% Should take fish, meat, egg, milk, liver, thick lentil, deep green vegetable, seasonal food, 17.2% should take 3 regular meals and 2 snacks with more nutritious food with should take fish, meat, egg, milk, liver, thick lentil, deep green vegetable, seasonal food, 3.4% should take 3 regular meals and 2 snacks with more nutritious food and should take IFA and 34.5% don't know about nutritious feeding system of the pregnant women. To overcome the problem of small sample size, resampling technique, named bootstrap, was applied for each variable and the results shown in

table no. 1, 1(a), 1(b) from this result, it is observed that biases are very small that indicates our sample statistics are useful for inference.

Descriptive statistics, e.g., sample size, range, and minimum, maximum, mean, variance, skewness, kurtosis and the standard error of the statistics are shown in Table 2. This table divulges that on average the family size under the study area is about 4 with very insignificant standard error of the estimate.

On the basis of the sample, the age of the pregnant women for the whole Bagerhat district will be in the age interval $((24 \pm 1.13) \pm 5.9)$. It is for schooling year of pregnant women, the limits are $((8.41 \pm .37) \pm 1.97)$ indicating education level of the pregnant women of Bagerhat district laying within secondary school certificate level. For number of pregnancy (gravida), the estimated population mean is $((1.97 \pm 0.19) \pm 1.02)$ implying that the gravida in Bagerhat district is 1 to 3, on average. Positive skewness of household size, age and gravida indicate that their average has a tendency towards left while it is towards right for negative skewness of schooling year of the pregnant women. The value of kurtosis implies that the variables household size, school year and gravida of the pregnant women are more condensed towards mean than that of them.

Table 2:- Descriptive Statistics for pregnant women.

	N	Minimum	Maximum	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	SE	Statistic	Statistic	Std. Error	Statistic	SE
Number of house hold members	29	2	10	4.03	.300	1.614	1.910	.434	8.537	.845
Age of the pregnant women (Years)	29	16	34	24.00	1.103	5.940	.273	.434	2.499	.845
Schooling year of the pregnant women	29	3	12	8.41	.366	1.973	-.356	.434	4.236	.845
Number of the pregnancy	29	1	5	1.97	.189	1.017	.948	.434	3.967	.845

Table 3:- Relationship between heard about anemia and source of information.

		Value	p value
Nominal by Nominal	Phi	1.000	.000
	Cramer's V	1.000	.000
	Contingency Coefficient	.707	.000
N of Valid Cases		29	

The phi, Cramer's V and contingency coefficient (in Table 3) imply that the relationship between heard about anemia and source of information is highly significant ($p = 0.000$).

Correspondence Analysis**Table 4:-** Probabilities getting from Correspondence analysis.

Heard about Anemia	Source of Information				
	Service provider	Parents	Relatives	Unknown	Active Margin
Yes	.917	.000	.083	.000	1.000
No	.000	.000	.000	1.000	1.000
Mass	.379	.000	.034	.586	1.00

From Table 4, the row profile show in the Bagerhat district among the awarded women probability of getting awareness from service provider is 0.917 and from relatives 0.083. Among the population the contribution the service provider is 0.379. Probability of unknown is 0.586 indicating much population in Bagerhat district does not know what is anemia. Probability of getting information of anemia from mother is zero indicating very recently service providers have started their program in Bagerhat district. Therefore, this program should be continued until the probability of getting information will be closed to 1.

Discussion:-**Table 5:-** Comparison between present and previous studies.

Authors	Ethnic Group	Variable Selected	Method Applied	Key Results	Concluding Remarks
de Sã; et al.(2015)	pregnant women in Brazil	Age, education, menarche, gynecological age, gestational age, supplementation pre-gestational, weight gain prenatal consultations pre-gestational BMI, current BMI	Anthropometric measure, Blood test, test of umbilical cord mean, SD	53.7% mother and 32.6% newborns were affected with anemia Half the newborns were anemic children of anemic mothers 79.3% of the anemic pregnant women had mild anemia and 20.7% had moderate	Mild anemia is found Nutritional status is not associated.
Imdad, A et al. (2012)	Pregnant women in different countries	A low-energy drink, nutritional education only, social protein-energy supplementation, high protein-energy supplement, malnourished women, adequately nourished women.	Meta analysis	Balanced protein-energy supplementation is an effective intervention to reduce the prevalence of LBW and small-for-gestational-age births, especially in undernourished women.	Supplementation is predominant of LBW and little for-gestational-age births in undernourished women.
Merrill, R. D. et al.(2012)	Pregnant women in rural Bangladesh	Age, Parity, Education Wealth Index Anthropometry Biochemical Status	Stratified and Adjusted Analysis	Parity was associated with anemia who have thalassemia (28% prevalent).	Sources of iron and the role of thalassemia is contributing anemia.
Ahmed, et al.(2000)	Teenager (Female) urban Bangladesh	Age Body Mass Index (BMI) Midupper arm circumference (MUAC) Triceps skin fold	Double-blind Hemoglobin test ANOVA	Those with the lowest baseline hemoglobin had the greatest increase in hemoglobin. Compared with the placebo, iron + folic acid + vitamin A reduced	Enhances the nutritional status of iron, folate, and vitamin is essential for

		thickness Income Food expenditure Family size		anemia by 92%, iron deficiency by 90%, and vitamin A deficiency by 76%.	pregnant.
Khambalia, et al (2009)	Pregnant women rural Bangladesh, Kaliganj subdistrict Bangladesh	Age, Age of marriage, education, socio economic condition, previous miscarriage	Double blinded, Quartile tests, chi-square tests, logistic regression	11% were iron deficient and anemic, and 81% were estimated to have, 500 mg of iron stores. Risk of anemia was 4 times greater among nonstudents than students compared with adults.	80% will have inadequate iron stores, and more than one-tenth will be folate deficient.
Vannest e, A. M et al (2000).	Pregnant Women Matlab, Bangladesh	maternal age, obstetric history, height, moderate and severe anemia, jaundice fever, BP, tribal oedema, diagnosis of twins, height	Pooling Sample method	This population-based cohort study was undertaken to assess whether prenatal screening can identify women at risk of severe labour or delivery complications in a rural area in Bangladesh.	Insignificant differences labor delivery with and without care
Ahmed, Fet al.(2000)	Adolescent schoolgirls in Dhaka	Body weight, height, hemoglobin, serum iron, occupancy, consumption.	one-way ANOVA followed by DMRT Pearson's	The prevalence of anaemia among the participants was 27%. Seventeen percent had depleted iron stores. Of all anaemic girls, 32% had iron deficiency anaemia (Hb<120 g/l	Iron deficiency couldn't be explain
Kamruz zaman et al.(2015)	Non pregnant women in Bangladesh	Demographic, socio economic and nutritional factor	Multilevel logistic regression analysis.	The prevalence of anemia among non-pregnant, ever-married women was 41.3 % (urban: 37.2 % and rural:43.5 %).	The prevalence of anemia is high.
Lindstr Å et al.(2011)	Pregnant women, Matlab, Bangladesh	Age, BMI, gestational age, education	Survey, ANOVA, ANCOVA, Logistics regression	28% women have anemia	Early pregnancy developed iron deficiency.
Islam et al (2001)	Pregnant, non pregnant and lactating in Dhaka and Mymensingh	Socio economic information, BMI, blood haemoglobin, serum iron, serum ferritin	Chi square two way (ANOVA) . Post-hoc test The Mann Whitney U-test	The prevalence of anaemia and iron deficiency (70 and 35% for sub-group L2; 66 and 32% for sub-group H2, respectively) were similar in the pregnant subjects of the two groups.	The pregnant subjects in the two groups was similar as regards iron status.
Present study	Pregnant women in Bagerhat district	Household size, occupation, source of income, age, education, gravida, knowledge about anemia, and different experiences on anemia of the pregnant women.	Descriptive statistics Phi, Cramer's V, coefficient of contingency	About 86% pregnant women have no idea about anemia and also their causes. All respondents felt weakness that indicates they have the symptom of anemia.	Awareness program should be extended.

Anemia of pregnant women is the big problem in the world. A meta-analysis with different ethnic group in the world suggest that balanced protein-energy supplementation is an effective intervention to reduce the prevalence of LBW and small-for-gestational-age births, especially in undernourished women (Imdad, A et al., 2012).

Bangladesh is also facing a great problem with this disease (From Table 5). Present study found that 58.6% pregnant women have no idea about anemia but they are suffering different type of anemia symptoms. Anemia is the causes and nutritional deficiencies during the pregnancy and the level of maternal anemia was 53.7% and newborns 20.7%. About 79.3% suffered mild anemia and 20.7% moderate of pregnant women.

Anemia may not be a direct cause of poor pregnancy outcomes, except in the case of maternal mortality resulting directly from severe anemia due to hypoxia and heart failure. Preventing or treating anemia, whether moderate or severe, is desirable. Because iron deficiency is a common cause of maternal anemia, iron supplementation is a common practice to reduce the incidence of maternal anemia. The nutritional status of a woman before and during pregnancy is important for a healthy pregnancy outcome. Maternal malnutrition is a key contributor to poor fetal growth, low birthweight (LBW) and short- and long-term infant morbidity and mortality.

Nutritional deficiencies are still a common problem during pregnancy causing anemia. Gestational anemia is still considered a public health problem in Brazil, because it is hazardous to both mother and fetus, and is associated with increased risk of maternal-fetal morbidity, as well as the nutritional status of child. A high frequency of mild anemia in pregnant women and in newborns is found, but the maternal nutritional status is not associated with the development of anemia in both mother and child at birth in Brasil (de Sá et al., 2015).

Maternal hunger is a key supporter of poor fetal development, low birth weight (LBW) and short-and long term infant morbidity and mortality (Imdad et al., 2012). Gestational anemia is as yet viewed as a general medical issue in Brazil, since it is unsafe to both mother and baby, furthermore, is related with expanded danger of maternal-fetal danger, just as the nourishing status of youngster. Iron inadequacy was missing in an ongoing population evaluation of rural Bangladeshi women exhibiting anemia (57%), proposing different reasons for low hemoglobin. The relative effect on anemia of thalassemia, groundwater arsenic and iron, and diet among women of reproductive age living in rural Bangladesh were significantly found (Merrill, et al., 2012). Anemia among these pre-adult students in peri-urban Bangladesh can't be clarified by iron deficiency alone, and different causes may likewise exist in this populace (Ahmed, et al., 2000). Recent evidence suggests that poor fetal growth is associated with preconception anemia and first trimester iron deficiency (Khambalia, et al. 2009). The low predictability of antenatal markers for adverse maternal outcomes has led some to reject antenatal care as an efficient strategy in the fight against maternal and parental mortality (Vanneste, et al., 2000).

The present study reflected in accord with the previous studies. Our study area is more or less poor, less educated and lack of awareness of anemia. The phi and cramer's V imply that the relationship between heard about anemia and source of information is highly significant ($p = 0.000$). Much population in Bagerhat district does not know what is anemia.

Conclusion:-

The study area is lower middle income area where all the pregnant women were house wife, i.e., they have no job other than house work and 58.6% of them didn't hear about anemia. According to their symptoms of anemia (central) is both fatigue and dizziness 89.7%. Symptoms of anemia for skin, among the total respondents 6.9% paleness, 3.4% coldness 24.1% yellowing and 65.5% have no symptom. For symptom of anemia in blood vessels, among the total respondents 89.7% low blood pressure. For symptoms of anemia of heart, among the total respondents 17.2% have palpitation, 37.9% have rapid heart rate, 37.9% have palpitation & rapid heart rate and only 6.9% have no symptom. For symptoms of anemia of respiratory, among the total respondents 51.7% have shortness of breath and but 48.3% have no shortness of breath. For symptom of anemia of muscular, all the respondents were feeling weakness. For symptom of anemia of intestinal, among the total respondents 51.7% have change of stool color. For symptom of anemia of spleen, among the total respondents 6.9% have enlargement of spleen.

For knowledge causes of anemia, among the total respondents 13.8% have iron deficiency and 86.2% don't know about causes of anemia.

The phi and cramer's V imply that the relationship between heard about anemia and source of information is highly significant ($p = 0.000$). Among the awarded women in Bagerhat district, probability of getting awareness from

service provider is 0.917 and that from relatives is 0.083. Among the population, the contribution the service provider is 0.379. Probability of unknown is 0.586 indicating much population in Bagerhat district does not know what is anemia. Probability of getting information of anemia from mother is zero indicating very recently service providers have started their program in Bagerhat district. Therefore, this program should be continued until the probability of getting information from mother will be closed to 1.

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