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The Impact of Health Expenditure on the Elderly in Nigeria

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Abstract: This reseaech investigates the effect of the burden of health care expenditure on the elderly adults aged 65 years and above using a growth factor model methodology. The analysis shows that per capital health expenditure of the elderly is higher than the per capita health expenditure of other age group in Nigeria. The results show that for the 5 years considered those in the age group 65 years and above spend the larger share of health expenditure. For government total health expenditure the 65 years and above age group claimed 6.6% in 1998, 8.5% in 1999, 11.5% in 2000, 19.9% in 2001, 17.2% in 2001 and 31.0% in 2002. For households total health expenditure the age group 65 years and above spent 31.0% in 1998, 33.8% in 1999, 39.9% in 2000, 44.9% in 2001 and 52.3% in 2002 and finally from total health expenditure; they spent 44.7% in 1998, 51.2% in 1999, 61.3% in 2000, 73.1% in 2001 and 79.4% in 2002. This puts more pressure on family income and reduces the consumption of other goods. The effect of which is increase in old age related disease and quickens the death rate of the elder. Hence, it was suggested that an adequate social security programme and health insurance be established for the elderly adults to ease the pressure of health expenditure on family income, pensions and transfer earnings.

Key words: Expenditure, earning, health, family income, consumption, adults

INTRODUCTION

Population aging constitutes an important discussion in many countries due to increasing number of elderly in population. The concern over this is partly on the implication of aging for health care expenditures on the elderly and the proportion of national income devoted to elderly care. According to life cycle theory, individuals consume more than what they produce in two periods of time and hence are more vulnerable to poverty at these periods. At young ages children are dependent on their parents while older age groups have few alternatives regarding their source of income because their less productive and in a country where there is no government well established social security programme for the elderly, the elderly have to rely on family transfers or savings (Maliki and Prasetyo, 2006).

The Nigeria total population from the last population census in Nigeria was about 140 million; out of this about 76 million constitute the dependent population which made up of both the children below age 18 and the elder above age 60 years and above (NBS, 2007). This figure shows that about 54% of Nigerian total population is dependent population and the proportion of the elderly population out of this is about 25% and this is expected to increase over the year going by the population transition demographic theory. The 2006 World Health Organization report shows that Nigeria spend about 3.8% of her GDP on health and the total health expenditure per capita in purchasing power parity is about $59 compare to countries like United States, Kenya, Ghana, Benin, United Kingdom and Japan who spent 15.3, 4.6, 5.1, 4.7, 8.2, 8.1% and 6, 719, 67, 76, 61, 2, 815 and $2, 581 of their GDP and total health expenditure per capita in purchasing power parity, respectively. This shows that Nigeria still spent less of their national income on health compare to other developing countries and developed countries. The implication of this is that out of pocket expenditure on health in Nigeria is still high. From 2007 National survey by National Bureau of Statistics about 65.6% of Nigeria households have difficulty in paying for their health care and only 16.7% of this seldom have difficulty in paying for their health care. The above data suggest that despite increasing population of the elders in Nigeria coupled with the high incidence of poverty which made it difficult for >50% of Nigerian households to pay for their health care services, the percentage of GDP spent on health care is still low. This implies that most of elderly care expenditure; elderly health care expenditure inclusive is borne by households and mostly from family income.

Therefore, with no social security programme for the elderly most of the elderly health expenditure will be out

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of family income in the form of transfer or from family saving and from pension. And this however will reduce expenditure on other family consumption and expenses.

This study investigates the incidence of poverty and the effect of the burden of health expenditure on the elderly in Nigeria where social security is not available and public transfers to the elderly are very limited.

Literature review: Health care expenditure burden of the elderly adults has been a major concern of discussion in the literature (Selden and Banthin, 2003; Fukawa, 2007; Maliki and Prasetyo, 2006; Mayhew, 2000). However, this concern has mostly been for the developed countries, no literature up till date has addressed this issue concerning developing countries Nigeria inclusive.

The concern for elderly health care expenditure is as a result of population aging which has overtaken different countries of the world though at different rates (Mayhew, 2000). Aging as suggested by Mayhew (2000) will overtake population growth as the main demographic driver of health expenditure growth therefore, health expenditure will expand rapidly in less developed countries relative to gross domestic product and will reach the level currently observed in more developed countries.

Older people consume more health services on the average than any other age group and on the average their ability to perform daily tasks or any economically productive activities is slowly eroded until they become totally dependent on others for some help among which are residential care and long time in the hospital and this reach a maximum in the period just before death (Seale, 1998). However, while some countries health system confer universal coverage, this does not apply to elderly health care services which continue to be dominated by elderly care services within the family unit and therefore put more pressure on family resources. The implication of this is that more family resources in the form of family income, pensions and transfers will be expended on elderly health care which may greatly reduced family expenditure on other goods and services.

In a study on poverty, health and health access among Indonesian elderly; Maliki and Prasetyo (2006) found out that more affluent elderly have relatively higher proportions of total expenditures used for health and the non-poor elderly have higher demand for public hospital services than the poor and after the implementation of health cards as a health care subsidy in Indonesian, the demand for health care facilities amongst the poor elderly increased. Gruber and Wise (2001) in their analysis of social security systems and elderly support programs in several developed countries using a general framework found out that Japan which appears as the only country with a separate elderly health care system, spends an enormous amount in elderly support. They also found out that some developed countries do not provide special health programs for their elderly but rather, the elderly in these countries have health care benefits that are identical to those for other age groups. Health benefits are received primarily by the elderly and constitute the largest portion of their government benefits, due to their relatively greater demand for such services.

In a study on the changes in financial burden for health care in America, Wagstaff (2006) found out that adults aged 55-64 years were most likely (about 30.6%) to incur total burdens exceeding family income compare to adults aged 18-34 years (about 14.5%). They further found out that adults aged 55-64 years had twice the risk of incurring 10% health care services burden compared with adults aged 34-54 years (16.5 vs. 8.3%). From their study mean out of pocket expenditures on health care services and premiums for those aged 55-64 years were 47 and 16% higher than those aged 35-54 years, respectively. This is as results of the fact that health care expenditures increase with age. A study by Selden and Banthin (2003) indicated that the percentage of elderly adults facing burdens of health care over 20% of disposable income was around 20.9 and 22.9% in 1987 and 1996, respectively. The percentage with burdens above 40% of disposable income was 7.3% in 1987 and 7.9% in 1996 and furthermore high health expenditures burden was more prevalent among elderly adults who were poorer, older, female, higher risk and cover traditional insurance. Their results therefore shows a widespread prevalence of high health care expenditure burdens among elderly adults in the United States.

Several studies also shows that per person expenses are greater among the elderly than the non-elderly (Waldo and Freeman, 1989; Cutler and Meara, 1997; Hitiris and Posnett, 1992). This is true for United States of America and seven other OECD countries for which data are available and a recent study indicates that in the mid 1990s the ratio of per-capita spending in the population 65 aged years and above to per capita spending in population of <65 years, ranged from 2.7-4.8 (Anderson and Hussey, 2000). Recent study in Sri Lanka also suggests that more is spent on the elderly on a per capita basis with a ratio of 2.9 (Ried, 1996) and similar findings for hospital care in Uruguay in the early 1990s are reported in Micklin. Another set of findings has to do with differences in per person health expenditures by age group, among subsets of the elderly. Hitiris and Posnett (1992) estimated that per capita personal health expenditures among the oldest to old (85 years and above) were three times those in the age group 65-74 years and twice those in the age group 75-84 years in the United States (Cutler and Meara, 1999).

Zweifel *et al.* (1999) indicate rising payouts in a sample of elderly members of a sick fund in Switzerland with a 90 years old member costing twice as much to the sick fund as a 65 years old.

There is also evidence that health care expenditure, per capita for the elderly may be increasing at a rate faster than for the non elderly. For instance, the ratio of the per capita expenditures of the elderly to the non-elderly in the United States was 3.0 in 1987 (Hitiris and Posnett, 1992) climbing to 3.9 in the mid 1990s (Anderson and Hussey, 2000). Cutler and Meara (1997) found that over the period 1953-87, annual growth of per-person spending on the elderly was about 8%, significantly higher than the estimated 4.7% annual rate of growth for those aged 1-64 years (Cutler and Meara, 1999) for differential rates of growth of medicare spending per person among the old to old and the young elderly).

In a statistical estimation of trends in health care expenditures for the elderly age 65 and above between 1996 and 2006; Machlin (2009), concluded that health expenditures for the elderly in 2006 adjusted for inflation was higher than 1996. The researcher estimated about $333.3 billion total health care expenses for the elderly in 2006 and found out that in each year over 90% of the elderly had some expenses but the average the average annual expense per person with an expense was about 30% higher in 2006 than 1996 after adjusting for inflation.

This shows that in real term the elderly health expenditures increase over the years and according to Mahal and Berman (2001) this increase may be partly due to increase in the proportion of the elderly.

However, health care for elderly in developing countries is characterized by the absence of health insurance and less emphasis on the elderly in government health programs. In these circumstances, the provision of health care is primarily from private sources such as dis-accumulated savings, sale of assets, available pensions or familial transfers. In most developing countries where extended families are still common, the elderly live under the same roof as their children and familial support remains their main source of funding (Mosley *et al.*, 1993).

In sum, the available evidence from developed countries and a limited set of developing countries indicates not only that health expenditures per person are increasing in age but also that the rates of increase in per capita health spending are greatest for the older groups. The implication of these is that health care expenditure places an enormous burden on the elderly due to high and increasing out of pocket expenditures on health especially in a country where little or no attention is pay to social security programme for the older adults.

MATERIALS AND METHODS

The burden of health care expenditure can be measured either by its share of total household income or its share of total household consumption. Theoretical, expenditures on health care by individuals are directed toward particular goods and services in order to satisfy desires for a more general good. Individual seeks maximum utility or satisfaction in life which is derived from his/her own health and from the consumption of other commodities. The process by which health is built up by investment or lost by depreciation or accident can be described by models of utility maximization under a variety of constraints and suppositions (Grossman, 1982). Grossman model assumes that individuals assess the benefits from outlays that will improve their health and compare the benefits to those derived from expenditures on other goods and services in order to decide on their optimum health state. According to Grossman the stock of health diminishes with age hence age has a significant positive driver of greater health expenditure and a recent study (Okunade *et al.*, 2004) also found proximity to death to have a significant positive effect on health expenditure.

Health care expenditure is high in the first few years of life and increases again in old age with the onset of chronic illness and disability. Increase in age therefore, increase health expenditure and since health care is considered a good; increase in expenditure on health care reduces the expenditure on other goods and by implication consumption of other goods. This may put a greater burden on the elders by reducing their consumption of other goods and claiming a large percentage of family income.

Following international institute for applied systems analysis the researchers use the application of the growth factor model to examine the burden of health care expenditure on the elderly. Estimated health expenditure in time t, H (t) is related to a base period as follows:

$$H(t) = H(0)\, e^{t\,(rp+rv)} \quad (1)$$

Two growth rates were hypothesized, one of which (rp) reflects demographic change (change in total population and change in age structure) and the second of which (rv) calculated as a residual is interpreted as an underlying rate for new technology and the growth in factor costs. If I (t) is the index of population size and structure and rp is the rate of change in this index:

$$rp(t) = \frac{1}{t} \ln I(t) \quad (2)$$

Then, it is easy to confirm that:

$$Rv(t) = \frac{1}{t} \ln \frac{H(t)}{H(0)I(t)} \quad (3)$$

If the demographic index is defined so that I (0) = 1 then, the underlying rate can be written:

$$Rv\ (t) = \frac{1}{t} \ln \frac{H(t)}{H(0)} \quad (4)$$

So, that rv can be interpreted as the rate of growth of total health care expenditure normalize by an index of population size and structure. The underlying rate reflects technological change, changes in per capita utilization, shifts in the care provided and other factors but the demographic rate combines population trends and aging and it capture the health needs of a growing population and the costs of treating an older population. These assumptions mean for example that even if the underlying rate of change were zero, health care expenditure would continue to grow (or fall) depending on changes in population size and age structure but if the underlying rate were to fall the GDP share of health could still increase depending on the direction of population change.

As the index of population-related growth in health expenditure the researchers define:

$$I\ (t) = \frac{\sum Pi(t)ci(t)}{\sum Pi(0)ci(0)} \quad (5)$$

Where:

Pi (t) = Population in age group i
ci (t) = The age-specific relative expenditure index

Note that I (0) = 1. It is possible to decompose I (t) into components related to population change volume effect and aging distribution effect by rewriting as follows:

$$I\ (t) = I_p\ (t)\ I_A\ (t) \quad (6)$$

With:

$$I\ (t) = \frac{\sum Pi(t)}{\sum Pi(0)} \quad (7)$$

And:

$$I\ (t) = \frac{\sum Pi(t)ci(t)}{\sum Pi(0)ci(0)} \quad (8)$$

Where:

pi (t) = The proportion of population in age group I
ci (t) = Assume to be constant over time

$$ci\ (t) = ct\ (0) \quad (9)$$

The researchers assumed further that health expenditure is proportional to age-specific mortality and this approach leads to the expression:

$$ci\ (t) = m\ (0)\ di\ (t) \quad (10)$$

Where:

m = A constant of proportionality
d = The age-specific mortality rate

Because m cancels, the index is then:

$$I\ (t) = \frac{\sum Pi(t)di(t)i}{\sum Pi(0)di(0)} \quad (11)$$

The population growth term of the multiplicative decomposition is:

$$I\ (t) = \frac{\sum Pi(t)}{\sum Pi(0)} = \frac{P_T(t)i}{P_T(0)i} \quad (12)$$

Where, the T subscript refers to total population in all age groups and the aging component is:

$$I(t) = \frac{\sum Pi(t)di(t)i}{\sum Pi(0)di(0)i} \quad (13)$$

Equation 13 can again be normalized to:

$$I\ (t) = \frac{\sum Pi(t)ci(t)}{\sum Pi(0)ci(0)} \quad (14)$$

Equation 14 shows the age-specific relative expenditure index. The higher the value of this, the greater the burden of health expenditure on those in the age group. The higher the value of this index also means that the higher the proportion of after-tax income spent on health care of those in that specific age group and hence the smaller the proportion of the after-tax income available to spent on other goods and services. Therefore, if this index is high for a particular age group, it means those in that age group will other things being equal carry a high burden of health expenditure and the effect of this is a reduction in consumption of other goods and services. For the elderly, this may increase the mortality rate as the burden of high health expenditure may leads to other

chronic diseases like high blood pressure among others which may quicken their death and hence increase in mortality rate for those at their age specific group.

Data requirement and data analysis: The data required for the analysis is health expenditure based directly on age-specific expenditure data but this is not available for most developing countries including Nigeria. In the absence of this the researchers therefore, employed total health expenditure as a proportion of age-specific population group. This is to found out the proportion of total health expenditure consumed by the elderly compared to other age group. Therefore, instead of estimating age-specific relative expenditure in line with the Eq. 14, the researchers estimate the proportion of total health expenditure consumed by each age group and determine which of the age group spend the larger proportion of the total health expenditure in Nigeria. Also the researchers relied on total out of pocket expenditure as the estimate of total expenditure since, the researchers are trying to estimate the proportion of after-tax income spent on health. Using total health expenditure which include government expenditure on health may overstate the estimation. The breakdown of total population according to the last population in Nigeria are as follows:

The Table 1 shows that 54% of the total population falls within the dependent population i.e, 1-17 and 65 years and above. Out of this 35, 107, 948 million falls within the age group 65 and above which constitute 25% of the dependent population. However, about 46% constitute the economically active population.

Table 2 shows characteristics and trend analysis of Nigerian health expenditure between 1998-2002. The Table 2 shows that the proportion of household health expenditure from total health expenditure is about 69.21%.

This implies that the larger percentage of health expenditure in Nigeria is from households and furthermore the large percentage of health expenditure indicate that households have less resources in terms of after-tax income to spend on consumption of other goods and services. The researchers therefore, employed the 2007 age-group population from Table 1 and the government total expenditure, households health expenditure and total health expenditure from Table 2 to estimate the proportion of health expenditure spend by the elderly in Nigeria.

Data analysis: From the data analysis the proportion of health expenditure consumed by each age group are as from 1998-2002 using the 2006 total population and 1998-2002 total expenditure are shown in Table 3.

Table 1: Nigerian population according to age group in 2006

Age groups	Total population
1-17	40, 725, 219
18-65	64, 598, 623
65 and above	35, 107, 948
Total	140, 431, 790

National bureau of statistics (2007)

Table 2: Characteristics and trend analysis of health expenditure in Nigeria

Health expenditure (million ₦)	1998	1999	2000	2001	2002
Total Health Expenditure (THE)	15, 7081.100	179, 891.20	215, 209.13	256, 283.42	278, 732.150
General Govt. expenses	23, 502.130	29, 882.85	40, 391.25	69, 765.96	60, 211.870
Federal	15, 199.000	16, 866.03	22, 781.25	45, 078.14	34, 538.730
State	6, 162.130	6, 486.68	13, 562.27	20, 417.73	20, 660.430
Local	2, 141.000	6, 530.14	4, 067.73	4, 270.73	5, 012.710
Private expenditure	113, 028.000	125, 096.40	139, 918.84	172, 248.41	201, 416.280
Firms	4, 308.000	6, 313.90	10, 046.77	14, 646.75	17, 817.910
Household	108, 720.000	118, 782.40	139, 918.84	157, 601.66	183, 598.370
Donors	20, 551.000	24, 911.96	34, 899.04	14, 269.05	17, 104.000
GDP (million ₦)	2882310.000	3, 322, 030.00	4, 902, 800.00	5, 702, 650.00	5, 927.680
Population (thousands)	108635.000	111, 681.00	114, 746.00	117, 823.00	120, 911.000
THE/GDP	5.450	5.42	4.39	4.49	4.700
Govt/THE	14.960	16.61	18.77	27.22	21.600
HHHE/THE	69.210	66.03	60.35	61.50	65.870
Per capita THE	1, 445.953	1, 445.95	1, 665.92	1, 981.03	2, 359.120

National Health Accounts of Nigeria, 2003-2005; HPTRP, Ibadan; Dec, 2009

Table 3: Health expenditure as a proportion of total expenditure

	Proportion of total population	Total Govt health expenditure as a proportion of total population					Total household health expenditure as a proportion of total population					Total health expenditure as a proportion of total population				
Age groups	as at 2006	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
1-17	40, 725, 219	0.058	0.073	0.099	0.171	0.147	0.267	0.291	0.336	0.387	0.451	0.386	0.442	0.528	0.629	0.684
18-65	64, 598, 623	0.036	0.046	0.063	0.108	0.093	0.168	0.184	0.217	0.244	0.284	0.243	0.279	0.333	0.397	0.432
65 and above	35, 107, 948	0.066	0.085	0.115	0.199	0.172	0.310	0.338	0.399	0.449	0.523	0.447	0.512	0.613	0.731	0.794

RESULTS AND DISCUSSION

The results show that for the 5 years considered the age-group 65 years and above spend the larger share of health expenditure. For government total health expenditure the 65 years and above age group claimed 6.6% in 1998, 8.5% in 1999, 11.5% in 2000, 19.9% in 2001, 17.2% in 2001 and 31.0% in 2002. For households total health expenditure the age group 65 years and above spent 31.0% in 1998, 33.8% in 1999, 39.9% in 2000, 44.9% in 2001 and 52.3% in 2002 and finally from total health expenditure; they spent 44.7% in 1998, 51.2% in 1999, 61.3% in 2000, 73.1% in 2001 and 79.4% in 2002. From the results it shows that throughout the period considered, the people aged 65 years and above consumed the larger percentage of government total health expenditure, households total health expenditure and total health expenditure and their share also increase over the years compare to other age groups. The implication of this is that the health expenditure per elderly is higher than the expenditure per children and per economically active population. This means that an elder in each household consumed the higher proportion of health expenditure. The results confirmed one of the fundamental assumption behind growth factor that even if health care expenditure would continue to grow even if the underlying rate of were zero depending on the population size and age structure of the population. It is hence, established that the older people consume more health expenditure per capita than any other age group.

In a country like Nigeria where health insurance is new phenomenon and has not covered a considerable number of people, most importantly it means households health expenditure on the elderly will continue to be on the high side and therefore less resources will be available to be spent on other activities. Hence, in the absence of health insurance for the elderly and also less emphasis on the elderly in government programme, the provision of health care for the elderly will primarily be from the private sources such as pensions, dis-accumulated savings, sale of assets and families transfers. This put more pressure on the family income and less attention to other needs of the elderly and other family members needs. This may creates much burden on the family and the spillover effect on the elder may be increased in the old age chronic diseases like hypertension, stroke among others which will quicken the elders death. The implication of high health expenditure on the elders therefore is high and increase in old age associated diseases and hence high and increase death rate of the elders.

CONCLUSION

The study set to examine the effect of the burden of health care expenditure on the elderly in Nigeria where social security is not available and public transfers to the elderly are very limited. The study employed a growth factor that try to find out the per capita expenditure of the elderly and its growth over the years. The growth factor method suggest that the higher the proportion of health expenditure consumed by the elderly which tends to increase over the years; the higher the burden of health expenditure on the elderly. The results shows that elderly health expenditure in Nigeria is high compared to other age groups and this was also on the increase over the 5 years period considered. Therefore, it was concluded that elderly health expenditure in Nigeria is also high as was found out in some developed countries and this put a high burden on the elder in Nigeria because it left little after-tax income at family disposal to spent on other family consumables. Hence, a high and increase in the old age related diseases and this quicken the death of the elder with a high elder death rate.

IMPLICATIONS

The policy implication of this result is that government need to pay more attention to the elderly health care need and other needs of the elder by setting up social security programme that adequately cater for the health and other needs of the older population. The social security programme can be in the form of cash transfer to the elders, purchase of drugs, food items and other goods required by the elders. Government can also set up a well functioning old age home for proper care of the elder. More importantly there is a need for health insurance for the older people to ease the pressure of elder health care expenses on the family income or pensions. These will greatly reduce the burden of elder health expenditure on the family income and hence make more resources available for other family consumables which will in effect reduce pressure on the elders in the family and hence allow them to live longer.

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