ORIGINAL RESEARCH ARTICLE

A comparative study of the effect of health insurance on women's use of health facility delivery: Evidence from demographic health survey in Benin Republic

DOI: 10.29063/ajrh2022/v26i6.12

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Abstract

Studies in the Benin Republic have identified contextual factors that determine health facility delivery among women of reproductive age. However, it is not certain if the same set of factors predicts facility delivery for women who enrolled in health insurance and those who did not. The study seeks to compare the determinants of health facility delivery for mothers under health insurance and those that are not in the Benin Republic. The study used data for 33,078 women of reproductive age, drawn from the most recent Benin demographic and health survey (2017-18). The characteristics of the women were described using simple proportions and frequency. Binary Logistic regression was used to examine determinants of health facility delivery for both groups of women. The result showed that only 0.7% of the women were under health insurance coverage. The prevalence of health facility delivery was high in the enrolled group but not in the unenrolled group (98.3% vs. 87.8%). The uniform determinants of health facility delivery across the two groups were household wealth, education, employment, land/house ownership, media exposure, a minimum of four antenatal contacts, and place of residence. To improve the coverage of health facility delivery, a multi-pronged approach should be used to improve household socioeconomic status, encourage media use among women, expand education opportunities for women, and specifically target rural women in Benin. *(Afr J Reprod Health 2022; 26[6]:104-115).*

Keywords: Health facility, health management, health insurance, reproductive-age women

Résumé

Des études en République du Bénin ont identifié des facteurs contextuels qui déterminent la prestation de services de santé chez les femmes en âge de procréer. Cependant, il n'est pas certain que le même ensemble de facteurs prédise l'accouchement en établissement pour les femmes inscrites à l'assurance maladie et celles qui ne l'ont pas fait. L'étude vise à comparer les déterminants de l'accouchement en structure sanitaire pour les mères sous assurance maladie et celles qui ne le sont pas en République du Bénin. L'étude a utilisé les données de 33 078 femmes en âge de procréer, tirées de la dernière enquête démographique et sanitaire du Bénin (2017-18). Les caractéristiques des femmes ont été décrites à l'aide de proportions et de fréquences simples. La régression logistique binaire a été utilisée pour examiner les déterminants de l'accouchement dans les établissements de santé pour les deux groupes de femmes. Le résultat a montré que seulement 0,7% des femmes étaient couvertes par une assurance maladie. La prévalence de l'accouchement dans les établissements de santé était élevée dans le groupe inscrit mais pas dans le groupe non inscrit (98,3 % contre 87,8 %). Les déterminants uniformes de la prestation dans les établissements de santé dans les deux groupes étaient la richesse du ménage, l'éducation, l'emploi, la propriété foncière/maison, l'exposition aux médias, un minimum de quatre contacts prénatals et le lieu de résidence. Pour améliorer la couverture de la prestation des services de santé, une approche à plusieurs volets devrait être utilisée pour améliorer le statut socio-économique des ménages, encourager l'utilisation des médias chez les femmes, élargir les possibilités d'éducation pour les femmes et cibler spécifiquement les femmes rurales au Bénin. *(Afr J Reprod Health 2022; 26[6]:104-115).*

Mots-clés: Établissement de santé, gestion de la santé, assurance maladie, femmes en âge de procréer

Introduction

Skilled delivery conducted in health institutions has been recommended as the single most important health system strategy to safeguard the lives of mothers and their unborn babies[1-3]. Research evidence shows that the rate of non-facility delivery remains high among developing countries despite various forums canvassing for increased health facility delivery[4]. Therefore, encouraging more women to deliver their babies in health institutions in developing countries is an important health system strategy to promote women's health, reduce infant mortality and enhance the achievement of the Sustainable Development Goals (SDGs), especially, SDG 3.1, to promote good health and well-being[4,5].

In literature, it is accepted that preference for health insurance facilitates that utilize modern maternal care can be advanced by eliminating the financial barriers that mitigate quality healthcare services[6-11] This positive effect of health insurance enrolment on modern maternal care should be adequately explored to increase coverage of health facility delivery among women of reproductive age in developing countries. Contrary to expectation, research findings revealed that some women, despite their enrolment in health insurance, delivered their babies outside health institutions[12-14]. This finding arouses curiosity on the nature of relationship that exists between health insurance enrolment and utilization of modern maternal care services. In the light of the foregoing, there is the need for further research evidence on determinants of health facility delivery among developing countries.

Existing studies among developing countries have reported several determinants of health facility delivery, such as maternal age, parity, family type, household wealth index, place of residence, maternal education, employment status, and number of living children[15-22]. Other studies have revealed community contextual determinants of health facility delivery[23-26] to include cultural attitudes of wife-beating/domestic violence, community poverty, community literacy, community fertility norms, community media saturation, community birth control, and community number of child preference. However, it is not established in the literature if these variables have a uniform influence on facility delivery for women under health insurance and those who are not. This informs the important subject of this paper.

A few studies have identified that women who subscribe to health insurance tend to be wealthier and may come from better socioeconomic background compared to those who did not enroll[27-29]. This may be a pointer that different determinants of health facility delivery exist for women under health insurance coverage. However, few or inadequate studies have been carried out to examine the determinants of health facility delivery and their varying outcomes among women with or without health insurance coverage in Benin Republic. In the light of the foregoing, this study undertakes a comparative analysis of the predictors of health facility delivery for women that subscribe to health insurance and those without insurance cover Benin Republic. The knowledge of the different determinants for both sets of women will yield insight on the peculiar determinants of health facility delivery for women enrolled in health insurance schemes and those not enrolled; Furthermore, the study will provide the required information for repositioning health insurance policy to cater for the peculiar needs of women in both groups.

Benin context

Benin Republic, like most African countries, has poor health outcomes[30] Recent evidence puts the maternal mortality ratio (MMR) at 397 per 100,000 live births, which is higher than the global average of 211 per 100,000 live births[31.] Notably, private health spending accounts for the bulk of health spending, (put at around 50% of total health spending) and out-of-pocket spending accounts for roughly 44.6% of the total health spending in 2018[31]. The country is confronted with the challenge of access to healthcare[32.] Evidence shows that only 8.4% of the population are under coverage by some form of health insurance[32.] Currently, the health system in Benin is highly fragmented in

nature, with many coexisting financial protection schemes that cover civil servants, retirees, and employees of the formal sector, amidst targeted fee exemptions and voluntary community-based health insurance[32.]

Community-based health insurance in Benin is not novel as there are over 200 such schemes existing in the country operating with the assistance of international development partners. Sadly these schemes are limited in their scope as they cater to barely 5% of the population[32]. Due to its limited coverage, the health scheme is not regarded as a relevant actor in the conceptualization and implementations of the Universal Health Coverage (UHC) in Benin Republic. In a bid to achieve UHC, in 2016, the government of Benin Republic started the process of implementing a compulsory social health insurance programme known as RAMU (Regime d' Assurance Malade Universelle). The first stage has been piloted and covered only federal government workers. The second phase is expected to cover those in the informal sector, owners of private health insurance and those under health scheme The programme is expected to offer compulsory health enrolment for the entire population with a monthly premium fee ranging from $3 to $30, expected to be paid in regular installments. Though, RAMU is still in its nascent stage, the NDHS (2017-18) provided information on women's ownership of health insurance in Benin Republic, which covers principally enrolment in voluntarily community-based health insurance.

Study design

The study adopts a cross-sectional research design. The design, comparative in nature, grouped women, surveyed in the Benin Demographic and Health Survey (National Population Commission, 2017-18) into two- those enrolled into health insurance and those who did not. The research design helps in examining the predictors of health facility delivery for both groups of women.

Data and sample

Secondary data extracted from the DHS, 2017-18 for Benin Republic was used for the analysis. The DHS is the fifth of its kind for the Benin Republic. It is a nationally representative survey funded by the United States Agency for International Development (USAID). It used a stratified multi-stage cluster random sampling technique and utilized households as the sampling units. Within each household, all eligible women are interviewed using a structured –interviewer-administered questionnaire. Details of the data collection procedure have been reported elsewhere[31]. Only women who gave birth in the last five years prior to the study were included in the study. About 33,078 women of the reproductive ages who gave birth in the last five years preceding the survey were included in the study. The sample observation was then divided into two groups; those enrolled into health insurance (266) and those not enrolled (32, 852). Separate analyses were undertaken for both groups of women.

Outcome indicators

The dependent variable for this study is health facility delivery, which is categorical in nature. Delivery that took place in health institutions whether public or private were termed health facility delivery, while those that took place outside health institutions were termed non-health facility delivery. Health facility delivery was coded 1, while non-health facility delivery was coded 0.

Independent variables

Drawing from Andersen and Newman's34 behavioral model and previous studies on the determinants of health facility delivery among women, the following independent variables were selected: maternal age, maternal education, healthcare decision autonomy, frequency of listening to the radio, frequency of watching television, the total number of children ever born, sex of head of household, number of antenatal care contacts, household wealth quintiles, employment status, land ownership, house ownership, pregnancy status, birth order and place of residence. The selection of the variables was based on Andersen and Newman's34 behavioral models. According to this model, there are three

determinants of healthcare utilization that include the predisposing factors, enabling factors and need-based factors. The predisposing factors explain the inclination of an individual towards the use of healthcare services before ill-health. They include the demographic characteristics of the individual (age, sex, marital status), social structure (education, occupation, ethnicity), and health beliefs. Health beliefs in this regard, refer to the values and knowledge about health and the healthcare system that influence health service utilization including general attitudes towards medical care, health practitioners and ill-health.

Enabling factors are the resources found both within community and family levels. Enabling factors (personal and organization) must be present for individuals to utilize healthcare services. Personal enabling resources include income, health insurance, and a regular source of healthcare, traveling, and waiting time. Organizational enabling factors comprise the availability of healthcare providers and their spatial distribution. By contrast, need-based characteristics include the perception of needs for health services, whether individual, socially, or clinically evaluated the perception of need[35]. In this study, predisposing factors included are maternal age, maternal education, healthcare decision autonomy, frequency of listening to the radio, frequency of watching television, and sex of head of household. On the other hand, enabling factors included are employment status, land ownership, house ownership, and household wealth quintiles. A need-basedbased factors included are pregnancy status, number of ANC contacts, and birth order. Finally, we included the place of residence as control variable.

Model specification

To explore the determinants of health facility delivery, we adopt the logistic regression model[36]. The model is a dichotomous binary response variable in which one (1) is assigned if a respondent delivered her last child in health institution and zero (0) if otherwise. The dichotomous regression variable is considered as the dependent variable. The model has advantages over others (multiple regression) because it ensures prediction of probability of choice within ranges (1 or 0), easier and more convenient to compute since it is based on cumulative ordered logistic probability function[36.]

The logit characterizing the use of maternal care is therefore specified as follows:

$$P_i = P\left(Y_i = {}^{1}/_{xiJ}\right) = \frac{1}{1+e^{-zi}} = \frac{e^{zi}}{1+e^{zi}} \qquad (1)$$

Similarly,

$$P_i = P\left(Y_i == {}^{0}/_{xiJ}\right) = 1 - P\left(Y_i = {}^{1}/_{xiJ}\right) = \frac{1}{1+e^{-zi}} \quad (2)$$

Where:

$$Z_{it} = \beta_0 + \beta_1 x_{it} + - - - - - + \beta_{15} x_{15} + \mu_{it} \quad (3)$$

Pi = probability that Y_i takes the values of 1, 1-Pi = probability that Y_i takes the value of 0
e = exponential constant.

β_1 to β_{15} = estimated coefficients.
Z_{it} = vector of variables influencing health facility delivery.
Y_i = health facility delivery
X_1 = maternal age
X_2 = maternal education
X_3 = healthcare decision autonomy
X_4 = frequency of listening to the radio
X_5 = Frequency of watching television
X_6 = Total number of children ever born
X_7 = sex of head of households
X_8 = Household wealth quintile
X_9 = Employment status
X_{10} = Land ownership
X_{11} = House Ownership
X_{12} = Pregnancy status
X_{13} = Number of ANC contacts
X_{14} = Birth order
X_{15} = Place of residence

Statistical analysis

Data analyses were undertaken in two stages. In stage 1, simple proportion and frequencies were used to describe the characteristics of the women.

In stage two, binary logistic regression was used to examine determinants of health facility delivery. Separate analyses were conducted for women enrolled into health insurance and those not enrolled. For each estimated model, we presented the adjusted odds ratio, 95%-confidence interval and probability values. All statistical analyses were conducted at 5% level of significance.

Results

Respondents' socio-demographic characteristics

In Table 1, the socio-demographic characteristics of the women for both groups are presented. We noted that a higher proportion of the women were not under health insurance coverage (99.3%); while only an insignificant number enrolled in health insurance (0.7%). A higher proportion of women under health insurance were within the age group (25-34 years). Enrolment into health insurance increased consistently as educational attainment improved. Higher proportion of women were noted to be enrolled in health insurance with higher educational attainment compared to those with lower educational attainment. In both groups, the majority of the women were employed regardless of enrolment in health insurance. Women under health insurance enrolment had better socioeconomic conditions compared to those without health insurance. For instance, the analysis of the distribution of household wealth quintile revealed that 92.9% of women with health insurance were located in the wealthiest quintile compared to 17.3% of those who were without health insurance located in same wealth quintile. Women with health insurance are at advantage, in their being able to meet a recommended number of four antenatal care contacts and having their deliveries supervised in health institutions (see Figure 1).

Determinants of health facility delivery among women not enrolled in health insurance

In table 2, the second column shows the odds of health facility delivery among mothers not enrolled in health insurance. In reference to mothers aged (15-24) years, those aged (25-34) years (AoR = 0.67; 95% CI: 0.11-1.23; P = 0.02) and those aged (35-49) years (AoR = 0.21; 95% CI: 0.67-0.89; P= 0.03) were significantly less likely to deliver their babies in health facilities. The odds for health facility delivery improve with educational attainment. In reference to mothers with non-formal education, those with primary education (AoR = 1.27; 95% CI: 0.98-1.78; P < 0.01); secondary education (AoR = 3.45; 95% CI: 1.11-4.34; P < 0.001); and post-secondary education (AoR = 6.89; 95% CI: 0.67-7.45; P= 0.02) were significantly more like to deliver their babies in health facilities. The household wealth quintile has a consistently positive relationship with health facility delivery. The odds for health facility delivery increased as the household wealth quintile improved. Women who met the recommended number of four antenatal contacts (AoR= 9.87; 95% CI: 0.56-10.98; P = 0.01) reported an approximately ten-fold increase in the odds for delivering babies in health facilities. Urban residence (AoR= 9.87; 95% CI: 0.56-10.98; P = 0.01) was associated with higher odds for health facility delivery. Finally, employed mothers, land ownership, house ownership, mothers who desired their pregnancies, those who reported a birth order of ≥ 5, women who were autonomous in healthcare decisions, those from female-headed households and women who watches television and listen to the radio at least once a week were more likely to deliver their babies in health institutions.

Determinants of health facility delivery among women enrolled in health insurance

Table 2 third column shows the odds of health facility delivery among women enrolled in health insurance. In reference to mothers who had no formal education, those who had primary education (AoR= 2.13; 95% CI: 0.78-2.45; P = 0.01); secondary education (AoR= 3.45; 95% CI: 0.11-4.34; P = 0.02); and post-secondary educational qualifications (AoR= 4.11; 95% CI: 0.87-4.45; P = 0.03) had higher odds to deliver in health institutions. In reference to mothers from the poorest wealth quintile, those from poorer quintile

Table 1: Percentage distribution of respondents by sociodemographic characteristics, Benin (2017-18), DHS

Variables	Women not under health insurance	Women under health insurance
Maternal age (years):		
15-24	25.1	7.1
25-34	50.3	67.9
35-49	24.6	25.0
Maternal Education:		
Non-formal	68.6	17.9
Primary	17.3	17.9
Secondary	13.2	28.6
Post-secondary	0.9	35.6
Healthcare Decision Autonomy:		
No	41.4	67.7
Yes	58.6	32.3
Frequency of listening to the radio:		
Not at all	44.2	28.6
At least once a week	20.8	7.1
All the time	34.9	64.3
Frequency of watching television:		
Not at all	66.4	7.1
At least once a week	16.9	7.1
All the time	16.7	85.8
Total number of children ever born:		
1	15.7	10.7
2	17.8	25.0
3	17.8	25.0
4	14.5	17.9
≥5	34.2	21.4
Sex of head of households:		
Male	96.9	89.3
Female	3.1	10.7
Household wealth quintiles:		
Poorest	24.0	-
Poorer	21.4	3.6
Average	18.6	-
Wealthy	18.7	3.6
Wealthiest	17.3	92.8
Employment status:		
Working	19.7	3.6
Non- working	80.3	96.4
Land ownership:		
No	81.8	85.7
Yes	18.2	14.3
House ownership:		
No	82.3	89.3
Yes	17.7	10.7
Pregnancy status:		
Desired	80.8	65.4
Not desired	19.2	34.6
Number of ANC contacts:		
≤ 3	40.6	14.8
≥4	59.4	85.2
Birth order:		
1	18.6	11.6
2	18.9	12.3
3	17.9	16.8
4	18.9	23.5
≥5	25.7	35.8
Place of residence:		
Rural	39.1	10.7
Urban	60.9	89.3

(AoR= 2.34; 95% CI: 0.23-3.45; P = 0.04); average quintile (AoR= 3.67; 95% CI: 0.11-4.34; P = 0.01); wealthier quintile (AoR= 4.67; 95% CI: 0.45-4.78; P = 0.03) and wealthiest quintile (AOR= 6.78; 95% CI: 1.23-7.45; P = 0.04) were significantly more likely to deliver in health institutions. Women who reported at least four antenatal care contacts (AoR= 2.34; 95% CI: 0.45-2.45; P = 0.02) were approximately twice as likely to deliver in health institutions compared to mothers who reported ≤ 3 antenatal care contacts. Women from urban areas (AoR= 13.45; 95% CI: 0.45-21.98; P= 0.04) were significantly more likely to deliver in health institutions, compared to rural women. Finally, employed mothers, land ownership, house ownership, those from female-headed households and women who watch television and listen to the radio at least once a week were more likely to deliver their babies in health institutions.

Discussion

The study compares the predictors of health facility delivery for women who had health insurance coverage and those who did not in the Benin Republic. This is one of the grey areas that were not covered by studies that examined the influence of health insurance on maternal care utilization[6,13-14]. Thus, the study contributed significantly to the existing literature by highlighting determinants of health facilities that cut across women with health insurance coverage and those that are not, and those peculiar to enrollees only. Secondary data hoisted in a public domain was used for the analysis, thereby making it possible for similar studies to be replicated in other countries. The Andersen and Newman[34] model provided the framework for the selection of variables for the analysis. The results validated the proposition made by Andersen and

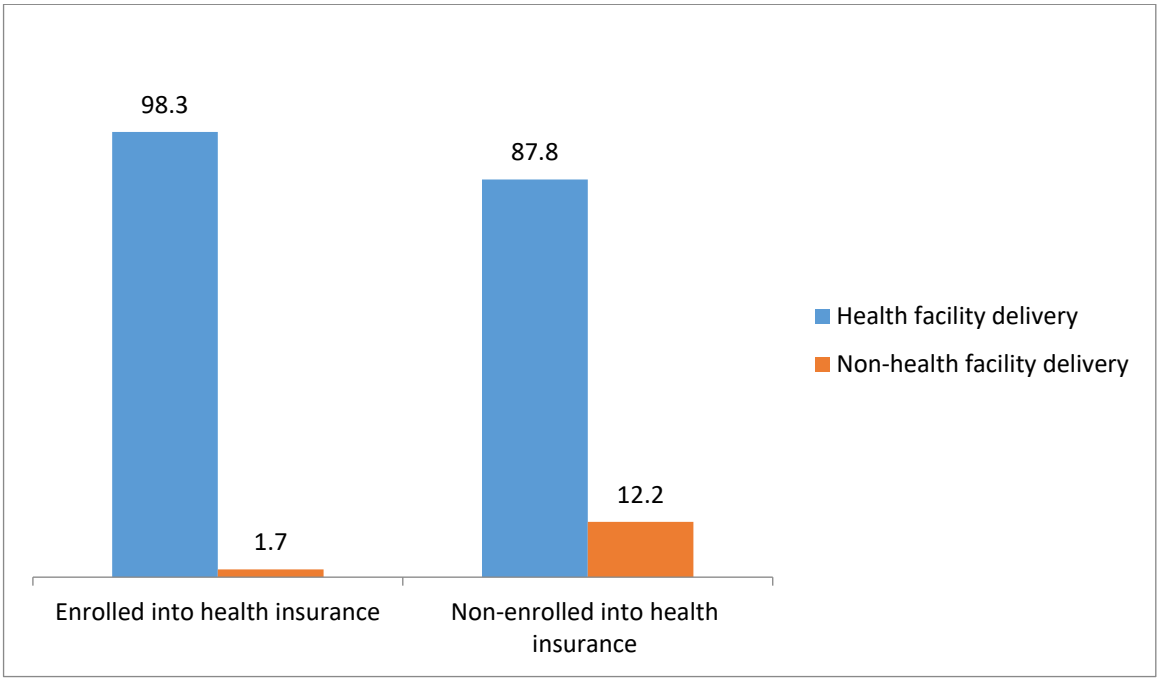

Figure 1: Proportion of women who made at least four antenatal contacts and deliver in health facilities across women who enrolled in health insurance and those who did not

Table 2: Odds of health facility delivery for women not enrolled and those enrolled in health insurance

Variables	Women not under health insurance		Women under health insurance	
	AOR (95% CI)	P-value	AOR (95% CI)	P-value
Maternal age (years):				
15-24	1.0	-	1.0	-
25-34	0.67(0.11-1.23)	0.02**	1.45(0.12-2.11)	0.26
35-49	0.21(0.67-0.89)	0.03**	2.34(0.89-7.68)	0.18
Maternal education:				
Non-formal education	1.0	-	1.0	-
Primary	1.27(0.98-1.78)	< 0.001*	2.13(0.78-2.45)	0.01**
Secondary	3.45(1.11-4.34)	< 0.001*	3.95(0.11-4.34)	0.02**
Post-secondary	6.89(0.67-7.45)	0.02**	4.11(0.87-4.45)	0.03**
Healthcare decision autonomy:				
No	1.0	-	1.0	-
Yes	2.34(0.11-3.34	0.01**	2.78(0.11-3.34)	0.01**
Frequency of listening to the radio:				
Not at all	1.0	-	1.0	-
At least once a week	1.90(1.23-2.78)	0.03**	0.23(0.1-3.34)	0.04**
All the time	2.34(0.78-2.56)	0.04**	2.34(0.23-3.56)	0.02**
Frequency of watching television:				
Not at all	1.0		1.0	-
At least once a week	2.11(0.11-2.34)	0.01**	3.45(0.34-5.67)	0.9
All the time	3.78(2.45-4.78)	0.04**	6.78(0.11-7.45)	0.01**
Total number of children ever born:				
1	1.0	-	1.0	-

2	1.23(0.56-2.23)	0.21	0.56 (0.23-1.45)	0.11
3	3.45(1.23-4.34)	0.56	1.67(0.34-1.98)	0.34
4	4.78(0.98-5.67)	0.33	2.11(0.45-3.67)	0.46
≥5	3.67(0.11-4.34)	0.54	3.45(0.45-4.34)	0.89
Sex of head of household:				
Male	1.0	-	1.0	-
Female	2.79(0.22-3.13)	< 0.0001*	3.45(0.98-4.34)	0.03**
Household wealth quintile:				
Poorest	1.0	-	1.0	-
Poorer	1.22(0.11-2.34)	0.01**	2.34(0.23-3.45)	0.04**
Average	1.89(0.45-6.78)	0.02**	3.67(0.11-4.34)	0.01**
Wealthy	1.98(0.34-2.67)	0.02**	4.67(0.45-4.78)	0.03**
Wealthiest	2.34(1.23-4.78)	0.03**	6.78(1.23-7.45)	0.04**
Employment status:				
Non-working	1.0	-	1.0	-
Working	3.33(0.17-3.67)	< 0.001*	31.56(0.11-32.34)	0.04**
Land ownership:				
No	1.0	-	1.0	-
Yes	3.45(0.11-4.34)	0.01**	2.34(0.34-3.34)	0.02**
Household ownership:				
No	1.0		1.0	-
Yes	2.22(0.11-3.34)	0.01**	3.67(0.11-4.45)	0.03**
Pregnancy status:				
Not desired	1.0	-	1.0	-
Desired	2.34(0.11-3.45)	0.02**	2.34(0.56-2.67)	0.14
Number of ANC contacts:				
≤ 3	1.0	-	1.0	-
≥ 4	9.87(0.56-10.98)	0.01**	2.34(0.45-2.45)	0.02**
Birth order:				
1	1.0	-	1.0	-
2	1.11(0.34-3.67)	0.89	1.78(0.34-2.23)	0.98
3	2.34(0.98-3.45)	0.78	2.34(0.56-3.46)	0.78
4	3.98(0.11-4.34)	0.61	3.11(0.67-3.98)	0.56
≥5	23.67(1.23-26.89)	0.03**	4.56(0.12-4.45)	0.45
Place of residence:				
Rural	1.0	-	1.0	-
Urban	9.87(0.56-10.98)	0.01**	13.45(0.45-21.98)	0.04**

Source: Benin Demographic and Health survey (2017-18).
aOR is adjusted odds ratio
ref is reference category
CI confidence interval
*p < 0.01, **p < 0.05

Newman[34], which was in line with findings made by past studies[16,37-38.]

The result revealed a high rate of health facility delivery for both the enrolled group and the non-enrolled group (98.3% vs. 87.80%). This implies that apart from enrolment in health insurance schemes, there are other factors that could influence women's decision to either deliver in health institutions or not in the Benin Republic. The prevalence of health facility delivery among reproductive-age women in Benin republic was high when compared to what has been reported by previous studies in sub-Saharan African (SSA) countries like Ethiopia-56%[39]; Guinea-38.2%[40]; Ghana-41%[41]; and Nigeria-38%[42.] The disparity in the rate of facility delivery between this particular study and previous studies may be owing to the differences in the population and observed samples. The high prevalence of health facility delivery has implications for safe motherhood in Benin.

The study revealed that only a few of the surveyed women were under health insurance coverage at about 0.7%. The results, however, corroborate findings from some studies in SSA that

reported low health insurance coverage among childbearing women: Nigeria[16,27,43] and Ghana[15]. For women in Benin to optimize the benefits that accrue from taking health insurance, health programmers and planners must look for ways to encourage enrolment into these schemes particularly among women in the informal and rural parts of the country. Some of the key challenges confronting enrolment into the scheme which include high premium charges and lack of money to pay as premiums should be addressed. The government of Benin should subsidize premiums for poor rural women. In addition, health intervention initiatives with public education on the benefits of health insurance should be implemented in Benin Republic.

The result showed that household wealth, maternal education, place of residence, employment status, woman's autonomy and media exposure were uniform determinants of health facility for both women under health insurance and those not under health insurance. These variables have been reported by other studies as determinants of health facility delivery[16-17,19-21]. The implication is that policy makers and health planners desiring to increase coverage of health facility delivery should rather focus more on influencing the afore-mentioned sociodemographic factors. The positive impact of household wealth quintile on health facility delivery was reported by past studies in SSA[16]. The reason for this relationship is that health facility delivery involves a lot of costs so that women from improved economic households can easily pay for healthcare services[5]. The positive impact of education on health facility is in conformity with reports from previous studies[5,17,19,44-46]. This result suggests that Benin government should increase educational opportunities for mothers within the reproductive ages. From the result, a minimum of primary education should be the baseline. The finding that urban women were more likely to deliver in health institutions also conform to the results from previous studies[17,47.]

The high rate of non-institutional delivery among women of reproductive-age recorded in this study has implications for maternal and childcare utilization. First, the percentage of women who give birth at health institutions is low thereby, increasing the risk of maternal and child mortality. It is therefore, recommended that an intervention program to improve coverage of health facility delivery to be implemented to scale down maternal mortality to less than 70 per 100,000 live births, which is the SDG's 3.1 target for 2030..

Limitations

Some limitations were encountered in the course of this study. limitations. First, the relatively small number of women that enrolled in health insurance did not allow for more rigorous comparison. For instance, the study could not explore the potential effects of health insurance on health facility delivery for this reason. However, the difference in the number of those who enrolled and those who do not may not have affected the results, because separate analyses were undertaken for both groups of women. Second, given the cross-sectional nature of the data, the study could not establish cause-effect relationship as only association was established. Third, the data belonged to different date and time. For instance, responses on health facility delivery were limited to five years prior to the survey, but information on sociodemographic factors were based on the time respondents were interviewed. Also, this study did not include community contextual factors in the analysis. Finally, the study engaged the logistic regression analysis, and as a result, could not control for endogeneity. Therefore, future studies should include community contextual factors as determinants of facility delivery for both groups of women**.** Despite these limitations, the study has yielded useful insight on the predictors of health facility delivery among women health insurance enrolees and not enrolees.

Ethical approval and consent to participate

Ethical issues (Including plagiarism, misconduct, data falsification, informed consent, data fabrication, double submission/publication,

redundancy etc.) were completely observed by the authors.

Conclusion and recommendations

The study compared the determinants of health facility delivery for women under health insurance and those that were not in Benin Republic. The results show that barely 0.7% of the women under study were subscribed to any form of health insurance. The results revealed a significant disparity in health insurance enrolment, with more women residing in the urban parts of the country, from wealthy homes, more educated, and reported at least four ANC contacts to have enrolled in health insurance. The prevalence of health facility delivery was high among both groups of women; though higher among those who enrolled in health insurance. The results showed that unique determinants of health facility delivery for women that were not enrolled in health insurance were maternal age, pregnancy status, and birth order. On the other hand, uniform determinants of health facility delivery for both groups of women were maternal education, healthcare decision autonomy, frequency of listening to the radio, frequency of watching television, sex of head of households, household wealth quintile, employment status, employment status, land ownership, house ownership, place of residence and number of ANC contacts. Based on the results, we recommend the following policy actions: (i) using a multi-pronged approach to improve household socioeconomic status (ii) commitment towards women's economic and decision-making empowerment (iii) efforts to encourage coverage of health facility delivery should target poor rural women with low educational status (iv) encourage the use of mass media among women, and using media as vehicles for passing health information to women.

Acknowledgments

The author is grateful to MEASURE DHS for access to the data set used for the analysis in this study.

Competing interests

The authors declare no competing interest.

Funding

There are no financial support.

Availability of data

The data analyzed in this study is available on the DHS website at https://www.dhsprogram.com/data/.

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