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**MARGINAL BENEFIT INCIDENCE ANALYSIS OF PUBLIC SPENDING ON
HEALTH SERVICES IN NIGERIA**

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Hrsg. von

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Zusammenfassung

Die Studie schätzt die Grenznutzeninzidenz (MBI) der Staatsausgaben für das Gesundheitswesen in Nigeria. Die Nutzeninzidenz (BIA) und die Progressivität von des Nutzens (PB) wurden mit Hilfe der Distributive Analyse Stata-Paket (DASP) 2.1 Prozedur analysiert, wie in Araar und Duclos (2009) angegeben. Die MBI wurde nach dem Verfahren von Ajwad und Wodok (2007) geschätzt. Die Studie nutzte Daten aus dem vom Nigeria Bureau of Statistics (NBS) erstellten Living Standard Household Survey (LSHS) aus dem Jahr 2004. Die Daten über die Impfung von Kindern sowie die Daten über die prä- und postnatale Beratung von Müttern wurden ebenfalls vom Living Standard Household Survey aus dem Jahre 2004 übernommen, um die Ziele der Forschungsarbeit zu erreichen. Das Ergebnis der Analyse zeigt, dass die Ausgaben für die Bereitstellung von Gesundheitsleistungen in Nigeria nicht zu Gunsten der Armen erfolgen, also nicht „pro-poor“ sind. Die Analyse der Grenznutzeninzidenz der Ausgaben für das Gesundheitswesen in Nigeria zeigt, dass die ärmsten Gruppen in den Bereichen am meisten profitieren, in denen ihre aktuelle Beteiligung (Zugang zu Gesundheitsleistungen) hoch ist. Die Studie schließt mit Empfehlungen, wie die Armen in Nigeria stärker an den Leistungen des Gesundheitswesens partizipieren können, also wie die Zugangsmöglichkeiten für diese Gruppen verbessert werden können.

Abstract

The study estimated the marginal benefit incidence (MBI) of government spending on the health service in Nigeria. Benefit incidence (BIA) and Progressivity of Benefit (PB) were analysed by using the Distributive Analysis Stata Package (DASP) 2.1 procedure as indicated in Araar and Duclos (2009). MBI was estimated following the procedure of Ajwad and Wodon (2007). The study made use of the data from the Nigeria Bureau of Statistics (NBS) most recent Living Standard Household Survey conducted in 2004. The data on child vaccination, prenatal and postnatal consultation as contained in the Living Standard Household Survey were used to achieve the objectives of this study. The results of the analysis show that spending on health provision in Nigeria is not pro-poor. Marginal benefit incidence of spending on health services in Nigeria indicates that the poorest group will benefit more on the health services in which their current participation (accessibility) rate is high. The study concludes by making recommendations that can accelerate the speed at which the poor benefit more from particular health services by organising increases in access to health services in Nigeria.

Keywords: Marginal Benefit Incidence, Progressivity of Benefit, Public Spending Health Services

Stichwörter: Grenznutzenanalyse Gesundheitsausgaben, Inzidenz Gesundheitsausgaben, Partizipation Gesundheitsleistungen

JEL-Classification: I10, I18

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Abbreviations and Acronyms

| Abbreviation/Acronym | Meaning |
|-----------------------------|---|
| BI | Benefit Incidence |
| CWIQ | Core Welfare Indicator Questionnaire |
| DASP | Distributive Analysis Stata Package |
| EAs | Enumeration Areas |
| FCT | Federal Capital Territory |
| IFHR | International Federation of Human Rights |
| FMH | Federal Ministry of Health |
| GDP | Gross Domestic Product |
| GNP | Gross National Product |
| HMB | Hospital Management Board |
| LGAs | Local Government Areas |
| MBI | Marginal Benefit Incidence |
| MDGs | Millennium Development Goals |
| NBS | National Bureau of Statistics |
| NISH | National Integrated Survey of Households |
| NLSHS | Nigerian Living Standards Household Survey |
| NPHCDA | National Primary Health Care Development Agency |
| PB | Progressivity of Benefit |
| PE | Perfect Equality |
| PHC | Primary Health Care |
| SHC | Secondary Health Care |
| SMoH | State Ministry of Health |
| SSA | Sub Saharan Africa |
| UNICEF | United Nations Children's Education Fund |

1.0 Introduction

With a population of over a 140 million people, Nigeria is the most populous country in Africa, with a GDP second only to South Africa's (Okonjo-Iweala and Osafo-Kwaako, 2007). Nigeria's economy depends heavily on the oil and gas sector, which contributes 99 percent of export revenues, more than 80 percent of government revenues. In about forty years of oil production, Nigeria has earned over \$400 billion at 1995 price from oil. With its large reserves of human and natural resources, Nigeria has the potential to build a prosperous economy, reduce poverty significantly, and provide the health services its population needs. However, available evidence indicates that these resources have not been judiciously managed to meet the need of the population in terms of human capital development (Aigbokhan, et al, 2007).

For instance, Nigeria generated about 23 trillion naira (191 billion US dollars) from oil between 1981 and 2006, which is about 83% of total government revenue. Less than 1% of GDP and about 2% of government revenue respectively was allocated to health sector in Nigeria between 1981 and 2006 (Table 1). The fact that this low financial commitment will result in inequality in access to health care resources and charges has been noted by Ogunbekun et al (1999). Since majority of Nigerians are poor and pay for their health care out of their pocket, many may be left out of health care provision. The Nigeria Project Agenda (2007) has demonstrated that the accessibility to health care facilities in Nigeria is low. It was revealed that only 3 out of 5 Nigerians have access to health care facilities. However, how much did poor benefit from these health infrastructures should be of interest to development economists because of the inequality that may be embedded in their distribution and social distortions that they may generate. This makes the analysis of distributional impact of public spending on health services in Nigeria of interest to me.

Table 1: GDP, Oil Revenues, Expenditure on Health in Nigeria 1981-2006

| Year | GDP At Current Factor Cost (Billion Naira) | Total Revenue (Billion Naira) | Oil Revenue (Billion Naira) | Exp. on Health (Current) (Billion Naira) | Exp. on Health (Capital) (Billion Naira) | Total Health Exp. (Billion Naira) | % of Total Health Exp. as % of total GDP | % of Total Health Exp. as % of FGN Revenue | % of Total Health Exp. as % of Oil Revenue |
|------|--|-------------------------------|-----------------------------|--|--|-----------------------------------|--|--|--|
| 1981 | 50.46 | 13.29 | 8.56 | 0.12 | 0.13 | 0.25 | 0.50 | 1.88 | 2.92 |
| 1982 | 51.65 | 11.43 | 7.82 | 0.12 | 0.13 | 0.25 | 0.48 | 2.19 | 3.20 |
| 1983 | 56.31 | 10.51 | 7.25 | 0.14 | 0.14 | 0.28 | 0.50 | 2.66 | 3.86 |
| 1984 | 62.47 | 11.25 | 8.27 | 0.14 | 0.05 | 0.19 | 0.30 | 1.69 | 2.30 |
| 1985 | 70.63 | 15.05 | 10.92 | 0.17 | 0.06 | 0.23 | 0.33 | 1.53 | 2.11 |
| 1986 | 71.86 | 12.60 | 8.11 | 0.28 | 0.08 | 0.36 | 0.50 | 2.86 | 4.44 |
| 1987 | 108.18 | 25.38 | 19.03 | 0.17 | 0.07 | 0.24 | 0.22 | 0.95 | 1.26 |
| 1988 | 142.62 | 27.60 | 19.83 | 0.26 | 0.18 | 0.44 | 0.31 | 1.59 | 2.22 |
| 1989 | 220.20 | 53.87 | 39.13 | 0.33 | 0.13 | 0.46 | 0.21 | 0.85 | 1.18 |
| 1990 | 271.91 | 98.10 | 71.89 | 0.40 | 0.26 | 0.66 | 0.24 | 0.67 | 0.92 |
| 1991 | 316.67 | 100.99 | 82.67 | 0.62 | 0.14 | 0.76 | 0.24 | 0.75 | 0.92 |
| 1992 | 536.30 | 190.45 | 164.08 | 0.84 | 0.19 | 1.03 | 0.19 | 0.54 | 0.63 |
| 1993 | 688.14 | 192.77 | 162.10 | 2.33 | 0.35 | 2.68 | 0.39 | 1.39 | 1.65 |
| 1994 | 904.00 | 201.91 | 160.19 | 2.07 | 0.96 | 3.03 | 0.34 | 1.50 | 1.89 |
| 1995 | 1934.83 | 459.99 | 324.55 | 3.34 | 1.73 | 5.07 | 0.26 | 1.10 | 1.56 |
| 1996 | 2703.81 | 523.60 | 408.78 | 3.19 | 1.66 | 4.85 | 0.18 | 0.93 | 1.19 |
| 1997 | 2801.97 | 591.15 | 416.81 | 3.18 | 2.62 | 5.8 | 0.21 | 0.98 | 1.39 |
| 1998 | 2721.18 | 463.60 | 324.3 | 4.86 | 7.12 | 11.98 | 0.44 | 2.58 | 3.69 |
| 1999 | 3313.56 | 949.2 | 724.4 | 8.79 | 7.39 | 16.18 | 0.49 | 1.70 | 2.23 |
| 2000 | 4727.52 | 1906 | 1591.7 | 11.61 | 6.57 | 18.18 | 0.38 | 0.95 | 1.14 |

| | | | | | | | | | |
|-------|----------|----------|----------|--------|--------|--------|------|------|------|
| 2001 | 5374.33 | 2231.6 | 1707 | 24.52 | 20.13 | 44.65 | 0.83 | 2.00 | 2.62 |
| 2002 | 6232.24 | 1731.8 | 1230.9 | 50.56 | 12.61 | 63.17 | 1.01 | 3.65 | 5.13 |
| 2003 | 6061.70 | 2575.1 | 2074.3 | 33.25 | 6.43 | 39.68 | 0.65 | 1.54 | 1.91 |
| 2004 | 11411.07 | 3920.5 | 3354.9 | 33.38 | 26.41 | 59.79 | 0.52 | 1.53 | 1.78 |
| 2005 | 3652.72 | 5547.5 | 4762.4 | 50.03 | 21.65 | 71.68 | 1.96 | 1.29 | 1.51 |
| 2006 | 3652.72 | 5965.1 | 5287.60 | 67.55 | 38.04 | 105.59 | 2.89 | 1.77 | 2.00 |
| Total | 58139.05 | 27830.34 | 22977.49 | 302.25 | 155.23 | 457.48 | 0.79 | 1.64 | 1.99 |

Source: Computed from Central Bank of Nigeria Statistical Bulletin, 2008

The rest of the paper is divided into five sections; section two deals with the research issues; section three reviews the relevant literature; section four presents the methodology that is employed in the study; section five presents and discusses the findings from the study, while section six concludes the study with policy recommendations.

2.0 Research Issues

2.1 Problem Statement

Investment in human resource development enables individuals to effectively participate in the national development process. Sen (1999) argues that premature mortality, significant undernourishment, and widespread illiteracy are deprivations that directly impoverish human life. The allocation of economic resources as well as arrangements for social provision must give some priority in removing these disadvantages for the affected population. In particular, this requires greater provision of basic education and primary health care (Gupta et al, 1999). In a similar vein, policy makers are increasingly interested in the composition of public spending. This attention stems in part from the recognition of the fact that expenditure allocation in favour of education and health can boost economic growth while promoting equity and reducing poverty (Tanzi and Chu, 1998). In this light, it is common for various international financial institutions, donors and NGOs to call for increased spending in these sectors. The emphasis on increasing public spending on primary he-

alth care is generally justified on the basis that such spending ameliorates the impact of diseases on the productive life years of the population (Gupta et al, 1999). It has been shown that the burden of diseases in developing countries can be reduced greatly if governments were to make available a minimum package of essential, cost effective clinical services (World Bank, 1993). Similarly, many studies find that the contribution of public outlays to health status as measured by infant mortality or child mortality is either smaller or statistically insignificant (Hammer et al, 1995). Demery and Walton (1998) note that public spending is a poor predictor of good health. In contrast, Anand and Ravallion (1993) and Hojman (1996) find that public health spending has a statistically significant effect on health status. Similarly, Bidani and Ravallion (1993) find that public spending has a beneficial impact on the health condition of the poor.

The contradictions in some of the evidence presented in the above mentioned studies can be explained by the fact that some relevant issues are overlooked. Allocation of funds within the sectors is widely considered to be important in explaining changes in social indicators, but these studies sidestep this issue. Also, the absence of a measureable impact of public spending on indicators could be due to a differential effect on poor and non poor groups, which are not captured by the aggregated social indicators in the studies reported above (Bidani and Ravallion, 1997; Gupta et al, 1999). The fact that the health system resources are unevenly distributed is also not taken into consideration. The fact that the allocation of these resources may not be in the favour of the poor is another critical issue.

Mainardi (2007) reported that in developing countries (Nigeria inclusive), public healthcare continues to fall short of demand, and remains unevenly distributed among the population. In several developing and transition economies, public health expenditures are considered to have tended to favour an inappropriate allocation of medical resources (Mainardi, 2007). Resource misallocation appears to be reflected in unequal social and geographical accessibility of healthcare services, and insufficient attention to specific types of ailments, forms of treatment, and measures of a preventive, rather than curative nature. Shortcomings in health service provision include insuffi-

cient stock of facilities and personnel as well as wide disparities between major urban centres and other areas. According to Marie-Claude (2008), in developing countries, some communities, regions and segments of the population are particularly disadvantaged in terms of access to public resources, and the uneven availability of such resources may contribute to the development of health disparities. In the interest of economic and social progress, the use of public resources must emphasize efficiency and equity. The efficient management of these resources is critical to growth, to human capital formation, and to the welfare of the poor. Public expenditures offer significant opportunities for promoting growth and the equitable distribution of its fruits (Mainardi, 2007).

The issue of equity in distribution of economic benefits from public investment in health service is critical in Nigeria because of pervasive poverty (more than 54% of population have been officially reported to be poor) and high inequality (income inequality and health access inequality). In Nigeria, accompanying economic growth that was experienced in 80s and 90s was serious income inequality, disparity in access to health facilities, which are believed to have widened substantially. Despite past policy to correct this abnormality, inequality has increased the dimension of poverty in Nigeria (Alabi et al, 2008). This is the reason that, as part of microeconomic objectives, Nigerian government often give equitable distribution of income a priority (Oyekale, et al, 2006). Achieving equitable distribution of income and alleviation of poverty has for some time been a major development objective. Studies have, therefore, especially in the 1970s, appraised development policies in terms of how far these objectives are being realized (Aigbokhan, 2000). Moreover, public spending on health care services can be justified in Nigeria because they will be of benefit to the poor. However, given the high level of income inequality and disparity in access to these human capital development resources, can increase in public spending on health services benefit the poor? Will it benefit poor more than the rich? Have the very poor benefited disproportionately more than the less-poor or even the non-poor from the improvements these spending brought about? Thus, these questions have to be answered if a country wants to achieve poverty reduction in the short and the

long run. More importantly, for effective policies formulation and implementation on redistribution and poverty reduction, there is need to have knowledge on the benefit incidence of public spending in Nigeria. What proportion of poor people benefited from the past government spending can guide the future spending and make it pro-poor. We still need to know who will benefit from further expenditure, as Nigeria increased her budgetary allocation to health sector by about 13-16% in 2008 (Budget, 2008). Nigeria Government has a promised to channel more fund to health provision in order to achieve the 7-Points Agenda, Millennium Development Goals (MDGs) and Vision 2020². However, if this future spending will benefit the poor depends on the marginal benefit incidence of the spending which is the focus of this study.

2.2 Research Objectives

The core objective of this study is the determination of marginal benefit incidence of Government spending on health services in Nigeria.

The specific objectives are to

- (a) Estimate the benefit incidence and progressivity of government spending on health (child vaccination, prenatal and postnatal consultation in public health institutions) in Nigeria.
- (b) Estimate marginal benefit incidence of government spending on health (child vaccination, prenatal and postnatal consultation in public health institutions) in Nigeria.

2.3 Policy Relevance

The need to study the benefit incidence in any Sub-Sahara African (SSA) is necessary because overall progress and the distribution of progress are likely to have been much more unfavourable in SSA (Grosse et al, 2006). What aggravated poverty in Nigeria is high uneven distribution of income

² Nigeria revenue profile is assumed to increase in the nearest future as a result of increase in oil price in the international market and favourable responses to tax reforms currently going on in the country.

(Okojie et al, 2001), which means that if care is not taken all the efforts of the government's spending at reducing poverty of the people may be aggravating the gap between the poor and the rich, this may not necessarily reduce poverty in the country. In fact, studies have shown that rise in inequality in Nigeria over the last two decades, is a strong cause of high incidence of poverty (Okojie and Shimeles, 2006). Hence, the study of benefit incidence of government spending in Nigeria is essential if poverty reduction goal is to be maximized and inequality minimized in Nigeria.

According to Van de Walle (1995), the study on distributional outcomes of public spending stems from three main sources. (i) Dissatisfaction with distributional outcomes in the absence of intervention. Market failures may leave many households facing acute poverty. This may be the reason for protest and violence in some part of Nigeria. But even a well-functioning market economy can result in too much poverty and inequality according to prevailing social norms. (ii) Lack of alternative policy instrument. In developed countries, the tax system provides an additional redistributive device to promote equity. In developing countries, where comprehensive income taxes are generally not a viable option, the tax system is much less useful in this task. The public spending's role in distribution becomes that much vital³. (iii) The need for fiscal restraint and the sharp tradeoffs the government faces. Government play a key role in the provision of certain public services, which are increasingly seen to be of critical importance to developing countries, notably, inputs to human capital development such as health care. Provision is expensive and so hard policy choices come to fore. Information on distributional impacts, particularly the extent to which the poorest strata benefit can help in making those choices. All these sources are inherent in the public system in Nigeria, therefore the need to study distributional outcome of public spending in Nigeria.

Moreover, the Nigerian President said that he is more committed to tackling the root causes of violence and poverty in the Nigeria. In that regard, he came with a 7- Points Agenda for the development of Nigeria to achieve

³ In Nigeria, the tax component as part of total government revenue is less than 15%.

sustained growth and poverty reduction. These 7- Points Agenda is the framework for achieving Vision 2020 by the government of Nigeria. The principal focal areas of the agenda are: health care provision, education provision, poverty reduction, inequality reduction and infrastructural development. The 7-Point Agenda recognises that 'middle class has all but disappeared in Nigeria. The major aim of the Agenda is to introduce policies and measure that would lead to the re-emergence of a vibrant middle class with positive impact on the quality and standard of living of all Nigerians' (Nigeria Project Agenda, 2007, page 11). According to the Agenda, the challenge for on-going and future reforms in Nigeria is to ensure that the benefits positively affects and impacts all Nigerians. It is to be noted that the past president always come with agenda that is not based on scientific or analytical anchors. That most of the time, makes the government spending on these focal areas expensive failure. However, the current president has made it clear that the new administration is open to scientific inputs from researchers so as to achieve the targets of these Agenda (Jonathan, 2008). This study will provide a basis on which these investments in health care provision can be based to make it pro-poor. This study intends to do that by providing information on how the poor and non poor are currently benefiting from the government spending, and how they will benefit from further spending in the healthcare services. This may form the basis for government redistributive efforts.

3.0 Literature Review

3.1 Structure of the Health System in Nigeria

All three levels of government, the Federal, State and Local Government Areas (LGAs), have responsibilities for the provision of health care. The 36 States (and FCT) and 774 LGA's are responsible for all financial aspects of Secondary Health Care (SHC) and Primary Health Care (PHC) departments, including personnel costs, consumables, running costs and capital investment. The Federal government sets overall policy goals, co-ordinates activities, ensures quality, training and implements sector programmes such as immunisation. The National Primary Health Care Development Agency

(NPHCDA) provides a source of technical knowledge and expertise on the provision of PHC and monitors PHC delivery on behalf of the Federal Ministry of Health. Public PHC services are funded and administered by the State Ministries of Health (SMoHs), which provide technical assistance to the LGAs under the PHC Director in the SMoH. PHC services are the direct responsibility of LGAs whilst SHC services come under the State Hospital Management Board (HMB). However, there are very few links between the two (FMH, 2009). As a result, the referral system is weak and undeveloped. Many of the health problems that the country faces could be reduced through improvements at the primary care level, but there are many constraints. According to (FMH, 2009), inadequate financial resource (\$2-3 per capita) for the health sector is a major problem. Since the beginning of the economic crisis in the 1980s, the health sector has suffered dramatically as all other public service activity. Development and recurrent expenditure has declined resulting in a scarcity of drugs and medical supplies, and the deterioration of facilities. According to the World Bank (2000), public health financing of 0.3 per cent of GNP in Nigeria remains lower in real per capita terms compared with the late 1970s and early 1980s. About 60 per cent of health service expenditure now occurs outside of the public sector on a range of non-profit, traditional and modern practitioners. Nationally, the principal actors in the formal private sector are for-profit patent medicine vendors and registered pharmacies. In Nigeria, nearly 15 per cent of Nigerian children do not survive to their fifth birthday. Two leading causes of child mortality are malaria (30 per cent), and diarrhoea (20 per cent). The importance of malaria as devastating disease of children in Nigeria has been highlighted in Okafor and Amzat (2007)⁴. Malnutrition contributes to 52 per cent of deaths of children under five. There is a growing incidence and prevalence of non-communicable diseases. For example, hypertension is generally estimated at 8-10 per cent for rural and 10-12 percent for urban communities. Okonjo-lweala and Osafo-Kwaako (2007) have reported low immunization of children

⁴According to Okafor and Amzat (2007), over 30% of all outpatient clinic visits are for malaria over 50% of outpatients attendances and 40% of hospital admissions, 30% of child mortality and 10% of maternal mortality are due to malaria in Nigeria.

in Nigeria. They reported that only 35% of the children that were supposed to be immunized received measles vaccines in Nigeria, compared with an average of 63% for Low Income Countries (Annex Table 1). The consequences of low immunisation are high infant and under-five mortality rates which were higher than the average for the low income countries as reported by Okonjo-lweala and Osafo-Kwaako, 2007). The accessibility to health services was 65% as estimated by UNICEF (1996) in Nigeria, which is declining over the year. The fact that the health conditions of Nigerians are poor and that Nigeria is not making much progress toward achieving health millennium development related goals is demonstrated in Annex Table 2. This is supported in Annex Table 3, which illustrates that Nigeria was not able to achieve all the health set goals for 2007.

3.2 Review of Benefit Incidence of Public Spending on Health

The past decade has seen a resurgence of interest in the relationship between poverty and public spending in developing economies. This resurgence has fostered the return of incidence analysis, particularly, the benefit of public spending in the social sectors. Although, analysis of tax incidence has a long and venerable history in economics, distributional analysis of the benefits of public spending and public policy generally is more recent (Younger, 2003). Benefit incidence analysis (BIA) is widely used to infer distributional impacts of public spending. It depends on both the allocation of public spending and the behavior of households in using the services. While benefit incidence analysis is a well-established tool in understanding who benefits from public spending, it has its limitations. Among the most common criticisms of standard benefit incidence analysis is that its description of average participation rates is not necessarily useful in guiding marginal changes in public spending policies (Lipton and Ravallion, 1995). However, because of a presumed preference for public spending that benefits the poor people, programmes and policies are viewed as more favourable if the average participation of the poor people in such programmes and policies is higher than the participation of non-poor people. A large increase in availability of nationally representative household survey and the ease at which it can be computed

made it popular feature of poverty analysis in developing countries. The standard BIA method describes who is currently benefiting from a particular public expenditure. As such, is a useful guide to the effects of a policy change that distributes benefit in proportion to current benefits (Younger, 2003). Therefore, standard BIA will be a useful guide in an efforts to redistribute current benefits among the poor and non poor. This is more important in high income inequality country as Nigeria. According to Reinikka (2002), employing BIA is most deserving because of evidence of limited impact of public spending on growth and human development outcome which is the case in Nigeria.

A vast body of literature exists on the incidence of government expenditures. Most of the studies have used the benefit incidence approach on household data. Findings demonstrate that public expenditures are either progressive or regressive and the share of different income groups varies depending on the distribution of the benefits of the public expenditures across region, caste, religions, gender etc. (Hakro and Akram, 2007). The studies which demonstrate progressiveness such as Rasmus et al. (2001) focus on the incidence of the public expenditure on health (Mozambique data) and reported that the poorest quintile of income groups receiving less than the share of the richest quintile. Cross country studies such as Gupta et al. (2002) used 56 data sets and showed that the increase in public expenditures on health are associated with improvement in both access to and reduce the mortality rates in infants and children. Hamid *et al* (2003) has also shown evidence of substantial cross-country heterogeneity. A review of evidence from benefit incidence of public spending in developing countries (Chu et al. 2000, covering 55 such studies) highlighted some important findings. In the majority of cases, overall public spending in each of the areas of health was found to be progressive, but it was often poorly targeted, most often in Sub-Saharan Africa. The empirical evidences of benefit incidence of spending on health in some selected developing countries are summarized in Annex Table 4.

3.3 Review of Marginal Benefit Incidence of Public Spending

A policy change that increases spending will not necessarily go to existing beneficiaries in proportion to their current benefits or even go to existing

beneficiaries at all. In these cases, standard BIA method may be insufficient in analysing the distributional effects of public spending (Younger, 2003). In response to these observations, several recent studies have proposed alternative methods to measure the marginal benefit incidence (MBI) of public spending. Marginal incidence analysis measures the incidence of actual increases or proposed cuts in programme spending. This approach departs from standard benefit incidence analysis that attempts to estimate how the average benefits from public spending are distributed at point in time (Van de Walle, 2002a). The latter can be deceptive about how changes in public expenditures will be distributed. It is possible, for example, that the political economy of incidence means that the rich tend to receive a large share of the infra-marginal subsidies, while the poor benefit most from extra spending. Ravallion (1999) provides a model of the political economy of fiscal adjustment that can generate such an outcome. The simplest way to identify marginal incidence is to compare average incidence across geographic areas with different degree of programme sizes. This is essentially the method of the study by Lanjouw and Ravallion (1999) who used data from India's National Sample Survey (NSS) for 1993-1994. Glick and Razakamanantsoa (2001) and Younger (2002) examine shares of the change in benefit over time across the expenditure distribution. Lanjouw and Ravallion (1999) estimate the 'marginal odds of participation' for each expenditure quintile as the coefficient in a regression of quintile and small area participation rates. Lanjouw et al. (2002) and Ravallion (1999) apply a similar technique to panel data to control for fixed effect characteristics. Younger (1999, 2002) considers marginal incidence to be the distribution of compensating variations for marginal policy changes, based on estimated demands for public services. Ajwad and Wodon (2002; 2003, and 2007) improved on the Lanjouw and Ravallion (1999) method by defining the income quintile according to the position in the departmental distribution of income, with the country being divided into several departments. The implication of this modification is that, the poorest household in the richest department is classified as belonging to the poorest quintile, together with the poorest household in the poorest department, even though the poorest household in the richest department may belong to a higher quintile in the overall distri-

bution of income. Lanjouw and Ravallion (1999) found out that primary school enrolment rise with household expenditure per capita nationally, and in all states. They indicated that enrolment tends to be lowest for the poorest quintiles, and to increase as consumption per person increases. Their average odd of enrolment (marginal benefit) suggests that subsidies to primary schooling would mildly favour the non-poor⁵. With a data set from Ecuador, Younger (1999) used a combination of benefit and behavioral approaches and found that public spending improves health and education indicators in developing countries. Ajwad and Wodon (2001) investigated whether people benefit more or less than the non poor from an expansion in access to public services. In answering the question, they applied marginal benefit incidence analysis to local-level data from Bolivia and Paraguay. Their results indicated that the marginal benefit incidence is higher (or at least not systematically lower) for the poor than for the non poor in most of the basic services. They concluded in the paper that pro-poor policies must be implemented if the poor are to reap the benefits of gains in access to social capital faster.

Ajwad and Wodon (2002) estimated average benefit and marginal benefit incidence for Sri Lanka. In their study they revealed that the highest disparities between the access rates of rich and poor households are for access to electricity and indoor taps (i.e., piped water connection within the house. In many cases, their estimates suggested that households in the poorest quintile would benefit more than the average household from an overall increase in access rates. However, they claimed that the richest quintile of households benefits more than the average household from an expansion in access to public or private medical facility centre. Ajwad and Wodon (2003) indicated that although there are important differences between different types of services, in many cases marginal benefit incidence tends to be more pro-poor than benefit incidence, especially once the non-poor already have high levels of access. By contrast, when access rates are relatively low, special efforts may be needed to ensure that the poor benefit from future increases in access. This finding is reinforced in Ajwad and Wodon (2007) study in Bolivia

⁵ They did not split public from private schooling in the data they used.

and Paraguay.

Kruse et al (2009) estimated marginal benefit incidence analysis for Indonesia. Taking into account behavioural responses to changes in public spending, they suggested that increased public health spending improves targeting of public funds to the poor. At the margin, increased local public health spending leads to net public resource transfers from the richest to the poorest quarter of the population, as such spending increases both - public health care utilization by the poor and the average benefit of public funds for the poor through using these services. However, they concluded that initial utilization shares still dominate the marginal benefits, such that the bulk of the benefits accrue to the two middle quartiles. Hence, they recommended that for effective targeting of public resources to the poor, increased public health spending induced through reallocation of central resources could be complemented with more directly targeted demand side interventions, for example price subsidies for the poor or social health insurance.

4.0 Methodology

4.1 Data Sources and Collections

This study was carried out in Nigeria. Nigeria lies between $4^{\circ}16'$ and $13^{\circ}53'$ North Latitude and between $2^{\circ}40'$ and $14^{\circ}41'$ East Longitude. It is located in the West Africa bordered on the West by the Republic of Benin, on the North by the Republic of Niger and on the east by the Republic of Cameroon. To the South, Nigeria is bordered by approximately 800 kilometers of the Atlantic Ocean, stretching from Badagry in the west to the Rio del Rey in the east. The country also occupies a land area of 923,768 kilometers and the vegetation ranges from mangrove forest on the coast to desert in the far north.

Administration-wise, Nigeria consists of 36 states and a Federal Capital Territory. Each state is further divided into Local Government Areas (LGAs). These are presently 774 LGAs in the country. Nigeria returned into democratic rule in May 1999 under presidential system of government at federal, state and local government area levels. The federal government comprises of

an Executive arm, a bicameral legislative arm and the judiciary. Each state has her own executive arm and house of assembly while each local government has a chairman and a council. The total population of Nigeria according to 2005 census was about 140 million.

The study made use of Nigeria Bureau of Statistics (NBS)'s Living Standard Household Survey conducted in 2004. The Household Survey was conducted with assistance from European Union, World Bank, Department for International Development and United Nations Development Programme to ensure good quality of the data generation. The survey had a national coverage, that is, all the 36 states of the Federation including the Federal Capital Territory of Abuja were covered. The sample design for the survey was a two stage stratified sample design. The first stage was the division of each state into clusters called Enumeration Areas (EAs), while the second stage was the division of enumeration areas into housing units. One hundred and twenty (120) EAs were created for each state and 60 EAs for the Federal Capital Territory for the twelve months survey duration. Ten EAs for each state and five EAs for the FCT were covered per month (The survey was conducted through the twelve months period). In each of the enumeration areas, 5 housing units were scientifically selected and studied. On the whole, 600 housing units were studied per state and 300 for the FCT. The survey has information on 96,610 respondents from 19,158 households. Data on health (child vaccination, pre-natal and postnatal consultations in public health institution) based on location, region and per capita expenditure (deflated by the region current prices) were extracted from the survey and analysed in this study.

4.2 Data Analysis Techniques

4.2.1 Benefit Incidence Analysis (BIA)

The main objective of using a benefit incidence approach is to analyse the distribution of benefits from the use of public services according to the distribution of living standards. Two main sources of information are used. The first informs on the access of household members to public services. The benefit incidence approach combines the use of these two sources of information to analyse the distribution of public benefits and its progressiv-

ity. The advantage of Distributive Analysis Stata Package (DASP) 2.1 is the possibility of using frequency data approach when information about the level of total public expenditure is not available⁶. We performed Benefit Incidence using Distributive Analysis Stata Package (DASP) 2.1 procedure as indicated in Araar and Duclos (2009). This was done for all categories of the benefits (child vaccination, prenatal and postnatal care based on location (rural and urban) region (there are six regions in Nigeria) and nationally. Improving the health status of the poor makes a significant contribution to escape from poverty. Child vaccination, prenatal and postnatal consultations in public health institutions were selected as health service indicators in this study because they are preventive measures to reduce infant and maternal mortalities which were reported to be higher in Nigeria than the average for the Low Income Countries (Okonjo-Iweala and Osafo-Kwaako, 2007)⁷. McGuire (2006) has shown that in a cross section of developing countries, access to maternal and infant health programs was correlated with decreased under-five mortality.

4.2.2 Progressivity of the Benefits (PB)

Progressivity of Benefit (PB) was analysed using Distributive Analysis Stata Package (DASP) 2.1 procedure as indicated in Araar and Duclos (2009). In following their procedure, we estimated the progressivity of benefit by comparing the Lorenz and concentration curves. In doing this, the household expenditure of the people was ranked in ascending order; then the benefits (child vaccination, pre and postnatal consultation) were ranked according to their associated expenditure. The concentration curve shows the proportion of benefit enjoyed by the bottom p proportion of population. We supplemented the estimation of progressivity with concentration Index. Normally, the higher the index, the more concentrated is the benefit and the higher the inequality.

⁶ We were not able to get information on expenditure on these social services as the government agencies considered them as official documents. This fact that Nigeria government is reluctant in releasing some of their expenditure profile has been alluded to by Hinchliffe (2002).

⁷ The fact that under five mortality rate of 194 estimated for Nigeria is higher than the average for SSA can be attributed to the decline in immunization between 1990 and 2007. The measles immunization declined from 54% to 35% within the period, while it increases from 56% to 73% between 1990 and 2007 in SSA (Alabi and Adams, 2010).

Hence, of the two benefit schemes, the more regressive one would be associated with the highest concentration index (Kamgnia, 2008).

4.2.3 Marginal Benefit Incidence Analysis

To determine whether a government maximizes average access rates across municipalities over time, it is typically necessary to have panel data with information on both income/expenditure and access to services for various areas or administrative entities over time. Without such panel data, location unobserved heterogeneity cannot be controlled for. Unfortunately, panel data are often not available in the case of Nigeria as in other developing countries. The data restrictions often encountered require a technique for identifying the beneficiaries of public service expansion using only cross sectional data. Ajwad and Wodon (2007) and Lanjouw and Ravallion (1999) proposed alternative empirical methodologies that use a single cross section⁸. Both papers use the geographic variation in access rates across regions in a country to capture the expected evolution over time, had one region been followed over time. Thus, cross sectional variation in access rates were exploited to conduct a marginal benefit incidence analysis study⁹. So, in estimating the marginal benefit incidence we followed the procedure of Ajwad and Wodon (2007).

In following the steps of Ajwad and Wodon (2007), we defined $i = 1, \dots, N$

⁸ The approaches differ in the manner in which the countries are ranked. Lanjouw and Ravallion (1999) classify municipalities as poor or rich according to their rank in the national distribution of income. On the other hand, Wodon and Ajwad (2007) classify municipalities according to their rank in the local (i.e., state) distribution of income, rather than the national-level. Under a decentralized system of government, as is observed in Bolivia, a local ranking may be more appropriate. Despite the differences in the ranking between the above studies, the objective of both papers is to determine the beneficiaries of the various public services.

⁹ Said differently, the method subsumes that different regions are in different levels of development, with poorer regions today being like the richer ones in the past. In terms of access most services, this assumption seems reasonable. However, there may be some types of services for which technological advances may change access rates patterns so much that this assumption would not be valid. One example could be access to mobile phones, where network-based physical investments are much smaller than for the fixed line network, so that depending on needs and pricing, we could potentially see some poorer regions catch up faster with richer regions and overcome regions at medium stages of development in any given country. Technological developments may well change the basic structure assumed in our model and test.

states, which in this case are 37 states¹⁰ in Nigeria. We ranked the households by expenditure per capita within each state and assign them to one of $q = 1, \dots, Q$ expenditure bracket intervals (these quintiles were defined at the state level). We denoted X_{ij}^q , the benefit incidence of a programme or service in state J belonging to interval q of state i . This benefit incidence reflects the share of the population with access to the public programme or service¹¹. The mean benefit incidence in interval q for state i is denoted by X_i^q , and the overall state mean is denoted by \bar{X}_J and J_i^q is the number of households in interval q of state i . The two means are respectively equal to:

$$X_i^q = \frac{\sum_{J=1}^{J_i^q} X_{ij}^q}{J_i^q}$$

$$\bar{X}_J = \frac{\sum_{q=1}^Q \sum_{J=1}^{J_i^q} X_{ij}^q}{\sum_{q=1}^Q J_i^q} \quad (3)$$

The households are ranked by expenditure interval at the state level. The method of estimating the distribution of marginal benefit incidence consists of using the geographic variation in access (both between households and between states) as a source of information for understanding the diffusion process generating access. This was done by regressing the benefit incidence in each of the intervals against the state means, using Q regressions as follows:

$$X_i^q = a^q + \beta^q \left[\frac{\sum_{q=1, j=1}^{Q, J_i^q} x_{ij}^q - \sum_{j=1}^{J_i^q} x_{ij}^q}{\sum_{q=1}^Q J_i^q - J_i^q} \right] + \varepsilon_i^q \quad (4)$$

for $q = 1, \dots, Q$

¹⁰ The states are 36 states with Federal Capital Territory.

¹¹ In this case the services are child vaccination, pre and postnatal consultations in public health institution in Nigeria.

In the first and poorest interval ($q = 1$), equation 4 yields a regression of the mean level of programme participation in the poorest households in the various states on the mean level of programme participation in the corresponding state. To avoid endogeneity, the right hand side variable was computed at the state level as the mean on all the households except those belonging to interval q . We assumed that all the intervals within a given state have the same number of households ($J_i^q = J_i$). With $J_i^q = J_i$ for all i , then we

have $\sum_{q=1}^Q X_i^q = Q\bar{X}_i$, equation (4) can be simplified as follows:

$$X_i^q = a^q + \beta^q \left(\frac{Q\bar{X}_i - X_i^q}{Q-1} \right) + \varepsilon_i^q \quad (5)$$

for $q = 1, \dots, Q$

We pulled all the observations from the various intervals together and estimate 5 as a single equation as follows:

$$X_i^q = \sum_{q=1}^Q a^q + \sum_{q=1}^Q \beta^q \left(\frac{\sum_{q=1}^Q X_i^q - X_i^q}{Q-1} \right) + \varepsilon_i^q \quad (6)$$

In equation 6, the intercepts and the slopes are allowed to differ for various intervals, this is an implicit restriction. It must be that across the various intervals, the average marginal increase in access from a unitary increase in mean access is one¹². The restriction can be made explicit by totally differentiating

$$\bar{X}_i^q = \frac{1/Q \sum_{q=1}^Q X_i^q}{-} \quad (7)$$

$$\text{So that: } \sum_{q=1}^Q \left(\frac{\beta^q}{Q-1 + \beta^q} \right) = 1 \quad (8)$$

¹² The restriction is that the mean marginal benefit incidence estimates for all the categories must be equal to one.

Writing β^Q , the parameter for the last interval Q, in terms of the other parameters yields:

$$\beta^Q = X_i^Q = \frac{(Q-1)(1 - \sum_{q=1}^{Q-1} \beta^q / (Q-1 + \beta^q))}{\sum_{q=1}^{Q-1} \frac{\beta^q}{Q-1 + \beta^q}} \quad (9)$$

Taking into account restriction in 8, we can rewrite equation 6 as

$$X_i^q = \sum_{q=1}^Q a^q + \sum_{q=1}^{Q-1} \beta^q \left(\frac{\sum_{q=1}^Q X_i^q - X_i^Q}{Q-1} \right) + (Q-1) \frac{\left(1 - \sum_{q=1}^{Q-1} \frac{\beta^q}{Q-1 + \beta^q} \right)}{\sum_{q=1}^{Q-1} \frac{\beta^q}{Q-1 + \beta^q}} \left(\frac{\sum_{q=1}^Q X_i^q - X_i^Q}{Q-1} \right) + \varepsilon_i^q$$

(10)

Dropping the error term and rearranging the terms equation 10 yields

$$X_i^q = \frac{a^q + \beta^q (Q/Q-1) \bar{X}_i}{1 + \frac{\beta^q}{Q-1}} \quad (11)$$

for $q = 1, \dots, Q$

Therefore, a change in programme benefit incidence for the household belonging to q in response to change or increase in the aggregate incidence at the state level is given by

$$\frac{\partial X_i^q}{\partial \bar{X}_i} = \frac{Q\beta^q}{Q-1 + \beta^q} \quad (12)$$

for $q = 1, \dots, Q$

The right side values of equation 12 $\left(\frac{Q\beta^q}{Q-1 + \beta^q} \right)$ are the estimates of marginal

benefit incidence. A value larger (smaller) than one implies that the corresponding group of households benefit more (less) than all the households on average from an expansion in public programs or services.

Equation 6 was estimated through non-linear least square methodology as contained in DASP 2.1. The marginal benefit incidence estimates were obtained for child vaccination, prenatal and postnatal healthcares consultation in public health institutions in Nigeria.

5.0 Results and Discussions

5.1 Results and Discussions of Benefit Incidence of Public Spending on Vaccination, Pre and Postnatal Consultations in Nigeria

Generally, the participation rate of under-five year vaccination is low in Nigeria as indicated in Table 2. The table indicates that only 46% of the children that eligible for vaccination were vaccinated, while 51% of eligible children from richest quintile participated in vaccination, 44% of eligible children from poorest quintile participated in vaccination programme. According to NBS (2004), the reasons for non-participation in vaccination programme as given by the respondents are, ignorance about the vaccination (27%), the vaccination centre is too far (20%), short supply of vaccine (7%), cost (3%) and other reasons (41%)¹³. The same trend of low participation is also noticed in prenatal and postnatal consultations. Table 2 reveals that only 45% and 21% of women that supposed to consult public health institution for prenatal and postnatal health care did. The reasons for low participation in prenatal consultation can not only because of the cost, as only 55% of them that went for prenatal consultation claimed that they paid, the other reasons given by the women in the survey are that they did not know it was necessary (41%)¹⁴, unavailability of prenatal consultation centre (18%), the centre is too far (16%), cannot afford it (10%) and other reasons (15%). The low rate of vaccination, prenatal and postnatal consultations have implication for under-five,

¹³ These other reasons may include socio-cultural and religious beliefs.

¹⁴ The fact that prenatal consultation is free and that postnatal consultation is not free may account for different level of use between prenatal and postnatal consultations. Ignorance about the importance of postnatal consultation may also account for lower use of postnatal consultation in Nigeria, because, the woman who may need the postnatal consultation has delivered the baby, she felt some relief and may not see the reason for further healthcare consultation.

infant and maternal mortalities in Nigeria. The under-five mortality rate of 194 per 1000 births in Nigeria which is higher than the Sub Sahara Africa's average of 183 per 1000 births, has been attributed to the decline in child vaccination in Nigeria (Alabi and Adams, 2010). They indicated that the measles vaccination declined from 54% to 35% between 1990 and 2007, while it increased from 56% to 73% between 1990 and 2007 in the whole of Sub Sahara Africa. FIDH (2010) reveals that healthcare facilities in Nigeria are inadequate in quality, number, and funding and that lack of access to prenatal and postnatal care contributes to the high maternal mortality rate in Nigeria. FIDH (2010) reveals further that Nigeria has the world second highest maternal mortality rate (1,100 per 100,000 births) in 2007 after India.

The social selectivity based on income is also noticed in vaccination, prenatal and postnatal consultations. For example, the poorest quintile shares 19%, 13% and 11% of public spending on vaccination, prenatal and postnatal consultation respectively, the shares of the richest quintile are 22%, 28% and 29% respectively. This indicated that the richest quintiles benefited more than the poorest quintiles on public spending on vaccination, prenatal and postnatal consultation. Other scholars have also reported that the richest benefited more than the poorest on public spending on health in Africa (Demery, 2000; Djindil et al., 2008)

The North-South disparity can also be observed in the incidence of public spending on vaccination, prenatal and postnatal consultation in Nigeria as indicated in Table 3. The South East has the highest share of vaccination (23%), while the North-Central has the lowest share of vaccination (9%)¹⁵.

¹⁵ There was a boycott of the polio vaccination campaign in Northern Nigeria, which has indefinitely stalled global polio eradication targets. The polio immunization drive was brought to a standstill in July 2003 as religious and political leaders in northern Nigeria responded to fears that the vaccines were deliberately contaminated with anti-fertility agents and the HIV virus. Although the polio vaccine boycott has proved costly in both economic and human terms, it has opened important lines of communication at global and national levels, potentially deepening dialogue, participation and sensitivity necessary for global health campaigns. Although immunization comes with countless benefits, it is a complex and difficult health strategy to enforce (Yahya, 2009).

However, the share of prenatal and postnatal consultations was in the favour of the North. The share of the North-West in public spending on prenatal and postnatal consultation were 21% and 25% respectively, the South-South had the lowest share of prenatal consultation (13%) and the South East had the lowest share of postnatal consultation. This may be due to the fact that health institutions where prenatal and postnatal consultation can be administered are more in the Northern part than in the Southern part of the country. NBS (2005) indicated that there are more public health care facilities in the Northern part of Nigeria, while the Southern part has more of private health care providers.

Table 3 indicates that location effect is also significant in the incidence of public spending on health in Nigeria. The table shows that the urban area shared 58%, 55% and 54% of public spending on vaccination, prenatal and postnatal cares respectively, while the shares of the rural area were 42%, 46% and 47% respectively. The reasons for these disparities may be attributed to the fact that the centres where vaccinations, prenatal and postnatal cares were administered were concentrated in the urban areas. For example, Ogunbekun (1992) has indicated that most of health facilities in Nigeria are located in urban areas. Ojo (1990) also supported the fact that there are inequalities in the distribution of health care resources in Nigeria, which may affect the pattern of its demand.

Table 2: Benefit Incidence of Public Spending on Vaccination, Pre- and Postnatal Consultation in Nigeria

| Quintile | Vaccination | | Prenatal Consultation | | Postnatal Consultation | |
|----------|-----------------------|----------------|-----------------------|----------------|------------------------|----------------|
| | Rate of Participation | Share by Group | Rate of Participation | Share by Group | Rate of Participation | Share by Group |
| Poorest | 0.439 | 0.192 | 0.281 | 0.125 | 0.118 | 0.114 |
| Poor | 0.450 | 0.197 | 0.358 | 0.156 | 0.167 | 0.162 |
| Average | 0.448 | 0.195 | 0.411 | 0.186 | 0.197 | 0.192 |

| | | | | | | |
|---------|-------|-------|-------|-------|-------|-------|
| Rich | 0.433 | 0.191 | 0.565 | 0.252 | 0.250 | 0.243 |
| Richest | 0.511 | 0.244 | 0.634 | 0.282 | 0.296 | 0.288 |
| All | 0.456 | 1.00 | 0.450 | 1.00 | 0.206 | 1.00 |

Sources: Authors' Computation Based on NBS (2004)

Table 3: Benefit Incidence of Public Spending on Vaccination, Pre- and Post-natal Consultation Based on Location and Regions

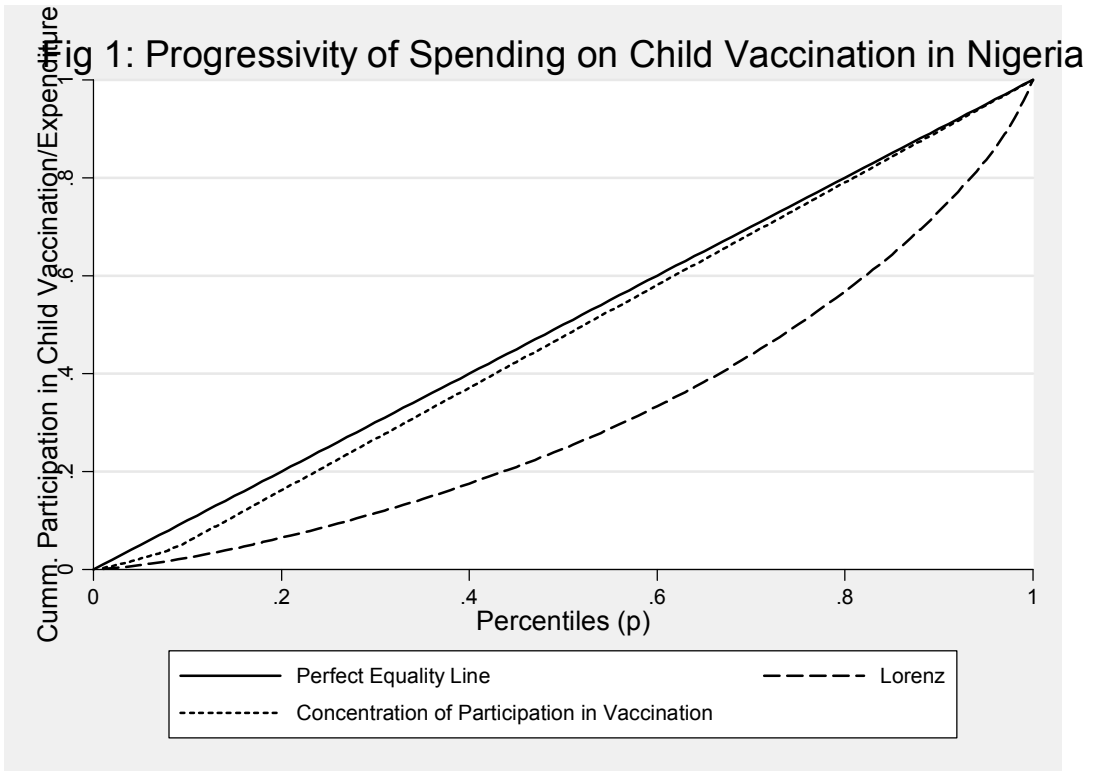
| Region | Vaccination | | Prenatal Consultation | | Postnatal Consultation | |
|---------------|-----------------------|----------------|-----------------------|----------------|------------------------|----------------|
| | Rate of Participation | Share by Group | Rate of Participation | Share by Group | Rate of Participation | Share by Group |
| South South | 0.429 | 0.177 | 0.697 | 0.130 | 0.249 | 0.138 |
| South East | 0.458 | 0.230 | 0.801 | 0.143 | 0.327 | 0.130 |
| South West | 0.395 | 0.210 | 0.832 | 0.178 | 0.323 | 0.186 |
| North Central | 0.444 | 0.093 | 0.525 | 0.158 | 0.233 | 0.150 |
| North East | 0.448 | 0.115 | 0.411 | 0.183 | 0.160 | 0.142 |
| North West | 0.625 | 0.175 | 0.231 | 0.207 | 0.141 | 0.253 |
| All | 0.456 | 1.00 | 0.450 | 1.00 | 0.206 | 1.00 |
| Urban | 0.445 | 0.579 | 0.599 | 0.545 | 0.271 | 0.535 |
| Rural | 0.472 | 0.421 | 0.346 | 0.455 | 0.161 | 0.465 |
| All | 0.456 | 1.00 | 0.450 | 1.00 | 0.206 | 1.00 |

Sources: Authors' Computation Based on NBS (2004)

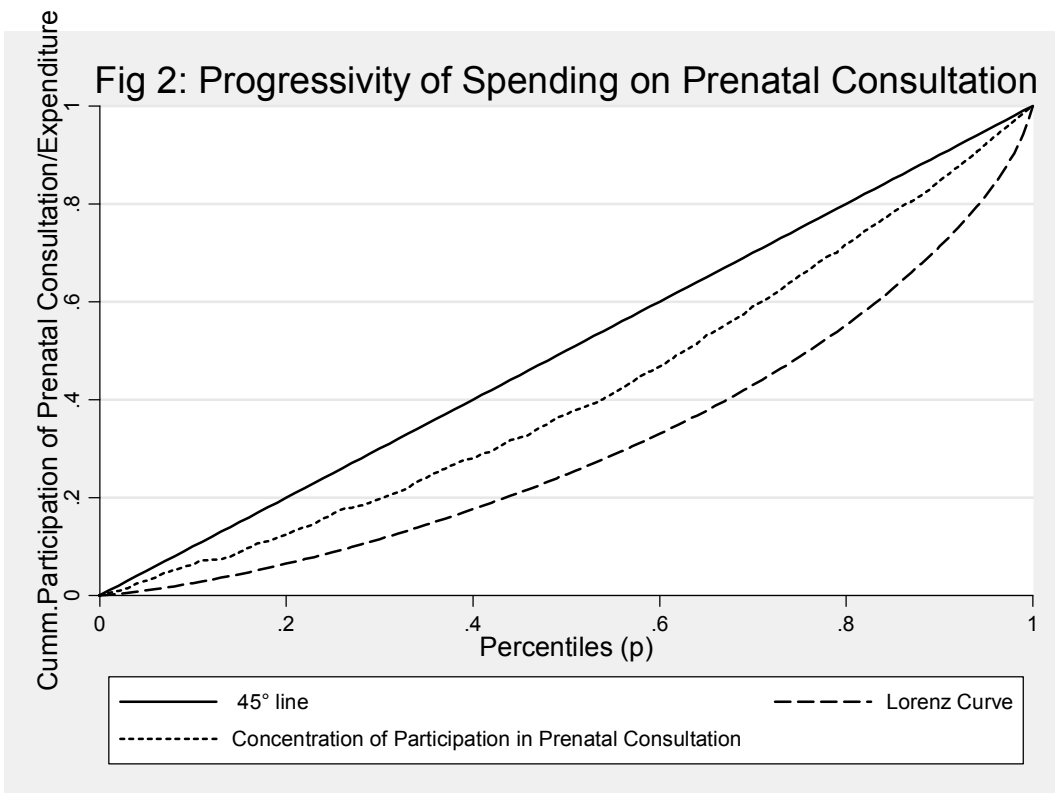
5.2 Results and Discussions of Progressivity of Public Spending on Vaccination, Pre and Postnatal Consultations in Nigeria

Here we supplemented the Benefit Incidence Analysis with graphical analyses. Figures 1 to Figure 3 suggest that the concentration curves of vaccination, pre and postnatal consultations in Nigeria lie above the Lorenz curve but below the diagonal, this indicates that the public spending on them is relatively progressive. This implies that child vaccination, pre and postnatal consultations services are more evenly distributed than the expenditure (income). This fact is established in Table 4, where the Gini coefficient is greater than the concentration indices of participation in vaccination, pre and postnatal consultations. However, since the concentration curves for participation in them do not lie above the diagonal, it shows that spending is not progressive in absolute term. This indicates that they are not well targeted at the poor or that the spending on them is not pro-poor. This reinforces the findings of the benefit incidence reported in Table 1 that the shares of the richest income group in spending on these services are higher than the share of the poorest income group.. The fact that the spending is regressive in absolute terms implies that the poorest 20% get less than 20% of the benefit of public spending in all the services considered in this study. This finding is in consonance with the result of the study by Rasmus et al (2001). Rasmus et al (2001) reported that prenatal care and child vaccinations are progressive in Mozambique, with concentration curves that are close to the 45-degree line. Among curative services, they indicated that hospital and health centre services are relatively progressive, but not pro-poor.

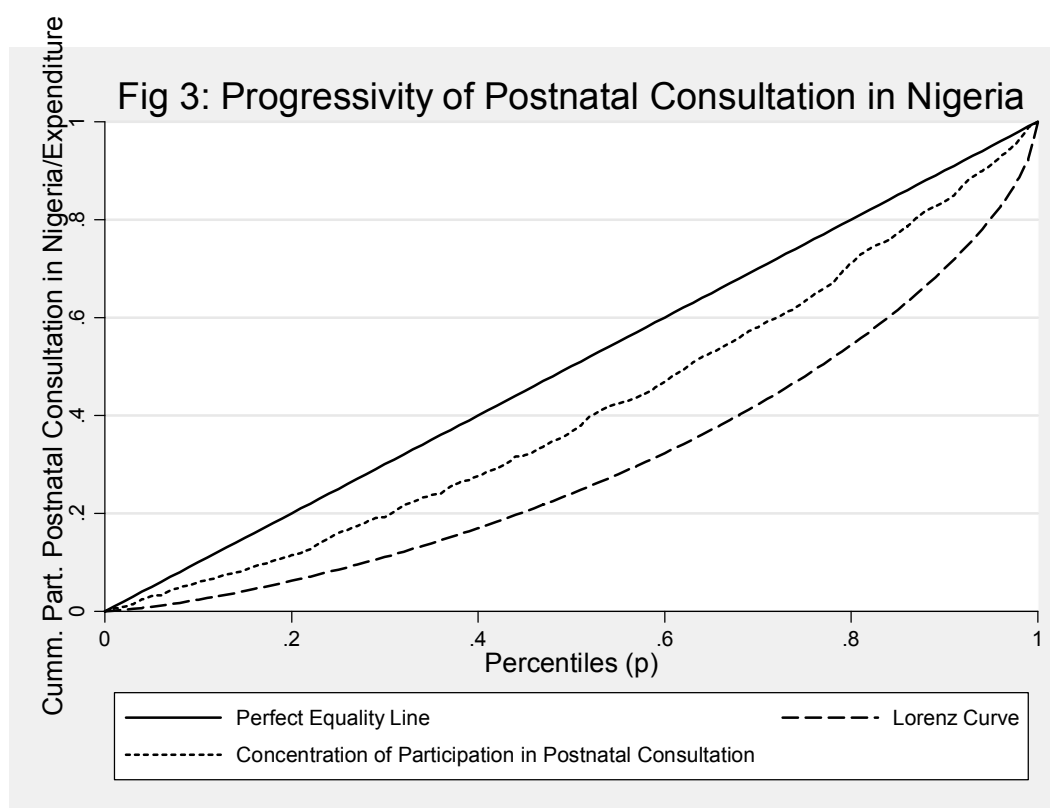
Table 4 also demonstrates that out of all the health variables considered in this study, child vaccination has the lowest Concentration Index (0.021). This implies that spending on child vaccination is the most progressive among all the health spending considered in this study. The reason for this may not be far-fetched. The vaccination programmes in Nigeria target places where the children of the poor can be found. Most of the time, the vaccinators visit the relevant places to vaccinate the children.



Source: Computed from NBS (2004)



Source: Computed from NBS (2004)



Source: Computed from NBS (2004)

Table 4: Concentration Indices for Vaccination, Pre and Postnatal consultations in Nigeria

| Social Utilities | Gini Coefficient | Concentration Index | Difference | T-ratio | Remark |
|------------------------|------------------|---------------------|------------|----------|------------------------|
| Vaccination | 0.409 | 0.021 | -0.388 | -9.367* | Relatively Progressive |
| Prenatal Consultation | 0.378 | 0.170 | -0.208 | -11.382* | Relatively Progressive |
| Postnatal Consultation | 0.391 | 0.179 | -0.212 | -10.943* | Relatively Progressive |

Source: Authors' Computation Based on NBS (2004)

* It implies that the difference between the Concentration index and Gini coefficient is significant

5.3 Results and Discussions of Marginal Benefit Incidence of Public Spending on Vaccination, Pre- and Postnatal Consultations in Nigeria

The result of marginal benefit incidence analysis presented in Table 5 suggests that any commitment that result in 1% expansion in child vaccination, prenatal consultation and postnatal will lead to about 1.10%, 1.16%, 0.92%, increase in child vaccination, prenatal and postnatal consultation among the poorest income group respectively¹⁶. The same values for the richest income group are about 0.87%, 0.71% and 0.74%, for child vaccination, prenatal and postnatal consultation respectively. The table also reveals that the poorest group will benefit more than the richest group in expansion of child vaccination and prenatal consultation, while the poor and average income group will benefit more than the other income groups in the expansion of postnatal health care provisions.

The fact that expansion in child vaccination programme will benefit the poorest income group more than the richest income group may be due to the fact that the poorest income households tend to have more children than the richest income group; hence they may need this service than the richest income group. The positive effect of UNICEF vaccination campaign in Nigeria may explain the chances that the children from the poorest household are vaccinated. The campaign is being done in such a manner that the vaccinators target places where the children from the poorest income groups can be found, such as public schools and religious places of worship.

Table 5 reveals further that the poorest income group will benefit more than the richest income group in the expansion of prenatal consultation, while

¹⁶ The reverse can also apply here if there is a cut in the commitment. If there is any cut in commitment that results in 1% contraction in child vaccination, prenatal consultation, postnatal consultation, will lead to about 1.10%, 1.16% and 0.92% reduction in child vaccination, prenatal consultation and postnatal consultation among the poorest income group respectively.

the middle income group will benefit more in the case of postnatal consultations. Adekolu-John (1989) demonstrated that postnatal care was not a priority to the mothers (majority who are illiterate and poor) in Nigeria and not a priority even to the health care providers¹⁷. This may explain the fact that even if there is expansion in the provision of postnatal cares the poorest group will not benefit as much as the middle income group in the expansion, because the poorest group may not consider postnatal health care as a necessity, at least after safe child delivery.

The general observation about the marginal benefit incidence of public spending in Nigeria as presented in Table 5 is that the marginal benefit incidence is higher for the poorest income group in the health services in which the poorest income group has a high participation rates (this is the case for child vaccination and prenatal consultation), and the marginal benefit incidence is lower for the poorest income group in the health service in which the poorest income group has low participation rates (this the case for postnatal consultation). The poorest income participation rates in, child vaccination and prenatal consultation are 44% and 28% respectively, while the participation rate by the poorest income group in postnatal consultation is 12% as indicated in Table 5. In the case of postnatal consultation with lower participation rate among the poorest income group, its marginal benefit incidence among the poorest income group is equally lower (MBI =0.9179) as compared with the marginal benefit incidence for child vaccination (MBI =1.0963) and prenatal consultation (MBI = 1.1633). So, initial accessibility rate to health service by the poor may determine whether the poor will benefit more or less from the expansion of that health service. This finding is in consonance with result of marginal benefit incidence estimated by Ajwad and Wodon (2003; 2007). They indicated that although there are important differences between marginal benefit incidence for different types of services, and that in many cases marginal benefit incidence tends to be more pro-poor than benefit incidence, especially once the non-poor already have high levels of access. By contrast,

¹⁷ In some health care centers, prenatal consultation is free of charge, whereas postnatal consultation is not.

when access rates are relatively low, they suggested that special efforts may be needed to ensure that the poor benefit from future increases in access.

Table 5: Marginal Benefit Incidence of Public Spending on Vaccination, Pre and Postnatal Consultations in Nigeria

| Social Utilities | Poorest | Poor | Average | Rich | Richest | Participation Rate by the Poorest Quintile (%) |
|------------------------|---------|--------|---------|--------|---------|--|
| Vaccination | 1.0963 | 0.9267 | 1.3590 | 0.7148 | 0.8732 | 44 |
| Prenatal Consultation | 1.1633 | 1.1003 | 1.0280 | 1.9996 | 0.7088 | 28 |
| Postnatal Consultation | 0.9179 | 1.2438 | 1.1693 | 0.9256 | 0.7433 | 12 |

Source: Authors' Computation Based on NBS (2004)

6.0 Conclusions and Policy Recommendations

Generally, the spending on health service in Nigeria is not pro-poor. There is marked disparity between accessibility to the health services in the rural and urban areas, with urban area having more than 50 percent of the share of the spending on the health services considered in this study. There are also regional inequalities in the share of these services. South has more share of the spending on child vaccination than the North, while the North has more share of the spending on prenatal and postnatal consultation than the South.

Marginal benefit of incidence of spending on health services in Nigeria indicates that the poorest group will benefit more on the health service in which their current participation (accessibility) rate is high. This is the case for child vaccination and prenatal consultation. In the case of postnatal consultation with lower participation rate among the poorest income group, it marginal

benefit incidence among the poorest income group is equally lower (MBI = 0.9179) as compared with the marginal benefit incidence for child vaccination (MBI = 1.0963) and prenatal consultation (MBI = 1.1633).

From this study, the following recommendations can be made. Generally, there is a need for pro-poor policies in order to accelerate the speed at which the poor benefit more from increases in access to health services in Nigeria:

Better Health for All Nigerians (2010) asserted that Government's responsibility for health in Nigeria is shared between the three tiers of government without any clear legal division as to who does what. So for effective implementation of health policy that will be of benefit to the poor, there must be clear demarcation of the legal responsibility of each tier of Government. Because of the importance of primary health (Primary Health Care is much more effective in preventing and treating 90% of the health problems in Nigeria), the federal government and local government can be financially and legally charged to take responsibility of primary health care provision.

The Nigerian Government at all levels spends less than 5% of public expenditure on health, despite being signatory to the 2000 Abuja Declaration to increase this to 15%. In 2004 the current civilian regime launched an ambitious programme of "Health Sector Reform". This is designed to reform the national health system and thereby improve the health status of all Nigerians. There is a draft National Health Bill before the National Assembly, which is yet to be passed. This defines the roles and responsibilities of tiers of government, establishes a fund for Primary Health Care, and sets out a minimum package of health for all citizens. The passage of the bill will improve funding to the primary health care which is very low at the moment (according to World Bank (2005) capital expenditure on health in Nigeria is US\$9.44, which is very low compared with a number of comparable economies). The implementation of the National Health Bill will also enhance the effectiveness and efficiency of health care provision and improve the health indices in Nigeria (Nigeria still has one of the worst records on health indices in the world and sadly accounts for 10% of the world's maternal deaths in child birth whereas

the country represents 2% of the world population).

Nigeria should increase her per capita spending on health from 9.44 USD to at least 34 USD as recommended by the World Health Organisation (WHO). Towards this, all levels of governments, Federal, State and local should increase budgetary allocation to Health to at least 15% and publish such budget for proper monitoring by the people. This extra funding will be used to put in place a special system of social welfare focusing on providing safety nets and free medical services for the disadvantaged or vulnerable groups including pregnant women, children under 5 years of age, the aged and poor. The budget should also be restructured in the favour of the primary health care provision. A situation where about 69% of Nigeria's health budget is spent on tertiary care is not pro-poor. The spending should also be re-aligned in the favour of the rural area. As at the moment, 70 percentage of Nigeria's health budget is spent in urban areas where 30% of the population resides and 30 percent spent in rural areas where 70 percent of the people resides (Vital Facts on Health Care in Nigeria, 2010). The regional disparities can be bridged by increasing expansion to child vaccination programmes in the Northern part of Nigeria, while more resources are devoted to expand accessibility to prenatal, postnatal healthcare consultations in the South.

The current health insurance policy should be designed to include the poorest income group so that they can benefit from the programme. An health insurance programme which exclude the self employed workers as currently being done in Nigeria cannot be said to be pro-poor.

Civil society should ensure that it continues advocacy towards increasing budgetary allocation to health by all governments to at least 15%. They should advocate to elected officers to account for their stewardship especially in the area of health care funding. Non Governmental Organizations should also be active in educating and enlightening the populace on the importance of preventive health care in Nigeria.

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ANNEXES

Annex Table 1: Comparison of Social Indicators in Nigeria with Low Income Countries

| Indicators | Nigeria | Low Income Countries |
|---|---------|----------------------|
| Improved Sanitation (% of Urban Population with Access) | 53 | 61 |
| Access to Safe Water (% of Population) | 62 | 76 |
| Immunisation, Measles (% of Children ages 12-23 months) | 35 | 63 |
| Infant Mortality rate (Per 1000 Live Births) | 101.4 | 79 |
| Under Five Mortality (per 1000) | 196.6 | 122 |

Source: Computed from Okonjo-Iweala and Osafo-Kwaako (2007).

Annex Table 2: Progress in Health MDG related goals in Nigeria 1990 and 2007

| Indicators | Nigeria | | Sub-Sahara | |
|---|---------|-------|------------|------|
| | 1990 | 2007 | 1990 | 2007 |
| Immunization against measles (percentage of children ages 12-23 months) | 54 | 35 | 56 | 73 |
| Mortality rate [infant (Per 1000 live births)] | 91 | 76 | 107 | 88 |
| Mortality rate [under 5 (per 1000)] | 230 | 194 | 183 | 145 |
| Maternal mortality (per 1000,000 live births) | 800 | 704 | 920 | 900 |
| Incidence of tuberculosis (per 100,000 people) | 106 | 282.6 | 150 | 234 |
| Improved sanitation facilities (% of population with access) | 39 | 44 | 26 | 42 |
| Improved water source (% of population with access) | 49 | 48 | 49 | 58 |
| Fertility rate (births per woman) | 6.7 | 5.5 | - | - |
| Contraceptive prevalence (% of women ages 15- | 6 | 13 | 12 | 21.5 |

| | | | | |
|--|------|------|-----|-----|
| 49) | | | | |
| Life expectancy at birth (years) | 46.4 | 43.0 | - | - |
| HIV prevalence (% 15-49 years) | 1.8 | 4.4 | 2.1 | 4.9 |
| Birth attended by skilled health staff (%) | 30.8 | 35.2 | 42 | 44 |

Sources: Alabi and Adams (2010)

Annex Table 3: Nigeria's Targets and Achievements in 2007

| Indicator | Target | Achievement |
|--|--------|-------------|
| Infant Mortality (per 1000 live birth) | 55 | 76 |
| Children Fully Immunised (%) | 100 | 70 |
| Maternal Mortality (per 100000 live birth) | 800 | 1000 |
| Life Expectancy (Years) | 60 | 43 |
| Population per Doctor (persons) | 300 | 4722 |

Sources: Computed from CBN Annual Reports and Statement of Account, 2008

Annex Table 4: Incidence of Government Spending on Health in Some Selected Developing Countries

| Country | Lower Health Level | | | Hospital Level | | |
|---|--------------------|----------|------------------|------------------|----------|------------------|
| | Poorest Quintile | Quintile | Richest Quintile | Poorest Quintile | Quintile | Richest Quintile |
| Ghana(1992) | 10 | | 13 | 31 | | 35 |
| Bulgaria (1995) | 16 | | 11 | 21 | | 27 |
| Vietnam (1993) | 20 | | 09 | 10 | | 39 |
| Global Mean for Developing Countries (1999) | 21.3 | | 15.8 | 12.5 | | 17.6 |

Sources: Djindil et al. (2007); Demery (2000)

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