A RISK ADJUSTED CAPITATION REGIME FOR COMMUNITY BASED SOCIAL HEALTH INSURANCE PROGRAMME

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Abstract: *The general poor state of the Nigeria's healthcare services informed the need for establishment of the National Health Insurance Scheme (NHIS). Health care providers reimbursing systems under the scheme includes among others reimbursement method, capitation and fee-for-service with capitation specifically being used under Community Based Social Health Insurance Programme (CBSHIP). This study applies a risk adjustment model on managed care organizations with the goal of attaining a fair and adequate reimbursement. The risk-based reimbursements reflect cost differences attributable to the enrolees. Using enrolees data of 23,375 individuals, results show that a sum of N528, 546.52 ($1,679.26) will be saved by the scheme and cream-skimming of members by health status and plans due to morbidity risk will be neutralized.*

Keywords: *Capitation, Risk-adjustment, Primary-care, NHIS, CBSHIP*

1. Introduction

Healthcare indicators in Nigeria have either decayed or deteriorated during the past decade despite the government's struggles to improve healthcare delivery (Gustafsson-Wright and Schellekens, 2013). Generally, Nigeria's healthcare services are in poor state due to disproportionate reliance and stress on government to provide healthcare amenities, declining budget for healthcare under continuous inflationary economy, unorganized private health sector and overreliance on out-of-pocket to purchase healthcare services which informed the need for the establishment of the National Health Insurance Scheme (NHIS) (Olanrewaju, 2011; Ibiwoye & Adeleke, 2007; Ojikutu, Yusuf, Obalola, Adeleke, Ajijola & Mesike, 2012). However, the NHIS is still struggling to achieve its' mandate of ensuring universal health coverage for all Nigerians with large percentage of the population relying on out-of-pocket expenses that include over-the-counter payments for medicines and fees for consultations and procedures (WHO, 2010; Odeyemi, 2014). In order to overcome these challenges, NHIS introduce amongst other programmes a risk-pooling prepayment system called Community Based Social Health Insurance Programme (CBSHIP). The new programme is expected to significantly lead to improvement in the operation of the scheme and enhance the quality of service delivered to the enrollees (NHIS, 2012).

Community based health insurance programme is a non-profit form of health insurance that has been used by underprivileged people in order to access affordable healthcare services for illness (Uzochukwu, Onwujekwe, Eze, Ezuma, Obikeze & Onoka, 2010). The emergence of CBSHIPs was due to inability of regular health insurance and microcredit programmes in guaranteeing affordable health services to the low-income and vulnerable population (Tundui & Macha, 2014). Households enrolled in the scheme pay a prescribed amount or premium or other agreed non-monetary payments into a collective fund on a regular basis in order to access health services whenever the need arises (WHO, 2005; Carrin, Waelkens & Criel, 2005). Health care providers reimbursing systems under the scheme includes among others healthcare reimbursement methods, capitation and fee-for-service with capitation specifically being used to cover primary care healthcare facilities under the CBSHIP (NHIS, 2005, NHIS, 2012). However, capitation method of reimbursement has generated a lot of criticism (Mohammed, Souares, Bermejo, Sauerborn, & Dong, 2014; NHIS, 2008; Ukandu, 2013). While hospitals and clinics with lesser enrolees have frequently protested of insufficiency of the capitation fee being paid on the enrolees, other health workers like pharmacists and laboratory scientists, maintain that they should be paid a commensurate capitation fees directly rather than receiving payments from hospitals and clinics under primary healthcare services in CBSHIP (Ukandu, 2013). In order to stem these disagreements among these healthcare providers in Nigeria, there is need to introduce a risk adjusted capitation payments by NHIS. A risk adjusted capitation payments assist healthcare providers to mirror rate dissimilarities attributable to their enrolees' health conditions (Rice & Smith, 2001; Centers for Medicare & Medicaid Services, 2003). Risk adjustment capitation payment with appropriate risk scoring procedures will also ensure to defuse inducements for selection of enrolees by healthcare plans that are cantered on ill health risk of the enrolees (Mehmud &Yi, 2012). Given the problem of under-provision of services within the risk group, for which a particular flat-rate capitation amount is applicable, it is pertinent to answer the question "*what is the effect of risk adjustment on capitation payment system in a CBSHIP"*? Hence this study proposes an adjusted capitation payment to healthcare facilities (hospitals and clinics) to mirror rate dissimilarities attributable to their enrolees' health conditions in a CBSHIP.

The remainder of this article is organized as follows: Section 2 presents a review of literatures in the area of capitation, community based health insurance and health-based risk adjustment model, Section 3 discusses the methodology employed in the study while results and discussion of findings and conclusion are presented in Section 4.

2. LITERATURE REVIEW

Social health insurance system under the NHIS is confronted with problem of establishing risk-related premiums for groups of enrolees who share similar morbidity risk profile, called an "actuarial category". The risk connected with the incidence of ill-health is a major challenge in placing these enrolees in an associated premium. (Holly, Gardiol, Eggli, Yalcin & Ribeiro, 2003; Holly, Gardiol, Domenighetti, & Bisig, 1998). Unlike conventional health insurance where risk rating is allowed, social health insurance must receive without any reservations applicants with different morbidity risks, demographics and socio-economics background and charge the same premium known as "community-rated" premium (NHIS, 2012). Nevertheless, unravelling the healthcare inequality through a grouped premium spurs the NHIS funds to perform "risk selection", or "cream skimming". In addition, though the development of medical insurance has fortified functions of clinicians in primary care facilities, they are gradually accepting financial and health risks for patients who are enrolled under capitation payment (Fowles *et al*., 1996; Hurley *et al*. 1999; Vanselow, 1998). Since illness is not randomly distributed among the populace, acceptable risk-adjustment procedures are required to neutralize the fundamental dissimilarities in physician practices (Starfield, 1998).

Capitation is a payment in advance to a managed care organizations to reflect anticipated services to be provided by the hospitals or clinics to an insured enrollees that is registered with such managed care organizations irrespective that the insured access the services or not (NHIS, 2012). Rice & Smith (1999) also defines capitation as an amount from health service funds assigned to a person for the service in rendered by managed care, during the period under review, but predicated on budget constraints. Basically, capitation arrangement will charge reflective price that is varied according to an individual's personal and social characteristics, using a process known as risk adjustment on every citizen (Hauck, Shaw & Smith, 2005). A risk-adjusted capitation payment is intended to be an unbiased estimate of the expected costs of the citizen under health care plan over the chosen time period (usually one year) in many countries. Capitation is also perceived as a significant payment system for fortifying both equity and efficiency objectives, but faced with utilization, technical, insurance and performance risk (Spector, Studebaker & Menges, 2015). While “utilization” risk occurred when providers’ revenue rises with declining utilization and drops with growing utilization, “technical” risk occurred when healthcare providers collect single fee for all of the services provided. A situation where costs of treating an enrollee is higher than the capitation rate is the “insurance” risk, “performance” risk on the other hand is a situation where healthcare provider assumed financial responsibility for all of the care that the patient receives (Rosenthal & Frank, 2006).

According to Rosenblatt *et al*, (1993) equitable matching of financial reimbursement with financial liability within an insurance system is a key goal of the risk adjustment process. NHIS, (2012) also provide that Primary Health care facilities will be reimburse by capitation in order to ensure simplicity and cost containment and actuarial analysis. These procedures will be carried out from time to time in order to determine appropriate rate to the Health Care Providers. Adjustment of capitation fees is also a risk adjustment procedure designed to mirror healthcare providers cost differences attributable to enrollees’ health conditions, hence, application of risk-adjustment methodologies is particularly relevant to primary care (Rosen, Reid, Broemeling & Rakovski, 2003; Rice & Smith, 2001; Centers for Medicare & Medicaid Services, 2003).

3. Material and Methods

3.1. Data

The study used claims and enrollment information for Community Based Social Health Insurance Scheme (CBSHIP) in Lagos State. The enrollees received healthcare services from fifteen (15) healthcare facilities. The HMO paid the healthcare facilities a monthly capitation rate of six hundred naira (N600:00) on all the 23,375 enrollees. Of the 23,375 enrollees in the scheme 15,666 made claims in the base period (April 1 to June 30, 2012) while 11,093 made claims in the prediction period (July 1 to September 30, 2012). The claims data is stated after discounts provision to the healthcare provider but member cost sharing deduction is made in advance. The data allows up to 499 diagnoses per inpatient admission and outpatient claim and all the reported diagnoses are used for this study. Categories of claims that included an important frequency and severity of claims were reviewed with the data of enrollees who neither make pharmacy nor medical claims. These data was used to predict the expected claims and risk score include all 15,666 members who made claim(s) in the base period (April, May and June). International Classification of Primary Care (ICPC) codes were used to group diagnoses reported.

3.2. Design

In order to develop and test the risk weights attributable to the enrollees’ morbidity risks a split design was used in this study. Enrollees were divided and randomly assigned to calibration/base and validation/prediction data subsets. This design will neutralize over-fitting the data, which could embellish other measures of predictive accuracy especially the goodness of the fit (Cumming *et al*. 2002). The subsequent multivariate linear regression model was further applied to each of the facilities (“Cat” specifies the demographics (age/gender) or diagnoses condition category(s) apportioned to an enrollee):

$$Y_{Actual} - Y_{Prediction} = \sum_{i=1}^{A} \alpha_i \times AgeCat_i + \sum_{i=1}^{B} \beta_i \times ConditionCat_i \qquad (1)$$

Where

Y_{Actual} = Total actual allowed claims

$Y_{Prediction}$ = Total predicted allowed claims

α_i = Regression coefficient specifying adjustments to the age categories risk prediction

β_i = Regression coefficient specifying adjustments to the ICPC diagnoses condition categories risk prediction.

3.3. Method

Healthcare risk assessment based on claims is the procedure of defining the comparative expenses of an individual based on his morbidity account (Mehmud &Yi, 2012). A characteristic procedure is to assemble the disease categories and drug prescription history of an enrollee into homogenous diagnoses groups. Individual enrollees risk scores were calculated by additive regression model for each member in the homogenous group(s). For this study, the regression model applied is:

$$Y_{Base} = \alpha + \sum_{j} \beta_j X_j \qquad (2)$$

$$Y_{Prediction} = \alpha + \sum_{k} \beta_k X_k \qquad (3)$$

While equation 2 is for concurrent model, equation 3 is for prospective model. In each of equation 2 and 3, α indicates the intercept of the linear regression while each beta (β) represents the coefficient of the regression summed over demographics and ICPC diagnoses group binary indicators. The dependent variable, Y is the total claim amount over the base and prediction period. For this study, IBM SPSS 20 was used to carry out stepwise regression analyses on the base period (April, May and June) total claims amount, age/gender and diagnoses information in order to determine the individual enrollee's risk score and relative risk score for concurrent risk assessment. For prospective risk assessment, total claims amount in the prediction period (July, August and September) is the dependent variable while age/gender and diagnosis information in the base period is the independent variable.

3.4. Computation of the Risk Score and the Risk Adjusted Capitation Rate

In order to compute the enrollees risk score, the study selected the time period for the risk assignment, appropriate data source and the beneficiaries that will be risk adjusted. The study assummed that these distributions of health risk among the enrollees reflects similar distributions in the operative period for the rates, because regularization of risk depends on this normalization. However, this procedure shows one of the uncertainties in the practice of risk adjustment as the overall risk which is normalized to 1.00 may not remain at constant rates during the period under review. Non eligibility of some enrollees to be assigned a risk score in the base period is another practical limitation concerning the morbidity risks of members. The procedure on how risk score computations was used to adjust revenue to healthcare facilities was explained in this section. For the purpose of preparing the data for risk assignment, the predicted claims from equation 2 and 3 was applied to assign risk score to each enrollees and construct a databank containing the demographics and diagnoses information of the enrollees. For this study, the equation (4) below was used to compute the individual enrollees and the facilities risk score:

$$Risk\ Score_i = \frac{RR_i \times (\sum D_i + ICPC_i)}{\sum d_i + ICPC_i^*} \tag{4}$$

where

RR_i =*Relative Risk Score of Individual Healthcare Facilities*

$\sum d_i + ICPC_i^*$ =*Sum of Demographics and ICPC Diagnoses indicators in a Facility*

$\sum D_i + ICPC_i$ =*Total sum of Demographics and ICPC Diagnoses indicators in all the Facilities*

The relative risk score is the ratio of individual facilities predicted claims to overall predicted claims while i represent the healthcare facilities. For example, if the predicted claims in a scheme that consist of five (5) healthcare facilities is ₦10,000,000 and the sum of all enrollees demographics and ICPC diagnoses binary indicators ($\sum D_i + ICPC_i$) is 25, 099. In addition, if a particular facility predicted claim is ₦15,000 and the sum of enrollees demographics and ICPC diagnoses binary indicators ($\sum d_i + ICPC_i^*$) for that facility is 31. Then the relative risk score (RR_i) of that facility will be $\frac{15000}{10000000} = 0.0015$and the risk score will be $\frac{0.0015\times25099}{31} =$ 1.2. In this example, a risk score of 1.2 means that the facility is expected to incur future claims that are 20% higher than the future claims of the average of all other participating healthcare facilities in the scheme.

4. Results and Findings

4.1. Applications of the ICPC Risk Adjustment Model to adjust Capitation Reimbursement

The prior sections explained the assessment and scenario analysis of risk assessment and risk adjustment. This section shows how the computed risk was applied to risk adjust revenue to healthcare facilities. For this study, there are fifteen healthcare facilities with varying number of enrollees and claim amounts. There is an overall capitation rate of ₦600.00 for this community health insurance plan that is varied by population type, demographics, region, etc. Table 1 (column 3) shows the distribution of all 23,735 enrollees into the fifteen facilities. Homogenous distribution assumption of all these enrollees was made in order to normalize the risk during the period. This assumption is one of the challenges confronting the implementation of risk adjustment because total normalized risk might not be at constant rates during the period under review. In addition morbidity risks of enrollees are another challenge posed by this assumption because some enrollees might not have sufficient eligibility to qualify for risk score assignment in the base period. The required standard for an individual to have sufficient eligibility for risk score assignment is six months or more (Mehmud & Yi, 2012). Furthermore, calculated risk score can be subjective due partial eligibility of some enrollees. Health actuaries as well as other healthcare practitioners have different approaches to solve this challenge of enrollees' partial eligibility. Assignment of demographic (age/gender) risk score computed over the entire population or combination of a demographic (age/gender) risk score with the risk score assigned enrollees in the same scheme could be used. For this study relative morbidity risk of enrollees by facility was used to adjust the capitation rate of ₦600.00.

The adjustment neutralized the budget because risk scores is normalize to 1.00 and money is moved from one facility to the other. Equation 4 above was applied to predicted claims in table 1 to determine the individual facilities risk score. Table 1 also shows the applications of risk score to compute base period risk adjusted capitation rate. The table answered our research question (*what is the effect of risk adjustment on capitation payment system in a CBSHIP?*) and confirms the results in Table 1 and Table 2 by showing that facility 12 should be paid ₦876.36 adjusted monthly capitation compare ₦600.00 being currently paid to the facility.This is justifiable given the counts of risk indicators and other characteristics (age/gender and ICPC diagnoses indicators) of the enrollees in facility 12 enrollees compare to other facilities in the scheme. Facilities 6, 9 and 14 adjusted monthly capitations are also above ₦600.00 while the remaining eleven facilities adjusted monthly capitations are below ₦600.00.

Table 1: Applications of the Risk Score to Compute Base Period Risk Adjusted Capitation Rate

Providers	Predicted Claims (N)	Relative Risk Score	Counts of Risk Indicators	Risk Score	Capitation Rate	Adjusted Cap Rate
Facility 1	33,254.89	0.0001757	8	0.86	600	513.34
Facility 2	1,0119,871.80	0.0534768	2,416	0.86	600	517.27
Facility 3	517,006.11	0.002732	120	0.89	600	532.05
Facility 4	72,718,699.76	0.3842701	16,142	0.93	600	556.33
Facility 5	3,107,705.17	0.0164222	722	0.89	600	531.55
Facility 6	792,570.81	0.0041882	155	1.05	600	631.46
Facility 7	681,246.54	0.0035999	175	0.80	600	480.74
Facility 8	35,498,255.03	0.1875848	7,464	0.98	600	587.32
Facility 9	2,703,697.32	0.0142872	468	1.19	600	713.43
Facility 10	22,130,568.98	0.1169454	4,657	0.98	600	586.85
Facility 11	17,765,564.03	0.0938792	3,951	0.93	600	555.28
Facility 12	745,129.70	0.0039375	105	1.46	600	876.36
Facility 13	22,604,762.40	0.1194512	4,408	1.06	600	633.29
Facility 14	498,313.61	0.0026333	82	1.25	600	750.47
Facility 15	545,084.84	0.0028804	126	0.89	600	534.24
Total/Average	**189,238,490.62**	**1.00**	**40999**	**1.00**	**600**	**600.00**

Table 2: Applications of the Risk Adjusted Capitation Rate to Compute Base Period Risk Adjustment

Providers	Capitation Rate	Adjusted Cap Rate	Total Number Enrollees	Unadjusted Quarterly Capitations	Adjusted Quarterly Capitations	Risk Adjustment
Facility 1	600	513.34	12	21,600.00	18,480.35	(3,119.65)
Facility 2	600	517.27	1,193	2,147,400.00	1,851,321.46	(296,078.54)
Facility 3	600	532.05	139	250,200.00	221,866.91	(28,333.09)
Facility 4	600	556.33	7,812	14,061,600.00	13,038,100.01	(1,023,499.99)
Facility 5	600	531.55	603	1,086,195.73	962,280.11	(123,915.62)
Facility 6	600	631.46	636	1,144,800.00	1,204,832.85	60,032.85
Facility 7	600	480.74	137	246,600.00	197,583.26	(49,016.74)
Facility 8	600	587.32	4,915	8,847,000.00	8,660,086.06	(186,913.94)
Facility 9	600	713.43	537	966,600.00	1,149,343.42	182,743.42
Facility 10	600	586.85	2,423	4,361,400.00	4,265,825.32	(95,574.68)
Facility 11	600	555.28	2,143	3,857,400.00	3,569,911.52	(287,488.48)
Facility 12	600	876.36	100	180,000.00	262,909.26	82,909.26
Facility 13	600	633.29	206	370,800.00	391,371.23	20,571.23
Facility 14	600	750.47	2,755	4,959,000.00	6,202,600.53	1,243,600.53
Facility 15	600	534.24	124	223,200.00	198,736.92	(24,463.08)
Total/Average	**600**	**600.00**	**23,735**	**42,723,795.73**	**42,195,249.21**	**(528,546.52)**

Table 2 shows the applications of the risk adjusted capitation rate to compute base period risk adjustment. The applications of ICPC risk adjustment model develop in this study shows that additional ₦60,032.85, ₦182,743.45, ₦82,909.26, ₦20,571.23 and ₦1,243,600.53 to facilities 6, 9, 12, 13 and 14 respectively based on the characteristics (age/gender and ICPC diagnoses indicators) of the enrollees in these facilities compare to other ten (10) facilities. Table 6 also shows that Government will be saving ₦528,546.52 if the ICPC risk adjustment model is applied for the payment of capitations to the healthcare facilities.

5. Conclusion

The possibility of Nigeria achieving the primary health care (PHC) goals of universal healthcare and accessible healthcare for all in the next decade seems unrealistic (Abdulraheem, Olapipo & Amodu, 2011). Incessant strikes by Nigeria Medical Association (NMA) and Joint Health Sector Unions (JOHESU) persist in the sector. As at April 2018, JOHESU members are on strike in Nigeria. Determined to change these narratives on the Nigeria health sector, different policies and programmes are being develop by the Federal Government through the NHIS designed to ensure that a greater number of Nigerians including the rural poor have access to quality health care. One of such health programmes is the Community Based Health Insurance Programme (CBHIP). In order to ensure efficiency of the designed programmes, diverse set of health plans, hospitals, clinics, physicians, laboratories, pharmacies and other types of health care providers must be reimburse appropriately (Pedraza, 2011). NHIS operational guidelines (2012) provide that Primary Health care facilities will be reimburse by capitation in order to ensure simplicity and cost containment. However, a capitation arrangement is faced with utilization, technical, insurance and performance risk (Spector, Studebaker & Menges, 2015). In view of the above problems, the importance of quantitative healthcare analyst cannot be over- emphasized, hence the need to investigate the effects of risk adjustment on capitation payment system in a Community Based Social Health Insurance Programme (CBSHIP).

In this study, demographic, hospitalization and International Classification of Primary Care (ICPC) diagnoses risk adjustment model was applied to carry out scenario analysis on all the fifteen healthcare facilities used in this study. The model was also applied to adjust capitation payments to healthcare facilities based on the risk characteristics of their enrollees. The results shows that though the higher the number of enrollees in a healthcare scheme the better the predictive performance of claims, the health status of the enrollees is a more better indicator of predictive performance as seen in Facility 12 that treated only 45 enrollees with 99 acute and 28 chronic related conditions. The degree to which a risk adjustment models reduce health insurance funds' motivations to select good risks is the most important benchmark for evaluating it (Van de Ven & Ellis, 2000). The results above show that the risk adjusted capitation model developed in this study will adequately reimburse participating healthcare facilities based on the risks they assumed. Since the risk adjustment payments were computed according to medical risk category of the enrollees, the results show that the impact of demographics like age will be considerably reduced and reimbursement of facilities with less inpatient enrollees will be improve. Finally, the results also show that the risk adjusted capitation model will significantly reduce the incentive of adverse selection and cream-skimming by the healthcare facilities. The results also reveal that risk adjusted capitation payment in primary care is a much better payment systems in healthcare.

REFERENCES

Abdulraheem, I. S., Olapipo, A. R. and Amodu, M. O. (2012). *Primary Health Care Services in Nigeria: Critical Issues and Strategies for Enhancing the use by the Rural Communities.* Journal of Public Health and Epidemiology, Vol. 4(1), pp. 5-13, January 2012 Available online at http://www.academicjournals.org/JPHE . DOI: 10.5897/JPHE11.133, ISSN 2141-2316 ©2012 Academic Journals

Carrin, G., Waelkens, M.P. and Criel, B. (2005). *Community-Based Health Insurance in Developing Countries: A Study of its Contribution to the Performance of Health Financing Systems*, Tropical Medicine and International Health 10 (8) (2005) 799-811.

Centers for Medicare and Medicaid Services, (2003). *A Guide to Implementing a Health-Based Risk-Adjusted Payment System for Medicaid Managed Care Programs.* www.hilltopinstitute.org [Accessed 2013, April 16].

Cumming, R.B., Knutson D., Brian A. Cameron, B.A. and Derrick, B. (2002): *A Comparative Analysis of Claims-based Methods of Health Risk Assessment for Commercial Populations.* Society of Actuaries; Milliman USA, Inc., Minneapolis; Park Nicollet Institute Health Research Center.

Donfouet, H. P. P. and Mahieu, P. A. (2012). *Community-Based Health Insurance and Social Capital: A review*. Health Economics Review, 2, 5.

Ekman, B. (2004). *Community-Based Health Insurance in Low-Income Countries: A Systematic Review of the Evidence*, Health Policy and Planning 19 (5) (2004) 249-270.

Fowles, J., Weiner. J.P., Knutson, D., Fowler. E. and Tucker, A.M. (1996). T*aking Health Status into Account when Setting Capitation Rates: A Comparison of Risk Adjustment Methods.* JAMA 1996;276:1316–1321. [PubMed]

Gustafsson-Wright, E. & Schellekens, O. (2013).*Achieving Universal Health Coverage in Nigeria One State at a Time a Public-Private Partnership Community-Based Health Insurance Model*, Brooke Shearer Working Paper Series, Working Paper 2 | June, 2013

Hauck, K. D., Shaw, R., & Smith, P. C. (2005). *Formula funding of health purchasers: Towards a fairer distribution?* In P. C. Smith, L. Ginnelly, & M. Sculpher (Eds.), Health policy and economics: Opportunities and challenges (1 ed., pp. 199 - 222). UK: Open University Press.

Hileman, G.R.(2012).*Risk Adjustment including Implementation*. R's and Predictive Modeling Boot Camp Nov. 8- 9, 2012. https://www.soa.org/files/pd/2012-vegas-3rs-predict-hileman.pdf [Accessed 2016, January 14].

Holly, A., Gardiol, L., Eggli, Y., Yalcin, T. & Ribeiro, T. (2003).*Health-Based Risk Adjustment in Switzerland: An Exploration Using Medical Information from Prior Hospitalisation*. November 2003, Research financed by the Swiss National Fund, National Research Program 45 "Future Problems of the Welfare State" Grant No. 4045-059720/1

Holly A, Gardiol L., Domenighetti G. & Bisig B. (1998). *An Econometric Model of Health Care Utilization and Health Insurance in Switzerland*, in Papers and Proceedings of the Twelfth Annual Congress of the European Economic Association, edited by Philippe Jehiel, European Economic Review, 42: 513-522.

Hurley, J., Hutchison, B., Giacomini, M., Birch, S., Dorland, J., Reid, R. & Pizzoferrato, G. (1999).*Policy Considerations in Implementing Capitation for Integrated Health Systems*. Ottawa ON: Canadian Health Services Research Foundation; 1999.

Ibiwoye, A. & Adeleke I.(2007). *The Impact of Health Insurance on Health Care Provision in Developing Countries.* Ghana Journal of Development Studies Vol. 4 (21) 2007: pp. 49-58

Mehmud, S.M. & Yi, R. (2012). *Uncertainty in Risk Adjustment*; Sponsored by Society of Actuaries' Health Section, © 2012 Society of Actuaries, All Rights Reserved

Mohammed, S., Souares, A., Bermejo, J.L., Sauerborn, R. & Dong, H., (2014). *Performance evaluation of a health insurance in Nigeria using optimal resource use: health care providers' perspectives.* BMC Health Services Research 2014, 14:127 http://www.biomedcentral.com/1472-6963/14/127

National Health Insurance Scheme Operational Guidelines, (2005). National Health Insurance Scheme, ISBN 9782397245

National Health Insurance Scheme, (2008). *Strategic Plan of Operations 2008–2010*. Abuja, Nigeria: NHIS; 2008.

National Health Insurance Scheme Operational Guidelines Revised, (2012). National Health Insurance Scheme, ISBN 9782397245

Odeyemi, I. A. (2014). *Community-Based Health Insurance Programmes and the National Health Insurance Scheme of Nigeria: Challenges to Uptake and Integration*. International Journal for Equity in Health, 13(20), 1 - 13.

Ojikutu, R.K., Yusuf, T.O., Obalola, M.A., Adeleke, I.A., Ajijola L.A. & Mesike, G.C. (2012). *Health Insurance Demand and Access in Lagos State Nigeria*; Business and Social Sciences Review (BSSR) Vol.1, No.7-8, (Jan-Feb, 2012) www.bssreview.org ISSN: 2047-6485

Olanrewaju, T. (2011): *National Health Insurance Scheme: Of What Benefit to Nigerian Masses?* Nigerian Tribune Monday, November 21, 2011. Retrieved from www.nigeriantribune.com on November 16, 2014

Pedraza C.C. (2011). *Diagnoses-Based Risk Adjusted Capitation Payment for improving Solidarity and Efficiency in the Chilean Health Care System:Evaluation and Comparison with Demographic Model (Doctoral dissertation).* University of Duisburg-Essen retrieved from d-nb.info/1015361889/34

Rice, N. and Smith, P. (1999). *Approaches to Capitation and Risk Adjustment in Health Care: An International Survey*. York, England: Centre for Health Economics, University of York.

Rice N. and Smith P.C. (2001). *Capitation and Risk Adjustment in Health Care Financing: An International Progress Report.*The Milbank Quarterly, Volume 79, Issue 1, pages 81–113, March 2001 DOI: 10.1111/1468-0009.00197.

Rosenthal, M.B. and Frank, R.G. (2006). *What Is the Empirical Basis for Paying for Quality in Health Care?* Medical Care Research and Review 63(2): 135–157.

Rosenblatt, A., Bertko, J., Bowen, B., Crocker, N., Hammond, A., Helwig, D.,...and Sandler, G. (1993).*Health Risk Assessment and Health Risk Adjustment - Crucial Elements in Effective Health Care Reform.* American Academy of Actuaries, Monograph Series on Healthcare Reform, Monograph Number One, May 1993.

Rosen, A.K., Reid, R., Broemeling, A. and Rakovski, C.C. (2003). *Applying a Risk-Adjustment Framework to Primary Care: Can We Improve on Existing Measures?* Annal of Family Medicine, Retrived from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1466561/

Spector, J. M., Studebaker, B. and Menges, E. J. (2015). *Provider Payment Arrangements, Provider Risk, and Their Relationship with the Cost of Health Care.* Milliman, Copyright ©2015 All rights reserved by the Society of Actuaries

Starfield B. (1998). *Primary Care: Balancing Health Needs, Services, and Technology*. New York, NY: Oxford University Press; 1998.

Tundui, C. and Macha, R. (2014).*Social Capital and Willingness to Pay for Community Based Health Insurance: Empirical Evidence from Rural Tanzania*, Journal of Finance and Economics Volume 2, Issue 4 (2014), 50-67 ISSN 2291-4951 E-ISSN 2291-496X Published by Science and Education Centre of North America ~ 50 ~

Ukandu, C. (2013). *Is the Provider Reimbursement Mechanism under the NHIS Adequate?* http://www.pharmanewsonline.com/is-the-provider-reimbursement-mechanism-under-the-nhis-adequate-by-dr-chidi-ukandu/ (Retrieved on 3/4/2017)

Uzochukwu, B.S.C., Onwujekwe, O.E., Eze, S., Ezuma, N. Obikeze, E.N. and Onoka, C.A. (2010*). Implementing Community Based Health Insurance in Anambra State, Nigeria,* CREHS Policy Brief, February, 2012. www.crehs.lshtm.ac.uk

van de Ven, W. P. M. M. and Ellis. R. P. (2000). *Risk Adjustment in Competitive Health Plan Markets.* A. J. Culyer, J. P. Newhouse, eds. Handbook in Health Economics. Elsevier, Amsterdam, 756–845.

Vanselow, N.A. (1998): *Better Care and Better Outcomes: The Continuing Challenge*. JAMA 1998;279:1392–1395. [PubMed]

World Health Organization, (2005). *Achieving Universal Coverage: Development of Health Finance Systems*. WHO department of Health Systems Financing, Health Finance Policy. 2005;Vol. 1:4.

World Health Organization, (2010). *Health Systems Financing: The Path to Universal Coverage*. Geneva, 2010.