Influence of Biomedical Sciences on National Health Insurance Scheme in Ghana.

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SUMMARY

Health insurance becomes a viable alternative for financing health care amidst the high cost of health care. This study, conducted in 1997, uses a valuation method to assess the willingness of individuals from the working sector in Accra, Ghana, to join and pay premium for a proposed National Health Insurance Scheme (NHIS). Over 97% of the respondents agreed to join the scheme and 62.8% were willing to contribute 2% of their income as premium. Respondents were mostly aged 30 – 50 years and 68% in the formal sector with 77% having monthly incomes ranging from ¢100,000 to ¢500,000 ($1=¢2,400). Only 23.6% had their health care expenditure financed by their employers. Most, 83%, indicated they visited hospitals more regularly than laboratories and a 14.5% of the irregular hospital visitors admitted spending over ¢100,000 per year on self-medication. Respondents revealed they spent on the average ¢100,000 and ¢50,000 per year for hospital and laboratory services respectively. The estimated individual health expenditure by biomedical methods was nearly ¢10,000 per month. Estimating individual health expenditure is necessary to set meaningful premiums and biomedical science as laboratory services provided could be a useful tool for such a purpose.

[Afr. J. Health Sci. 2002; 9: 51-60]

Introduction

Cost of health care was free in most African countries before 1960 but was restricted to a privileged few who were formally employed or lived in urban towns and cities where hospital services were available. A policy of cost sharing was suggested when the deteriorating health care services, as a result of inadequate financing, was being worsened by rapid increases in population growth. In Ghana for example, a 12% growth in expenditure of the Ministry of Health (MOH) resulted in only 2.3% real per capita increase, consequently user charges were introduced in government health facilities to raise revenue and prevent frivolous use of drugs [1]. A full cost recovery for drugs under a cash and carry policy was initiated in 1992, but the MOH could not raise its revenue target of 15 %, and the cost recovery caused behavioral changes in patients. These changes include delay in reporting sickness to health care providers, consultation at drug stores, partial purchase of prescribed drugs and sharing of drugs with neighbors [2, 3].

Health expenditure will not decline hence alternatives to health financing such as health insurance that spreads risk evenly among policyholders has been identified for Africa [4, 5]. Health insurance could diffuse the cost of ill-health of one individual among many which may be too heavy to bear alone, and could cover the hospital expenses of those experiencing catastrophic events such as near fatal illness or injury [6, 7]. Health insurance could be private or national. Private schemes are generally voluntary and premiums are determined by individual risk assessment. National schemes are usually compulsory for segments or whole communities, government or community sponsored, and are not profit oriented but aims at breaking-even or avoid losses and benefit package is uniform for all [8]. In sub-Saharan Africa,

the little information available indicates that there are no formal health insurance arrangements and when the scheme is present, only low percentages of the population are insured; ranging from 11.4% in Kenya to 0.0001% in Ethiopia in 1997. In Kenya only about 10% of the urban dwellers are insured in a national health insurance fund for those not earning less than Ksh 1000. In Ethiopia a medical insurance coverage provided through employers in urban areas had only 6000 persons benefiting. In Gabon people contribute, based on their ability to pay, 1 to 35 % of their incomes in a social security for treatment abroad [4, 5, 9].

In Ghana, though considerable research and policy analysis on health financing has been done yet not much literature is available, particularly on the premium levels to be paid. Only two studies, both in the eastern region, have suggested premium levels to health insurance. Addo [10] suggested ¢6,000 per month per family of five [11] and Asenso et al. [8] revealed that 63% of people in informal sector were willing to pay ¢5,000 per month for a household of five. None of the studies reported on employed workers in different sectors, formal and informal, in big cities nor has there been a comprehensive study to find the actual cost of diseases frequently treated at health facilities. This study determines whether workers, self- or public employed, in Accra, will join a national health insurance scheme, the premium they are willing to pay, and it estimates the cost of diagnosing and treating a disease by biomedical methods.

Materials and Methods

Study area

The study was conducted in Accra, capital of Ghana, where people with various kinds of employment are found. Residents are workers in both formal and informal sectors, some self-employed with trading and artisan vocations. The study site was selected because residents in Accra and its environs have more access to health care services; Accra has relatively better and larger number of health facilities than other cities or towns. Both quantitative and qualitative research techniques were used in the study [8].

Focus discussion and structure interviews

A total of 243 respondents were encountered during a three month data collection in 1998. Efforts were made to get respondents from within Accra and its surroundings, though no specific systematic sampling method was used. Interviewees were encountered on the premises and precincts of some hospitals and private medical laboratories. However sampling was in part purposively done to get a random sampled size of individuals living in different suburbs of Accra, to reflect respondent-workers socio-economic status (SES) and current levels of health expenditure. Four private medical laboratories in different suburbs of Accra, namely Dansoman, Awudome, Korle Gonno, and Mataheko, were visited to find the exact costs of services provided. The directors and technician/technologists were engaged in discussion and short interviews on issues pertaining to this study and made to respond to structured questionnaire. Visits were made to the MOH to interview a director and staff involved in the NHIS to obtain information about the proposed insurance schemes on plans, organization, management, premiums, enrolment and benefit package among others.

Qualitatively, each respondent or small group was engaged in brief but in-depth discussions and interviews. The technique explored the knowledge and attitude of respondents on the proposed health insurance scheme and educated the 'uninformed' by explaining with brevity the gist of the concept including advantages and disadvantages. The health care financing of respondents and associated problems was determined. Thus respondents were presented with well described but hypothetical situation for them to understand.

Quantitative approach by interviews and structured questionnaire was mainly used to collect data, which was self-administered or administered on behalf of respondents. The respondent's income, age, sex and dependence were also noted.

A detailed description of the services, advantages and disadvantages, associated costs; terms and conditions of benefits offered under the NHIS scheme were explained to the respondents. Those who knew about resource-pooling schemes such as in auto-insurance were given structured questionnaire that allows prediction of his/her socio-economic characteristics and premium to pay. Those who had not heard about such schemes were presented with the maximum price (premium) that they will be prepared to pay for health insurance coverage under the NHIS. A bidding premium of 5% of salaries calculated in exact figures was offered and respondents were asked whether or not they would enroll in the scheme. Those who declined were asked to reconsider a new offer by successively lowering the bid 1% until acceptance was obtained or until the lowest bid of 1% reached.

A contingency evaluation technique was used to assess the individuals' willingness to pay insurance premium but described elsewhere [12, 13, 14].

Hospital/Laboratory visits

Hospital records were examined to determine the frequency of visits per month and the most common illness reported. Of 500 cases selected, the number that were referred to the laboratory was obtained. The different types of tests requested and their frequencies were noted.

Cost of health/laboratory services

The cost of health services per person per month was estimated by frequency of visits at specified contact points in the health facility. The contact point in the health facility was defined as points where patients necessary and regularly visit in hospital when ill. These points did not include necessary but occasional services such as X-ray, surgery, admittance and child birth. The best three contact points were determined and the total cost charged, due to frequency of visits, was converted into ratios for each contact point. Consequently the hospital dispensary, laboratory, and consulting room were visited to obtain charges made. At the dispensary, the cost of treating a particular disease and also the cost of different drugs for treating the same disease were obtained.

Laboratory diagnoses

Patients referred or self-attending laboratories were examined for various tests in haematology, bacteriology, parasitology, virology, and biochemistry. Tests were categorized into three namely simple, medium, and expensive based on various reasons. These include types and numbers of equipment, reagents used, man hours, level of expertise, time duration and extent of calculation applied in the test. All tests were done manually, without automation, to allow estimation of time and complexity for costing purposes. Simple tests involved 1 or 2 equipment, at most 2 reagents and half man hours. A technician performed the test and the result was ready between 5-30 minutes. Medium test required more equipment and 2-5 different reagents and timed one-man hour at most. Simple calculations were involved and results were ready in 1 to 2 hours. A technologist or supervised technician performed the test. An expensive test involved different reagents used in specified procedures with exact calculated amounts at different time points. It was time consuming, cumbersome and required sometimes, sophisticated equipment. An expert such as a specialized technologist performed the test.

Results

Basic Characteristics

Of the 243 respondents interviewed 36 forms were rejected because of (i) falsified answers, (ii) unwillingness to disclose income level, (iii) ignorance, (iv) inability to

understand questions and (v) unemployment. The 207 enlisted respondents were aged between 20-69 years with a 32.8% majority aged 40-49 years. Other age groups were 20-29 had 20.3%, 30-39 had 30.0%, and 50-59 had 13.5%. Only 3.9% of the respondents were above 60 years. The respondents were distributed in employment as 36.2% in formal private, 31.9% each in formal public and informal including artisans.

Hospital and laboratory visits

Most respondents, 83% (163/207), indicated they received regular health care services. Although 16.4% (n=34) of the respondents had irregular visits to hospital, 14.5% (n=30) of them revealed they spent an average of ₡100,000 on self-medication yearly. Respondents who received medical laboratory services were 63.7% (n=163) and of these 34% (n=71) had irregular visits, specifically attending hospital once every other year or more but admitted spending money for treatment when necessary (Tables 1 and 2). More respondents attended hospital more frequently than laboratories. On two instances however, respondents reporting to hospital were less than laboratory: 25 to 27 once every 6 months and 46 to 48 yearly (Tables 1 and 2).

Cost of Medical /Laboratory services

Hospitals and medical laboratories were visited to determine the probable cost of services. Three major contact points at hospitals were identified as consultation, laboratory and dispensary. Services such as X-ray, surgery, and admission were irregular and were administered once in a life time during emergency or never. Based on the number of regular contacts, hospital expenditure was estimated at 2/5 each on drugs (dispensary) and medical laboratory services, and 1/5 on consultation and other services. Medical laboratory services was likely the only health care unit with the same defined procedures, technique and definitive cost followed every where. Costs per test were generally similar with only slight differences existing geographically and environmentally.

Table 1: Frequency of Hospital services and cost per year for respondents.

(a) Frequency of Hospital attendance	Period of regular hospital attendance				Irregular attendance
	Monthly	3 Monthly	6 Monthly	Yearly	
Once	9 (4.35)	21 (10.14)	25 (12.07)	46 (22.22)	34 (16.43)
Twice	1 (0.48)	1 (0.48)	-	41 (19.81)	
Thrice	-	-	-	16 (7.73)	
≥ 4 times	-	-	-	13 (6.28)	
TOTAL	10 (4.83)	22 (10.63)	25 (12.07)	116 (56.04)	34 (16.43)
b) Range of Average costs of Hospital Services received					
₡ 30,000 or below	6 (2.90)	14 (6.76)	12 (5.80)	28 (13.53)	13 (6.28)
₡ 31,000 – ₡ 60,000	3 (1.45)	7 (3.38)	10 (4.83)	36 (17.39)	14 (6.76)
₡ 61,000– ₡100,000	1 (0.48)	1 (0.48)	3 (1.45)	25 (12.07)	3 (1.45)
₡101,000–₡200,000	-	-	-	22 (10.63)	-
Above ₡ 200,000	-	-	-	5 (2.42)	-
TOTAL	10 (4.83)	22 (10.63)	25 (12.07)	116 (56.04)	30 (14.49)

Figures in parenthesis are percentages

Table 2: Frequency of Laboratory services and cost per year for respondents.

a) Frequency of laboratory visits	Period within which regular visits were made				Irregular attendance
	Monthly	3 Months	6 Months	Yearly	
Once	6 (2.90)	12 (5.80)	27 (13.04)	48 (2.3.19)	71 (34.30)
Twice	-	1 (1.08)	-	28 (13.53)	
Thrice	-	-	-	9 (4.35)	
≥ 4 Times	-	-	-	5 (2.42)	
TOTAL	6 (2.90)	13 (6.28)	27 (13.04)	90 (43.48)	71 (34.30)
b) Range of Average costs of med. Lab. Services received					
₵ 10,000 or below	-	5 (2.42)	10 (4.83)	22 (10.63)	17 (8.21)
₵ 11,000 – ₵ 20,000	2 (0.97)	3 (1.45)	10 (4.83)	32 (15.46)	14 (6.76)
₵ 21,000 – ₵ 50,000	2 (0.97)	3 (1.45)	7 (3.38)	24 (11.59)	6 (2.90)
₵ 51,000 – ₵ 100,000	1 (0.48)	2 (0.97)	-	5 (2.42)	-
₵ 101,000 – ₵ 200,000	1 (0.48)	-	-	5 (2.42)	-
TOTAL	6 (2.90)	13 (6028)	27 (13.04)	90 (43.48)	37 (17.87)

Figures in parenthesis are percentages

In the laboratory, different tests were grouped based on cost as simple, medium or expensive. Simple tests, usually routine, such as hemoglobin (Hb), malaria diagnosis, pregnancy (PT) and sickling were up to ₵5,000. Medium cost tests including urine and stool routine examination (R/E) were between ₵6,000-₵10,000, and expensive tests such as Liver function (LFT), high vagina swap were above ₵10,000. Simple and medium cost tests were routinely sought for by people, privately and by doctor's request, compared to expensive tests (data not shown). Malaria test was ₵4,000 and averagely people had a malaria episode per month.

Hospital and Laboratory expenditure

Only 23.67% interviewees had their healthcare financed by employers. Of the 10 respondents attending hospital monthly, 6 spent up to ₵30,000, 3 between ₵31,000-₵61,000, and 1 between ₵61,000-₵100,000, but none above ₵100,000 (Table 1). The 22 respondents attending hospital once every 3 months, 14 spent up to ₵30,000 and the least, 1 spent between ₵61,000-₵100,000. The group of 25 respondents visiting hospital once every 6 monthly, the highest of 12 spent up to ₵30,000 and the least number of 3 between ₵61,000 - ₵100,000. The yearly attendants had more people, 36 spent between ₵31,000-₵61,000 than the 28 respondents who spent up to ₵30,000. Irregular hospital attendants had most, 14 respondents spent between ₵30,000-₵61,000 and the least 3 between ₵61,000-₵100,000 (Table 1).

Expenditure on laboratory services was more variant. For the monthly visitors, 2 each spent between ₵11,000-₵20,000 and ₵21,000-₵50,000, and 1 each ₵51,000-₵100,000 and ₵101,000-₵200,000 (Table 2). Those who had laboratory services every three months, 5 spent up to ₵10,000 and the least 2 spent between ₵51,000-₵100,000. The 6 monthly group had 20 respondents spending up to ₵20,000 and 7 between ₵21,000-₵50,000. The yearly group had more people, 32, spending between ₵11,000- ₵20,000 than 24 between ₵21,000-₵50,000, and 22 up to ₵100,000 (Table 2).

Income and Willingness to pay premium

Monthly earnings of respondents ranged from below ¢100,000 to ¢1,000,000 or more. Most respondents had income between ¢100,000–¢500,000, with the highest of 18.8% earning ¢200,000-¢290,000, 16.4% between ¢300,000-¢390,000, 12.6% between ¢400,000-¢490,000, and the least of 2.4% below ¢100,000 (Table 3). A cumulative total of 97% respondents were willing to pay 1% of their income as insurance premium, 62.8% (n=71) and 17.9% were eager to pay 2% and 5% respectively but 2.9% (n=6) would not pay (Table 4). Those willing to pay 1% of their income, 21 earned between ¢200,000-¢290,000, 15 between ¢300,000-¢390,000,and 1 each earned between ¢700,000-¢790,000 or ¢900,000 and more. Those willing to pay 2%, 14 earned between ¢200,000-¢390,000, 13 each between ¢200,000-¢290,000 and ¢400,000-¢490,000, 1 below ¢100,000, and 6 above ¢1,000,000. Income of respondents were categorized into lower, middle and upper based on rent, utilities (water and electricity), commodities, goods, health and other service expenditure in Accra. The lower income group earned below ¢300,000 and were 34.3% (n=71), the middle income earned between ¢300,000-¢690,000 and had the highest respondents of 43.5% (n=90), and the least of 22.2% (n=46) were in the upper income group of ¢700,000 and above.

Table 3: Respondents' income groups and percentage premiums intended per month for health insurance

Category of income level	No. of respondents who would pay					Total No. of Respondents
	1% of income	2% of income	5% of income	Above 5% of income	Cannot pay at all	
Lower	36	32	6	2	5	71 (34.30)
Middle	30	42	17	-	1	90 (43.48)
Upper	5	29	9	3	-	46 (22.22)
TOTAL	71 (34.30)	93 (44.93)	32 (15.46)	5 (2.42)	6 (2.90)	207 (100%)

Figures in parenthesis are percentages

Table 4: Cumulative distribution of respondents' willingness to pay premium with regard to their income levels.

Willingness/ Ability to pay	Percentages of respondents of the different income groups			
	Lower	Middle	Upper	Combined
Above 5% of income	2.81	-	6.52	2.42
5% of income	11.27	18.89	26.09	17.87
2% of income	42.25	65.56	89.13	62.80
1% of income	92.96	98.89	100	97.10
Cannot pay	7.04	1.11	-	2.90

Discussion

In Accra metropolis most respondents interviewed had not heard about the NHIS scheme but upon education agreed it is a better alternative. About 97.1% of respondents indicated their willingness to join the NHIS scheme and wished its quick implementation. A similar study conducted in the eastern region of Ghana revealed 98.7% of respondents wished the scheme implemented immediately. The demand for a national health insurance is influenced by factors such as high cost of health expenditure, income levels, premium to be paid, and the benefit package [8, 14]. Respondents questioned their benefit package. According to the NHIS Secretariat of MOH, the benefit package included basic /primary health care services, medical laboratory services, prescribed drugs, minor and selected major procedures, and maternity services. These services would be provided on Out–Patient and In-Patient basis. However co-payment will be done on In-patient care from 4 weeks and above, and also visits after six (6) times will attract deductible payments. A visit refers to reporting to a doctor with a new condition lasting for about two week [11]. Extra cost will also be paid for intensive care unit (ICU) services. Respondents were delighted about the package.

Respondents were more in the formal than informal sector, 63% to 31%. More formal workers were encountered in the precincts of hospitals probably because of i) better education to understand the need to report illness at hospitals, ii) employers partly or wholly financing their health care and iii) their economic status such as having regular income. Although informal workers are relatively poor and cannot afford hospital care services, a few were among the upper class and could pay outright the cost of treating an aliment [15]. Except for slightly differences, respondents were evenly distributed in the different income classes; 38% earned ¢200,000 to ¢290,000, 37% between ¢300,000-390,000, 26% and 27% earning between ¢100,000-¢190,000 and above ¢400,000 respectively. This suggests that sickness has no boundaries and affects all income groups. The average Ghanaian earns less than $1 per day, far below the recommended value by international organizations such as the United Nation member bodies. Based on individual expenditure on utilities, rent, health and other services in Accra metropolis, low income was pegged below ¢300,000 and middle income between ¢300,000-¢690,000 [16]. Most Ghanaian workers, is generally perceived, fall within the lower income group and must reflect in randomly selected group of persons and yet the situation is different in this study. Majority, 40%, of the respondents were middle income earners, 34% were lower income earners and the least of 22% were in the upper income class. Probably more middle income earners tend to visit hospitals than the lower group because they can afford the full cost of treating an illness. The few upper income earners encountered suggest that they hardly fall sick frequently since good hygienic and sanitation conditions are practiced.

Premium was set as percentages of incomes in this study unlike other studies where it was fixed [8]. Fixed premiums where subscribers pay the same amount irrespective of incomes earned may promote horizontal equity but will not include those not on pay roll. A fixed premium of ¢10,000/month, for example, may be a burden to low income earners but of no significance to higher income earners. Percentage premium where individuals pay proportions of their incomes is advantageous over fixed premium because it is a good indexation factor against economic fluctuations and general inflationary trend. Percentage premiums ensures vertical equity; thus 2% premium means ¢200,000 earners would contribute ¢4,000 and ¢500,000 earners would pay ¢10,000. Cumulatively 62.8% of respondents were willing to pay 2% of their monthly income as premium, thus individuals earning as low as ¢100,000/month in Accra would pay

₵2,000/month. Generally, more people, 97% cumulative total, indicated their ability to pay 1% of their incomes and only 2.2% showed willingness to pay above 5%. About 40% of respondents earning low income and were willing to pay 5% or more as premium was probably because they are frequently threatened by serious illness which cost more. Asenso Okyere et al [8] revealed that 63% of respondents in rural setting in eastern region agreed to pay a fixed premium of ₵5,000 per household of five people. The rural folks are generally poor and most earn irregular wages but their total annual income may be regular and high enough for health insurance policy, or else the central government and /or district assemblies may help fund the scheme.

Regular hospital attendants, reporting monthly or once every 3 months, indicated they visited the hospitals more than laboratories as expected probably because not all clinically suspected cases are referred for laboratory examination. On two instances though respondents visited laboratories more than hospitals; once every 6 months and yearly; 13% and 23% respondents visited laboratories compared to 12% and 22% reporting to hospital. The seemingly unusual situation may be due to people visiting laboratories, without doctor's requests, for tests such as pregnancy, blood grouping, medical examination among others. Self-medication and consultation at herbalists/drug stores/pharmacy may be another reason for respondents irregularly attending health facilities [2].

Estimating the cost of treating specific diseases reported at hospital was one difficulty encountered by the proponents of the NHIS. Qualitative observation revealed that the sum of all charges at three major contact points at hospital namely consultation, laboratory and dispensary is likely to be the actual cost of clinical plus laboratory diagnosis and treatment of a disease. The cost of clinical diagnosis (consultations) and drugs purchased for the same disease may differ from patient to patient; different antibiotics could be used for the same bacteria infection and malaria could be treated with different drugs like chloroquine, mefloquine, halofanthrine and fansidar. Laboratory services however use similar procedures and the cost is definitive. An inevitable slight cost variation due to area of location may indicate the socio-economic status of the local people. This study is the first in Ghana, where health cost per individual per disease has been determined by biomedical laboratory services delivered. It revealed that most people were laboratory diagnosed for simple and medium cost tests, which are relatively not too expensive. The laboratory cost for malaria diagnosis was ₵3,500, and estimating laboratory services and drugs purchased as 2/5 each of total hospital cost and consultation as 1/5, then the tentative cost of malaria diagnosis and treatment is ₵8,750. Taking malaria as the commonest disease in Ghana, if individuals will suffer one malaria episode per month then an estimated nearly ₵10,000 per month would be spent. This could be 1/10 of incomes of those earning less than ₵100,000 per month per individual and ₵50,000 for a household of five. Health care in Ghana is considered very high as expressed by respondents, 84% and 89% of regular hospital and laboratory attendants indicated they spent respectively ₵100,000 and ₵50,000 or more yearly for services. The ₵150,000/person/year, is nearly as suggested by the MOH [11] that every Ghanaian, supposedly individuals among working class, spend an average of ₵10,000 per month as general medical expenses. This amount is nearly similar as estimated by our biomedical methods.

Certain constraints may hinder the success of a national health insurance scheme. The 2.9% respondents who express disinterest in the scheme probably feared their monies would not be properly accounted for. Financial constraints may also be a factor in unwillingness to join the NHIS since 85% of the disinterested group are lower income earners; 40% earned below ₵100,000. A national health insurance scheme will be accepted if contracted trustworthy officials ensure

efficient management. Furthermore, it is believed that informal self-employed workers cannot join the scheme because they do not have regular income, however their seasonal income over a year may be more than that for formal workers [15]. In Ghana the oldest community-based health insurance scheme was at Nkoranza, a rural area where participants are mostly farmers or self-employed artisan workers. Though the scheme lost in the first year it broke even in the third year [17]. In December, 2001, a Kwahuman Health Insurance scheme managed at the Nkawkaw Catholic Hospital requested ¢20,000 per year per individual for basic hospital services. Currently few private health insurance schemes have been introduced in the country but apparently none has been targeted at the rural folks, farmers, fishermen, fishmongers, or market women. In addition, insurance providers have not done much to find the actual cost of health care. It is noteworthy that health facilities are limited or non-existence in rural settings and some urban workers get re-embursement on health expenditure. Further studies are needed to understand how these limitations could influence premiums.

Conclusion

Majority of the urban workers, self- and public-employed, would pay 2% of their income as premium towards a NHIS if implemented. Respondents believed the type of benefit package would encourage more people to join the scheme. However a knowledge of individual health expenditure per month, or cost of clinical and laboratory diagnosis, and treatment of a common disease per month, could help fix reliable premium. More studies are required to know the health expenditure per individual per month for a sustainable insurance program. Biomedical sciences, laboratory services delivered, could be a useful tool for determining the actual cost of individual health expenditure per period.

Acknowledgements

We thank Professor W.Y.Z. Coker for reading the manuscript.

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Manuscript was received on: 20 February 2002, Accepted for publication on: 29 May 2002