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Analysis Of Senegal's Health Financing System: Implications For Health Financing Reform And Universal Health Coverage

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An abstract of a thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of

Master of Public Health
In Global Health
2014

Abstract

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Soukeyna Sylla

Senegal officially launched its Universal Health Coverage (UHC) Program in 2013. Prior reforms aimed at extending coverage to unreached sectors of the population have primarily targeted seniors above the age of 60 and pregnant women for caesarian care. This thesis analyzes National Health Accounts and population-level data to assess the extent to which coverage extension strategies have had an impact on population health coverage and household out-of-pocket spending over time. Results suggest that even after the introduction of coverage extension schemes in 2005 and 2006, there has been limited impact on overall population coverage. In fact, Senegal's health financing system continues to cover primarily formal sector workers, leaving the informal sector largely unaccounted for. Further, households continue to be the primary payers of health services, second to the Ministry of Health, suggesting that other payers within the system have not supplanted the burden of costs on households. Ultimately, the success of Senegal's UHC program rests on the ability to implement data-driven financing reforms that would ensure the new extension strategies embedded in the UHC program lead to substantial impacts on population coverage and health outcomes. The following health financing reforms are recommended: compulsory enrollment in a minimum package of services, regulation for the cost of the package among all public health providers, and improvement of supply-side financing through case-based payments.

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Acknowledgements

First, I want to thank Deb McFarland for her unwavering support and guidance all throughout my two years at Rollins. More than an educator and an advisor, she has been a mentor, generous with her time and her rich experience. This thesis is a testament to everything you have taught me, as well as the values you instill in all those lucky enough to cross your path.

Thank you to Paul Weiss for taking the time to think through the data and method of analysis with me, in spite of your many demands and obligations. Your help and encouragement throughout this analysis were invaluable and gave me an opportunity to get to know you outside of the classroom, and to appreciate you all the more.

Thank you to my colleagues and friends at the Senegalese Ministry of Health and beyond. This thesis would not have been possible without the data, information and time you so kindly put at my disposal.

Lastly, I would like to thank my family and loved ones for always providing motivation and strength in moments of doubts and uncertainty. Thank you for your patience and willingness to take this journey with me.

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CHAPTER I: INTRODUCTION

1. Context and Rationale

The ability to provide coverage for basic health services to all citizens remains a significant challenge in virtually every country. In low-to-middle income countries, limited resources, large informal sectors, and weak tax collection systems exacerbate this difficulty and governments are unable to adequately finance their health sectors (Lagomarsino, Garabrant, Adyas, Muga, & Otoo, 2012).

In the 1980's, user fees were introduced as a means to help finance the healthcare sectors of low-middle income countries (Robert, 2013). After the implementation of this new financing mechanism in countries in Sub-Saharan Africa, Asia and Latin America, studies were conducted throughout the 1990's to evaluate the effectiveness of user payment at points of service delivery. But the findings resulted in a growing consensus among global health actors that user fees fall short of covering a significant share of health sector costs (Robert, 2013). Moreover, they disproportionately affect the poor and most vulnerable for whom the fees can become a significant barrier to access health services. In the first decade of the 21st century, governments began to enact policies to abolish user fees for access to basic health services.

Still the issue of health sector financing persists and a significant portion of health care costs continue to fall heavily on households, causing them to face greater out-of-pocket expenditures at service delivery points. For households in fragile economic situations, these out-of-pocket expenses represent a financial burden that often drives them into greater economic hardship and can lead to poorer health outcomes as a result of the lack of access to care (Moreno-Serra & Smith, 2012).

The social and economic costs resulting from the absence of health coverage and governments' inability to finance the cost of health care have, within the last decade, placed

the objective of universal health coverage at the forefront of the public health agenda (WHO, 2005).

2. Problem Statement

The World Health Organization (WHO) classifies health financing as one of the six essential building blocks of a well functioning health system (WHO, 2010a): health financing, health service delivery, health workforce, health information systems, access to essential medicines, and leadership and governance. The aim of this study is to position health financing, and the health expenditure data on which health reforms should to be based, as central to the proper functioning of the other five health systems components. Country-level policies designed to strengthen health systems ought to be predicated on innovative health sector financing and the adequate allocation of the resources generated.

The geographic focus of this thesis is Senegal. Senegal's health financing system is not only complex and fragmented, but also fails to provide a sufficient level of population coverage, last estimated in 2007 at 20.13% (Ministère de la Santé et de la Prévention, 2010). The current schemes and payers largely favor formal sector workers, leaving workers in the informal sector and the unemployed without insurance and unable to cover their health care needs. Even when care is available, individuals are faced with the challenge of high and unregulated costs. These costs vary from public to private providers, and are also reflected in the quality of care given. There is a general perception that private providers are more efficient and provide better quality care than public providers, but a study conducted by Bitran et al. in Senegal revealed that the private sector is in fact highly heterogeneous in terms of efficiency and quality (Bitran, 1995). Only a specific group of providers – Catholic health posts – "were shown to be more efficient than public and other private facilities in the provision of curative and preventive ambulatory services at high levels of outputs" (Bitran, 1995).

Following a policy initiated in 2004, the Senegalese government made a commitment in 2012 to reach universal health coverage (UHC) (Ministère de la Santé, 2004). In September 2013, President Macky Sall launched the Universal Health Coverage Program, centered around four main strategies: reform the social health insurance organizations (IPM, Institutions de Prévoyance Maladie) that cover formal sector employees and their families; use community-based health insurance organizations to provide basic coverage to informal and rural sector workers; strengthen existing policies that exempt the elderly and pregnant women from paying for health care; and implement a new policy that will provide free care for children under five years of age (Abt, 2013b).

While the launch of UHC denotes strong political will, there is no indication that the identified strategies are evidenced-based, and further, that they will be sufficient to meet the goal of universal health coverage. In fact, there is a significant gap in knowledge regarding the extent to which the existing financing schemes have been an efficient use of resources, have led to a positive change in population coverage over time, and further, are strong enough to sustain the strategies put forth in the UHC program.

These current health sector-financing strategies are at the core of the new UHC program, and hence require solid evaluation so as to prevent important resources from being wasted and objectives from being missed. It is essential that policymakers ground reforms for UHC in reliable data pertaining to health expenditure, health service utilization, and insurance coverage levels.

Anticipation of the post-2015 Millennium Development Goals (MDG) has resulted in an increasing sense of urgency for countries to address universal health coverage through health financing reform and health system strengthening. The success of Senegal's UHC program rests heavily on the willingness and ability of local health actors to evaluate the country's health financing system. Doing so will help determine whether the resources that

have so far been allocated to health have been efficiently used, and provide credible information on population coverage and service usage. Lastly, the evaluation will ensure that the strategies for UHC are not only aimed at reaching the informal sector and the unemployed, but also allow corrections to the existing system, such as the need to regulate and standardize health costs and pool available funds in a more efficient manner.

3. Purpose of Project

The purpose of this thesis is to determine the extent to which Senegal's health financing system has succeeded in reducing the burden of health care costs on households by evaluating the existing payer system. The objective is to measure population level health insurance coverage within each payer system, as well as changes in out-of-pocket expenditures over time. Specific research questions are:

1. What levels of coverage can Senegal's current financing system guarantee?
2. Which populations are currently covered under this system?
3. How have levels in population coverage changed, if at all, after the introduction of strategies designed to extend coverage to unreached sectors of the population?
4. Have these strategies been effective?
5. Has the burden of health care costs on households decreased over time and been supplanted by other payers?
6. Is there a need, in spite of these efforts, to find alternative pathways that include pro-poor reforms towards UHC?

4. Significance of Project

Senegal's efforts to attain universal health coverage for all cannot be successful without prior evaluation and corrections of the existing financing system. This analysis will contribute to policy recommendations intended to strengthen Senegal's UHC program.

While the focus of the study is Senegal, it can serve as good example that could be applied to other countries dedicated to use evidence as the way to inform policy in health.

5. Definition of Terms

- **Adverse selection**: the tendency of higher-risk individuals to be more likely to enroll in insurance. In the case of health insurance, occurs when more people with high expected health costs elect to enroll than do those with low expected costs (The World Bank, 2012).
- **Formal sector workers**: workers in this employment sector have regular hours and are paid wages or salaries on which they must pay income taxes (The World Bank, 2012).
- **Government health expenditure**: current and capital spending from government (central and local) budgets, external borrowings, and grants (including donations from international agencies and nongovernmental organizations, and social (or compulsory) health insurance funds (The World Bank, 2014b).
- **Health financing**: refers to the methods used to mobilize the resources that support basic public health programs, provide access to basic health services, and configure health service delivery systems (Schieber and Akido 1997) (HS 20/20)
- **Health financing system**: consists of the payers, providers, and consumers of health services and the policies and regulations that regulate their behavior
- **Health insurance**: formal arrangement in which insured persons (beneficiaries) are protected from the costs of medical services that are covered by the health insurance plan (the benefits) (The World Bank, 2012).
- **Health system strengthening**: any array of initiatives and strategies that improves one or more of the functions of the health system and that leads to better health through improvements in access, coverage, quality, and efficiency (Health Systems Action Network 2006) (HS 20/20)

- **Informal sector workers**: refers to workers not employed in the formal sector and whose economic activity tends to be irregular (The World Bank, 2012).
- **Household out-of-pocket expenditure**: direct outlay by households, including gratuities and in-kind payments to health practitioners and suppliers of pharmaceuticals, therapeutic appliances, and other goods and services whose primary intent is to contribute to the restoration or enhancement of the health status of individual or population groups (The World Bank, 2014d).
- **Moral hazard**: occurs when the behavior of an insured person changes, usually to become less risk-averse, because they no longer bear the full cost of their behavior (The World Bank, 2012).
- **Universal Health Coverage (UHC)**: the goal of UHC is to ensure that all people obtain the health services they need without suffering financial hardship when they pay for them. For a community or country to achieve UHC, several factors must be in place including: 1) a strong, efficient, and well-run health system that meets priority health needs through people-centered integrated care 2) affordability- a system for financing health services so people do not suffer financial hardship when using them 3) access to essential medicines and technologies to diagnose and treat medical problems 4) a sufficient capacity of well-trained, motivated health workers to provide the services to meet patients' needs based on the best available evidence. It also requires recognition of the critical role played by all sectors in assuring human health, including transport, education and urban planning (World Health Organization, 2012).

CHAPTER II: LITERATURE REVIEW

The review begins by presenting the state of health care and the overall health care system in Senegal. This will highlight the main health system's issues that are important to consider in our analysis. We discuss the functions of health financing, paying special attention to strategies and obstacles, broadly applied to low-middle income countries. We will then present Senegal's health financing system, its organization, the actors involved and its current financing mechanisms. Lastly, we present post-implementation results of Ghana's national health insurance and consider implications for Senegal.

1. The Senegalese Health Care System

The organization of the Senegalese health care system follows a pyramidal structure comprised of three levels: peripheral, intermediary and central (Ministère de la Santé et de la Prévention, 2009). At the peripheral level, individuals have access to primary health care, including health education and basic preventive and curative services. This peripheral level is comprised of a network of health posts and rural maternities, some of which can also offer dental care services (Ministère de la Santé et de la Prévention, 2009). The health facilities at the peripheral level fall under the supervision and control of health districts.

The intermediary level is organized around medical regions that have the same jurisdiction and reach as administrative regions (see Map 1 in Appendix). These medical regions are responsible for the coordination, supervision and control of all public and private facilities within their boundaries (Ministère de la Santé et de la Prévention, 2009). At this level, populations can access health centers where all primary care and some specialized care, such as general surgery, are offered (Ministère de la Santé et de la Prévention, 2009).

The Ministry of Health and its services manage the central level, where specialized care is offered in reference and teaching hospitals. Level 3 hospitals offer specialized surgical and

medical care, while general surgery and obstetric care are available at level 2 hospitals (Ministère de la Santé et de la Prévention, 2009).

It is essential to note the importance of the private sector in the context of the Senegalese health system. Even though private health care facilities are present at every level of the pyramidal structure, there is no equivalence between the services and technologies available in the public and private sector. The private sector plays a significant role in the delivery of health care, however it shares no formal collaborative framework with the public sector. Still it would appear that both the rich and the poor access facilities in the private sector, thus increasing its impact on national health indicators (Ministère de la Santé et de la Prévention, 2009).

Another essential element of the Senegalese health system is the role played by traditional medicine. Efforts have been made to inventory traditional healers, create centers dedicated to experimentation in plant-based medicines, and incorporate traditional medicine in the national health system (Ministère de la Santé et de la Prévention, 2009). However there have been a number of obstacles to these efforts, mainly the lack of consensus around the definition and scope of traditional medicine.

2. The Functions of Health Financing

There are three key health-financing functions: collecting revenue, pooling risk, and purchasing services (Gottret, 2006). It is important to understand the connection between these functions as we consider the status and future of health financing in Senegal. This is because the factors that primarily hinder progress towards universal health coverage in low-middle income countries are related to a country's ability to generate revenue, pool risk and pay for services.

"*Revenue collection is the way health systems raise money from households, businesses, and external sources. Pooling deals with the accumulation and management*

of revenues so that members of the pool share collective health risks, thereby protecting individual pool members from large, unpredictable health expenditures. Prepayment allows pool members to pay for average expected costs in advance, relieving them of uncertainty and ensuring compensation should a loss occur." (Gottret, 2006) P.46

For governments in low-middle income countries, the process of generating revenue to finance public health services is largely affected by fiscal issues (Gottret, 2006) and weak taxation systems. Limited government resources in these countries have resulted in consistently low amount of government health expenditure as a percentage of GDP (gross domestic product). Even though the correlation between government health expenditure and a country's income classification is not always a positive one, Savedoff et al. argue that increasing government spending on health would ultimately increase health sector incomes and expand the range of available services. But "whether this increased spending contributes to wider access to necessary health care depends on political action to pool financing and establish mechanisms to spend efficiently and equitably" (Savedoff, de Ferranti, Smith, & Fan, 2012), or in other words, on efficient risk pooling and purchase of health services.

In order to pool resources to the greatest extent possible, systems of taxation and premiums, which take into account individuals' income levels, must be implemented to eliminate payments at points of service delivery. But risk pooling is often hindered by fragmentation in the health systems of many low-middle income countries. In fact, multiple funding mechanisms provide healthcare for different socioeconomic groups, posing significant issues of equity. Ultimately, "fragmentation reduces the possibilities for income and risk cross-subsidization in the overall health system" (McIntyre, 2008).

Purchasing, also referred to as "financing of the supply side, includes the numerous arrangements used by purchasers of health care services to pay medical care providers"

(Gottret, 2006). Some of the most complex arrangements often pose operational difficulties related to cost and implementation within an already fragile health system.

3. The Senegalese Health Financing System

The Senegalese health financing system, shown in Table 1 below, can be described as fragmented, complex, and inequitable given its multiple pooling mechanisms. It is made up of an array of different funds and payer mechanisms, which mostly provide coverage to employees and retirees in the formal public and private sectors and guarantees them access to basic services. Otherwise, only individuals who can afford to pay out of pocket can access care when they are not covered by health insurance.

Table 1: Inventory Of Senegal's Health Insurance Schemes And Beneficiaries

	GOVERNMENT COVERED EMPLOYEES	PRIVATE SECTOR EMPLOYEES	PRIVATE SECTOR RETIREES	-	-	SENIORS ABOVE 65 YEARS
PAYER/ SCHEME	**Government Budget**	**IPM**	**IPRES**	**Mutuelles**	**Insurance Firms**	**Plan Sésame**
ENROLLMENT	Automatic	Automatic	Automatic	Voluntary	Voluntary	Automatic (with card)
TYPE OF COVERAGE	Basic	Basic	Basic	Basic or Supplementary	Basic or Supplementary	Basic or Supplementary
MEDICAL CARE	80% coverage	40-80% coverage	Free in-network	Negotiated with health centers & posts	-	100% coverage
PRESCRIPTION DRUGS	Not covered	Generic & some brand name	-	Generic & some brand name	-	-

Source: Sénégal, L'analyse des prestations et des indicateurs de résultats de la protection sociale (Annycke, 2008)

The government automatically covers civil servants and public sector employees (Annycke, 2008; Ministère de la Santé et de la Prévention, 2010) . Every year, a budget line is allotted to cover all civil servants, public employees and their families. There are no employee contributions for this category (Annycke, 2008).

The two payers, IPM (Institut de Prévoyance Maladie) and IPRES (Institut de Prévoyance Retraite du Sénégal) provide coverage for private sector employees, retirees and their families. Coverage under IPM, for private sector employees, is funded by a 3%

employer and a 3% employee contribution (Annycke, 2008; Ministère de la Santé et de la Prévention, 2010). IPRES is very similar to the Medicare system in the US, in that private employees are entitled to coverage after retirement through employer/employee contributions made during their period of activity. Retirees used to contribute 1% of their pensions to IPRES, but this obligation is no longer enforced (Annycke, 2008).

Mutuelles, or community-based health insurances, are private entities that provide coverage on the basis of monthly or annual premiums. Plans and premiums vary by mutuelles, but coverage for primary care is most commonly offered (Ministère de la Santé et de la Prévention, 2010). It is not uncommon to see billboards or receive brochures from mutuelles advertising their most competitive plans. Although the coverage plans offered are less expensive than those offered by private health insurances, the premiums are still considered costly for the average family (Annycke, 2008). Most mutuelles operate independently and therefore have no obligation to standardize costs or benefits. Thus there is no reliable data on the average amount a family pays. In some instances, mutuelles operating in similar areas will group in associations, resulting in numerous associations of mutuelles (Annycke, 2008).

Public sector employees often purchase supplementary plans with mutuelles to help cover the remaining 20% of medical care not covered by the government (Annycke, 2008; Ministère de la Santé et de la Prévention, 2010). They pay a minimum monthly premium of 3,800 FCFA (7,76 USD), which varies according to the pay grade and family size of the enrollee (Annycke, 2008).

Private insurance plans are the most costly. Beneficiaries of these plans are mostly corporate executives and professionals who pay monthly premiums (Annycke, 2008; Ministère de la Santé et de la Prévention, 2010). Data on average premium cost for these

plans was not found. It is estimated that only 70,000 people (or 1% of population in 2008) were covered by private insurance in Senegal (Annycke, 2008).

Lastly, the 'Plan Sésame', initiated in 2006, is a government-run program funded through taxes that provides 100% medical care coverage for seniors 65 (or 60 according to the MoH in its national extension strategy) years and over, regardless of prior professional activity (Annycke, 2008; Ministère de la Santé et de la Prévention, 2010). Through this initiative, seniors can access care (including consultations, prescription drugs, laboratory exams and imagery) at any public health facility with their membership card (Ministère de la Santé et de la Prévention, 2010). It also allows public sector retirees to have coverage for the 20% of medical care not covered under their government pensions and benefits (Annycke, 2008).

'Plan Sésame' was not the government's first attempt to finance access to basic services for targeted groups. In fact it was preceded in 2005 by the introduction of the 'free delivery and caesarian policy (FDCP)' (Witter, 2010). The initiative was first piloted in five regions, and extended in 2006 to all regional hospitals, with the exception of those in the region of Dakar. No explanation was given in the MoH extension strategy as to why Dakar was not included (Ministère de la Santé et de la Prévention, 2010), but we assume it is likely related to the region's high population density in comparison to all the other regions.

In order to evaluate the impact of the policy, data was collected retrospectively from six districts within the five pilot regions before policy implementation in 2004, and after in 2006 (Witter, 2010). Researchers collected both qualitative and quantitative data. Key informant interviews, focus group discussions and in-depth interviews were thematically analyzed, financial data on expenditure was analyzed using Excel, and clinical data of major obstetric intervention were analyzed using EpiInfo, SPSS and Excel (Witter, 2010).

The study found that there were increases in utilization for normal deliveries (from 40% to 44%) and in caesarian rates (from 4.2% to 5.6%) in FDCP areas compared to non-FDCP areas (Witter, 2010). However there were also "significant implementation difficulties, including allocating resources according to need, making timely transfers to facilities, and transferring funds to lower level facilities to adequately compensate them for lost revenues" (Witter, 2010). Senegal's FDCP policy has the potential to increase access to obstetric care but scale up necessitates "improved systems for planning and allocating resources, and new channels to reimburse lower level facilities" (Witter, 2010). The authors also argued that the policy should cover all complicated deliveries and not just cesareans.

This study by Witter et al. demonstrates the importance of evaluating the health financing mechanisms that are at the basis of health policies. It suggests that while there may be an immediate improvement in health access and care after the implementation of a policy, weak links in financing structure can jeopardize its financial and operational sustainability.

4. Ghana's National Health Insurance Scheme: What lessons learned?

Ghana introduced its National Health Insurance Scheme (NHIS) in 2003, with the long-term goal to cover all of its citizens within five years (Escobar, 2010). Formal sector workers contribute with a 2.5% payroll deduction. Individuals employed outside the formal sector pay premiums. Premiums were initially meant to vary based on income, but in reality, a flat premium is charged per year due to the "difficulty of categorizing people into different socioeconomic groups" (McIntyre, 2008).

In Ghana, multiple risk pools operate within a network of 138 District Mutual Health Insurances (DMHI). The National Health Insurance, at the central level, plays two roles. For one, it allocates prepaid revenues to the district pools, based on the number of registered members and indigent. Secondly, it covers its members, the majority of which are from higher income groups (McIntyre, 2008).

In 2004, a study was initiated in two districts (Nkoranza and Offinso) to evaluate the effect of the NHIS on population health coverage, use of health care services and household out-of-pocket expenditures (Escobar, 2010). Investigators conducted a baseline household survey in September 2004 (before NHIS implementation) and an endline survey in September 2007. The surveys collected information on: "health insurance membership, health care use, payments associated with injury or illness in the two weeks prior to the survey, hospitalization in the 12 months prior to the survey, and delivery in the 12 months prior to the survey" (Escobar, 2010).

The study found that initially, 23% of individuals in the sample were enrolled in a community-based health insurance (CBHI). After introduction of the NHIS, population health coverage increased significantly, but enrollment was not equitable across income groups: "52% of those in the top wealth quintile were enrolled in the NHIS, compared with 18% in the poorest quintile" (Escobar, 2010). Further, the results showed that enrollment was more likely among females, individuals with chronic illness, and individuals living in a house headed by a female or living in a household participating in a community solidarity group.

Evidence of adverse selection was also found: 55% of individuals with a reported chronic illness in both study sites were enrolled in NHIS, compared to 34% of those who did not report a chronic illness ($p<0.01$) (Escobar, 2010). Using multivariate regression on the pooled pre-post data, results showed that the "proportion who sought care from a modern provider nearly doubled, from 37% at baseline to 70% at endline ($p<0.01$)" (Escobar, 2010). Meanwhile, the proportion of individuals seeking care from an informal providers, or self-treating at home, decreased from 76% to 44% ($p<0.01$).

In addition, the likelihood of incurring out-of-pocket expenditure reduced substantially. "At baseline, 87% of the ill/injured incurred out-of-pocket spending on treatment, compared with only 57% at endline ($p<0.01$)" (Escobar, 2010). Similarly, the

proportion of women who incurred out-of-pocket spending for maternal care also dropped from 88% to 55% ($p<0.01$). However, there was no significant change in the "proportion of women who had at least four prenatal care visits, delivered in a health facility, or delivered by Caesarean section" (Escobar, 2010).

The analysis of Ghana's NHIS implementation has important ramifications for Senegal's UHC program. Both countries share similarities in terms of the organization of their health systems and the role played by mutuelles or CBHI. As Senegal launches its coverage extension strategy, it must anticipate ways of tackling the issues of equitable enrollment, adverse selection and the increase in the demand for health services so as to maximize potentially positive impacts on financial protection.

5. Summary of Current Problem and Project Relevance

The question of whether Senegal's health financing system has the robustness and efficiency to sustain the strategies defined in its UHC program is critical as plans for universal coverage unfold. This research into and analysis of the country's payer system is one answer to the many recommendations regarding the need for better planning, allocation and disbursement of health-related resources within the health system (Alenda J., 2012; Witter, 2010). The ultimate goal is to identify the major health financing gaps, and propose ways to resolve them by suggesting strong and feasible financing mechanisms for the country's ambitious UHC program.

CHAPTER III: METHODOLOGY

This research was conducted using National Health Account data, collected between 2006 and 2009 by the Ministry of Health/CAFSP (Cellule d'Appui au Financement de la Santé et au Partenariat) and its technical partner, the National Statistics and Demography Agency (ANSD, Agence Nationale de la Statistique et de la Démographie). The NHA data was used to describe and assess the national payer system from 2005 to 2007. This was supplemented by a Ministry of Finance database that provided additional information regarding the civil servants category. Lastly, we accessed national data sources and reports to assess population level health coverage from 2005 to 2011. Table 2 below summarizes the sources used and the dates covered for each source. They are described in greater detail in this chapter.

Table 2: Data sources used and dates covered for each source

	Dates Covered	
	Start	**End**
National Health Accounts Database	2005	2007
Ministry of Finance Civil Servants Database	2005	2010
Ministry of Health Projected Coverage Data	2007	2011
Population-Level Data Sources & Reports	2005	2011

1. Population and Sample

Data collection for the country's first round of NHA began in November 2006, at which point 2005 financing data were available (Ministère de la Santé de la Prévention et de l'Hygiène Publique, 2009).

In 2005, Senegal had an estimated population of 10,901,434, with one fourth of the total population living in the region of Dakar. According to 2002 Census data, 42.8% of the population was less than 15 years old, 54.7% were less than 20 years old and only 3.5% were 65 or older (Ministère de la Santé de la Prévention et de l'Hygiène Publique, 2009).

While the economic growth rate was, on average, greater than 5% in the 2000 to 2005 period, Senegal remained a poor country with an estimated GDP per capita of 799 US Dollars. It was estimated that 52% of households were living in poverty (Ministère de la Santé de la Prévention et de l'Hygiène Publique, 2009).

In 2005, Senegal's public health system was made up of the following providers: 20 public hospitals, 60 health centers, 579 fully functional health posts, 234 health posts without a maternity, and 16 maternities, covering the country's 11 regions (Ministère de la Santé de la Prévention et de l'Hygiène Publique, 2009). The market for private health care providers was also thriving and counted 1 not-for-profit private hospital, 34 private clinics, 194 general practices, 210 specialized practices, 142 dental offices, 585 nursing practices and 83 catholic health posts (Ministère de la Santé de la Prévention et de l'Hygiène Publique, 2009).

National Health Accounts aim to provide a comprehensive picture of all health-related funding sources and expenses in a given period. As such the NHA captures information from public and private payers, donors, employers, but also citizens and foreign nationals residing in Senegal between 2005 and 2007.

2. Research Design

The NHA data was collected using a non-experimental, longitudinal approach that utilized financial reports and targeted questionnaires. Every year, the financial reports were obtained and the questionnaires administered to the same entities, over a period of three years, beginning in 2006. In 2006, financing data for 2005 was available. The data was analyzed and reported in 2009 after the financing data for 2007 was obtained in 2008. The resulting NHA tables represent Senegal's health financing information from 2005 to 2007.

The data on civil servants compiled staff and salary information from 1999 to 2010. Salary information includes both base salaries and compensations, while information on staff

pertains to civil servants that work for the central administration. The data was presented using Excel and posted on the Ministry of Finance's Economics and Forecast Direction.

In May 2008, the Ministry of Health/CAFSP finalized a working document describing the national health coverage extension strategy, comprised of three axes (Ministère de la Santé et de la Prévention, 2008):

- Improve coordination and scale-up of user fees exempt policies through the creation of a centralized fund;
- Strengthen existing capacities and increase the reach of mutuelles, IPMs and user fee exempt policies;
- Create new schemes specific to groups like rural informal sector workers (i.e. farmers, cattlemen) and truckers using mutuelles as payers.

Still the most salient feature of this document was the projected increases in population health coverage from 2007 to 2012. These projections, broken down into different socio-economic groups, illustrate how population health coverage is expected to change over time as the extension strategy is implemented. The 2007 numbers were confirmed MOH estimates that were used as baseline for the subsequent projections.

3. Procedures

The first step of our research was to obtain the NHA data from the Senegalese Ministry of Health. Although the 18 original databases were no longer available, we were able to get the different questionnaires that were administered. While these did not contain actual data, the questionnaire provided the questions and information that was sought from each health entity.

The health expenditure data contained in the NHA database highlighted the need to obtain information on population health coverage as a metric for effective health spending. We thus set out to acquire population coverage data for the years of the NHA data collection

and the post-2008 period. We found a significant gap of information regarding estimates of the change in population coverage over time, broken down by schemes. However, we were able to obtain a Ministry of Health document containing projected estimates of population coverage, which covered both the NHA data collection years and the post-2008 period.

Since the coverage information we obtained were projected numbers based on 2007 estimates, we wanted to test the validity of the projections put forth by the MOH. Therefore the next step of our research was to acquire the necessary data that would allow us to calculate our own estimates of population coverage over time. We used country-level data sources and reports to estimate target populations and corresponding coverage levels within each scheme. For the civil servants category, we accessed data on the target population in a database obtained from the Ministry of Finance's Economics and Forecast Direction website.

4. Instruments

4.1 National Health Accounts database

The country's first NHA round collected both primary and secondary data. Secondary data was obtained from the financial reports of health facilities, ministries and local governments, as well as previous household surveys conducted by the national statistics agency (Ministère de la Santé de la Prévention et de l'Hygiène Publique, 2009).

Primary data was also collected directly from each of the different payers and providers by the use of targeted questionnaires. A total of 18 questionnaires were designed and administered to the following entities: ministries (centralized administration), local governments (decentralized administration), private insurance firms, social health insurance organizations (IPM), social security fund (IPRES, FGA), employers, donors, NGOs, private clinics, public hospitals, individual practices, traditional healers, research and training institutes, community insurances (mutuelles), Catholic health posts, health centers and health posts (Ministère de la Santé de la Prévention et de l'Hygiène Publique, 2009).

In order to assess household-level expenses at health facilities, data collectors accessed billing records of public and private providers and traditional healers. The information collected was crosschecked with the findings from two previous household surveys: l'Enquête Sénégalaise auprès des Ménages (ESAM II) and l'Enquête de Suivi de la Pauvreté au Sénégal (ESPS), both conducted by the national statistics agency (Ministère de la Santé de la Prévention et de l'Hygiène Publique, 2009).

The questionnaires were administered by either the designated NHA technical committee members or investigators hired by the national statistics agency. However in the case of hospitals and the social health insurance organizations (IPM), the questionnaires were self-administered (Ministère de la Santé de la Prévention et de l'Hygiène Publique, 2009). Table 3 below summarizes the data collection method for each entity targeted.

Table 3: Data Collection Method For Senegal's 2006-2008 NHA

Target	Number	Sampling Rate	Sample Size	Response Rate	Data Collection	Implementing Entity
Ministry of Health	1	100%	1	100%	External	Technical committee
Other ministries	30	100%	30	23%	External	Technical committee
Regions	11	100%	11	73%	External	ANSD investigators
Departments	67	100%	67	91%	External	ANSD investigators
Rural Communities	320	10%	94	89%	External	ANSD investigators
Social Security Fund	1	100%	1	100%	External	Technical committee
IPRES	1	100%	1	100%	External	Technical committee
IPM	92	100%	92	99%	External	ANSD investigators
IPM approfondi	91	33%	30	67%	Self-administered	Association of IPM managers
Mutuelles	115	100%	115	98%	External	GRAIM*
Insurance firms	12	100%	12	67%	External	Technical committee
FGA	1	100%	1	100%	External	Technical committee
Employers	50	100%	50	100%	External	CAFSP*
Public hospitals	18	100%	18	95%	Self-administered	Administrators
Private not-for-profit Hospital	1	100%	1	100%	Self-administered	Administrators
Private clinics	34	100%	34	68%	External	Technical committee
General practices	192	30%	59	100%	External	Technical committee
Specialized practices	210	40%	84	86%	External	ANSD investigators
Individual practices	585	17%	80	80%	External	ANSD investigators
Dental offices	142	50%	71	100%	External	ANSD investigators
Traditional healers	644	30%	195	100%	External	ANSD investigators
Donors	30	100%	30	70%	External	ANSD investigators/ Technical committee
NGOs	80	100%	80	57%	External	ANSD investigators/ Technical committee
Research institutes	24	100%	24	33%	External	ANSD investigators

**GRAIM: Groupe de Recherche et d'Appui aux Institutions Mutualistes*
**CAFSP: Cellule d'Appui au Financement de la Santé et au Partenariat*

Source: 2009 Report of Senegal's National Health Accounts (Ministère de la Santé de la Prévention et de l'Hygiène Publique, 2009)

The process of data collection yielded 18 databases, which were cleaned and entered in Epi-Info. The data was coded using the standard NHA nomenclature: one code for source of funds (FS), one for financing agents (HF), one for providers (HP) and one for services (HC) (Ministère de la Santé de la Prévention et de l'Hygiène Publique, 2009). Data analysis in Excel generated four 2X2 tables of the following NHA information:

- **Sources (FS) X Agents (HF)**, which traces the flow of funds from funding sources to the financing agents responsible for managing the funds;
- **Agents (HF) X Providers (HP)**, which traces the flow of funds from the different financing agents (or payers) to the different health providers;
- **Agents (HF) X Services (HC)**, which describes health expenditures made by the different financing agents detailed by type of service provided;
- **Providers (HP) X Services (HC)**, which describes the types of services offered by health providers in exchange for the funds received from their financing agents (or payers).

For the sake of our research, we considered the information contained in this dataset to constitute reliable data regarding the trends in national government expenditure for health over the given period.

4.2 Ministry of Health Projected Coverage data

In a 2008 institutional document describing the current state of health coverage in Senegal, projections were made regarding changes in population level coverage until 2012, using the last NHA year, 2007, as baseline. The projections were based on the successful implementation of the national coverage extension strategy presented in the document. We note that no information was found regarding the way in which these projections were calculated by Ministry of Health/CAFSP technicians, however we can assume that they were based on reliable country level data collected on demographics and socioeconomic indicators.

The data was presented in a table covering the 2007 to 2012 period (see Table 4 below), and gives the estimated number of persons covered within 10 target populations (civil servants, university students, local government officials, mutuelles enrollees, private insurance enrollees, truckers, rural workers, IPM enrollees, seniors aged 60 and above, children aged 0 to 5 years), as well as annual percentages of total population coverage.

Table 4: Projections of Population Coverage from MoH National Extension Strategy

	2007	2008	2009	2010	2011	2012
Civil Servants	817,193	841,708	866,960	892,968	919,757	947,350
Students (Higher Ed)	33,000	33,000	33,990	35,010	36,060	37,142
Local Government Officials	42,500	43,775	45,088	46,441	47,834	49,269
Mutuelles Enrollees	421,760	459,718	501,093	546,191	595,349	648,930
Private Insurance Enrollees	24,500	25,235	25,992	26,772	27,575	28,402
Truckers*	-	2,700	28,500	49,800	73,800	73,800
Rural Sector Workers*	-	18,295	61,729	262,765	1,112,982	1,112,982
Private Sector Workers (IPM)	400,000	412,000	420,000	440,000	460,000	480,000
Seniors 60+ years	555,690	572,361	589,532	607,217	625,434	644,197
Children aged 0-5 years**	-	-	2,426,683	2,499,483	2,574,467	2,651,702
TOTAL	**2,294,643**	**2,408,792**	**4,999,566**	**5,406,648**	**6,473,259**	**6,673,774**
% OF POPULATION COVERED	**20%**	**21%**	**42%**	**44%**	**51%**	**52%**

*Scheme not yet implemented
**Scheme implemented in 2014
Source: Stratégie d'Extension de la Couverture du Risque Maladie des Sénégalais, 2009

4.3 Population-Level Data Sources & Reports

The following documents were used to obtain estimates of target populations and calculate health coverage levels within each group:

1) Résultats Définitifs Du Troisième Recensement General De La Population Et De L'Habitat (RGPH) - 2002, National Statistics Agency, June 2008
2) Enquête de Suivi de la Pauvreté au Sénégal (ESPS)- 2005-2006, National Statistics Agency, August 2007
3) Situation Economique et Sociale du Sénégal - 2005, National Statistics Agency, updated February 2007

4) Situation Economique et Sociale du Sénégal - 2006, National Statistics Agency
5) Situation Economique et Sociale du Sénégal - 2007, National Statistics Agency, October 2008
6) Situation Economique et Sociale du Sénégal - 2008, National Statistics Agency, November 2009
7) Situation Economique et Sociale du Sénégal - 2009, National Statistics Agency, December 2010
8) Situation Economique et Sociale du Sénégal - 2010, National Statistics Agency, December 2011
9) Situation Economique et Sociale du Sénégal - 2011, National Statistics Agency, February 2013
10) Enquête Démographique et de Santé à Indicateurs Multiples au Sénégal (EDS-MICS) – 2010-2011, National Statistics Agency and ICF International, February 2012

We assume that the information contained in these documents constitute a reliable source of data for our subsequent estimations. The estimates are subject to our interpretation of the data and our method for calculating group specific coverage.

4.4 Ministry of Finance Civil Servants database

This database was created by the Ministry of Finance's Economics and Forecast Direction and is an easily accessible Excel spreadsheet found on their website. The database contains public finance information regarding civil servants staff and salary from 1999 to 2010, as well as revenue collection (including revenue from taxes) from 1999 to 2011. Although no information is provided regarding data collection methodology, we assume that the information presented is reliable.

5. Plans for Data Analysis

Utilizing Excel, both a descriptive and comparative analysis of the data collected was conducted. The descriptive analysis consisted of two prongs, detailed below. A comparative analysis was then conducted on the two sources of coverage data available.

5.1 Descriptive Analysis

We began with a flow of funds analysis that illustrated transfer of funds from sources to payers, payers to providers, payers to services and providers to services. This initial step was important to identify links and patterns in the way funds are received and distributed within the system. We were able to determine the kinds of services offered by specific providers and who their main payers are. The goal was to see whether health providers offered the services for which they were paid by financing agents.

We then proceeded to carry out a more thorough descriptive analysis of our data. We examined payments and expenditures made within individual financing schemes in order to figure out where each schemes was receiving funds from, and which providers were they working with to cover what services. This allowed us to assess the costs covered by each scheme and to weigh their health sector financing contribution.

5.2 Comparative Analysis

The measure of impact our research is interested in is the change in population level health coverage. However, anticipated projections from the MoH was the only source of data we could obtain. Thus we wanted to test the validity of the projections by calculating our own estimates of population level coverage over time, and comparing our estimates to those proposed by the MoH.

We used national documents of demographic and socio-economic indicators to estimate target populations and levels of health coverage within each target group. This exercise was applied to period of 2005 to 2011 and shows estimated trends in population coverage achieved by the different types of insurance schemes. Our intent was to establish whether the achieved coverage level within each scheme could be matched by its health financing contribution. To do this we created a table in which data on population coverage from the MOH was presented against our own estimates of coverage.

For the sake of our analysis, we used the targets groups found across both sources of data and for which payer information on financial contribution could be found in the NHA dataset. While not considering the impact of new schemes may seem to underestimate overall population coverage, we focused on already well-implemented schemes in an attempt to test their impact.

We suppose that the MoH data represents the "known" estimates we are trying to test against our "speculated" estimates. We conducted a sensitivity analysis on the "speculated" estimates to increase accuracy and provide upper and lower bounds. Lastly, we compared estimates of population coverage levels between the known and speculated numbers.

6. Ethical Considerations

This analysis was determined IRB-exempt because it did not meet the definition of "research" with "human subjects" as set forth in Emory policies and procedures. It entailed an analysis of secondary data, which reviewed aggregate, population-level data related to health financing and healthcare expenditures in Senegal. There was no access to data regarding information about individuals.

7. Limitations and Delimitations

This research suffered from limitations related to the data collection method. These include self-administered questionnaires in some instances, resulting in the potential for bias in the information collection process. Another limitation is the low response rates from ministries, research institutes, NGOs and private clinics.

Missing data and limited data collection time points limit both the accuracy and generalizability of our analysis. These limitations also make it more challenging to observe a consistent trend in health financing and expenditures over time, making it impractical to create predictive or inferential models.

Another important limitation of the analysis concerns the assumptions that went into calculating estimates of population level health coverage. These estimates, presented in comparison to the MOH estimates, were calculated using annual population percentages: % of working age population, % of working age population employed, % of working age population employed in public/private sectors, % of population above 60 years, % of population who report access to health coverage. We assume similar data sources were used to calculate the MOH projected estimates.

It is also important to note the scope of the data. The analysis concerns not only the resources allocated to health in the relevant time period, but also all of the health-related expenses made at health facilities by citizens and foreign nationals. These health-related expenses refer to utilized health care services that were billed by providers but not necessarily paid for.

CHAPTER IV: RESULTS

The findings from the descriptive and comparative analyses are presented in the following manner: flow of funds of Senegal's health financing system, health sector financing contribution by type of financing scheme, and population-level health coverage over time. The first two sections refer to findings from the analyzed NHA data (2006-2008), and the third describes the results from the comparative analysis of population health coverage from 2005 to 2011.

Under each section, we refer to the relevant research questions enumerated in the introductory chapter (see section on Purpose of Project).

1. Flow of Funds of Senegal's Health Financing System

This section answers the following research question: which populations are covered under the current system?

Based on the 2006 to 2008 NHA data, Senegal's total health expenditure on health experienced a slight increase with FCFA 275 billion spent in 2006; FCFA 264 billion in 2007 and FCFA 308 billion spent in 2008[1]. According to the World Bank, total health expenditure as a percent of GDP was estimated at 5.8 in 2006, 5.7 in 2007 and 5.8 in 2008 (The World Bank, 2014c). The data also supports that the per capita health expenditure also increased during that period, from FCFA 24,963 in 2006, to FCFA 22,972 in 2007 and FCFA 26,043 in 2008. Based on World Bank estimates, these were equivalent in US Dollars to $49, $56 and $66 health expenditure per capita in 2006, 2007 and 2008 respectively (The World Bank, 2014a).

In a 2010 report, the WHO estimated that the minimum spending per person per year needed to provide basic, life-saving services in 2009 was US$ 44, increasing to a little over

[1] 1 USD = 523 FCFA in 2006; 1 USD = 480 FCFA in 2007; 1 USD = 447 FCFA in 2008 (OzForex, 2011)

US$ 60 by 2015 (WHO, 2010b). Although this suggests that Senegal surpassed that figure in the three years covered by the NHA data, the figures are “an (unweighted) average across 49 countries” and “actual needs will vary by country”(WHO, 2010b) .

The range of services financed under the Senegalese system fall under the following categories: curative services, rehabilitation services, auxiliary services, medical products, preventive services, insurance/administrative costs, and health related expenditures. The data also points to funds spent on unspecified services as part of MoH admin costs and unspecified providers (Figure 1). The absence of funds allotted to long-term care should also be noted.

Curative services are comprised of hospitalizations, including related costs of drugs, laboratory/x-ray exams and hospital administrative fees, as well as consultations and outpatient care. The majority of curative services are provided by public hospitals, followed by outpatient facilities, private hospitals, traditional healers and health posts/maternities (Figure 2). The related insurance/administrative costs for these services appear to come from IPMs, showing that private sector workers and retirees are covered for curative care at service delivery points.

Rehabilitation services are those related to improving the functional capacities of patients. For these, expenditures are only observed at outpatient facilities, where there was a significant decline between 2006 and 2007 (Figure 3). These findings could indicate that these services are likely paid for out-of-pocket and not covered under any of the schemes.

Auxiliary services include laboratory, blood transfusions and x-rays provided in independent structures (usually private, not part of hospitalizations). As such, most expenditure occurs in lab and diagnostic facilities (Figure 4). Some of these services are also provided in public hospitals, outpatient facilities and private hospitals. The MoH has insurance/administrative costs related to these services, indicating that individuals with

insurance financed through government budget (civil servants, public sector workers and retirees, seniors above 60) have coverage for these services.

The medical products category refers mainly to medicines and optometry services, with most of the expenditure occurring in pharmacies, optometry shops, public hospitals and health posts/maternities (Figure 5). The MoH insurance/administrative costs associated with these expenditures also suggest coverage under government-financed schemes.

Expenditures for preventive services, including awareness and health promotion activities, come mostly from public health programs, public hospitals, outpatient facilities and health posts/maternities. There are significant associated MoH insurance/administrative costs, as well as minimal amount coming from the CSS (social security fund) (Figure 6).

The last two categories relate to overall insurance/administrative costs and health related expenses (infrastructure, equipment, health worker training, research, hygiene and sanitation). Figure 7a shows as expected that the MoH spends the most on insurance and administrative costs, followed by public health programs. Figure 7b depicts the rest of the providers more clearly with most cost being generated by other unspecified providers, private insurance firms, IPMs and mutuelles.

The funds allocated to infrastructure and equipment are spent primarily for public hospitals and health posts/maternities. Financing for health worker training is seen both at research institutes and the MoH, while research funding comes mainly from research institutes. Lastly, spending for sanitation and hygiene happens at research institutes, the MoH and public hospitals.

The services described above are presented in a single graph (see Figure 8), which provides a better representation of overall funding from 2006 to 2008. The service categories that receive the most funding within the system are health products, curative services, insurance/administrative costs, and preventive and auxiliary services. Compared to other low-

and middle-income countries, there is a similar focus on curative and preventive services. In fact, evidence suggests that service provision in those countries is mostly characterized by the treatment of illnesses for children and mothers, immunization and skilled birth attendance (Mills, 2012).

Another central element considered in the flow of funds analysis is the identification of key payers. These payers, which can be divided into public (central/decentralized government, CSS, IPRES, civil servants fund, employers) and private entities (IPM, mutuelles, FGA, private insurance firms, households, employers, not-for-profit, donors), bare significantly different costs for health services. In the first graphical representation (Figure 9a), the central government and households are the most important payers, with household expenditures increasing progressively from 2006 to 2008.

In Figure 9b, central government and households were removed from the graph to distinguish the other categories. IPMs, which cover private sector employees and retirees, are the third biggest payer, followed by the decentralized government and private insurance firms. Civil servants, who are automatically covered by the government, have a notable amount of services paid for under their designated fund (about 5 billion FCFA), compared to payments from public and private employers (both less than 1 billion FCFA). Mutuelles on the other hand, pay for significantly less services (less than 2 billion FCFA every year), despite a slight increase from 2006 to 2008. This brings into question the feasibility of voluntary health insurance as a strategy for universal coverage, especially when a significant segment of the population works in the informal sector. It was estimated in 2011 that the informal sector made up 48.8% of the employed population (ANSD, 2013b).

2. Health Sector Financing Contribution by Payer

This section addresses the following question: has the burden of health care costs on households decreased over time and been supplanted by other payers?

While the flow of funds analysis reveals that the central government and households are the biggest payers of health care services in the 2006 to 2008 period, it is important to consider the percent of total funds that are financed by the different public and private entities that make up the system. Figure 10a and Figure 10b illustrate health sector financing contributions and show the MoH and households as the primary public and private contributors. On average 74% of expenditures, as a percent of public expenditure on health, was spent by the MoH.

On the other hand, household out-of-pocket expenditure as a percent of private expenditure on health averaged 73%. Further, the burden of costs on both households and MoH did not decrease from 2006 and 2008 but instead increased slightly during the period.

It is important to note a relatively consistent and low level of financing contribution coming from the other public and private payers, suggesting that none have managed to reduce the burden of health care costs on households and the MoH.

3. Population-Level Health Coverage Over Time

An important health system financing indicator to consider is the system's ability to cover a significant percentage of an eligible population. This third section describes the level of health coverage reached by the Senegalese system between 2005 and 2007, and considers whether health coverage levels potentially improved after 2007. Coverage levels under five types of payers are considered: government budget line for the formal public sector, IPMs for the formal private sector, mutuelles, private insurance firms, and the Plan Sésame for seniors over 60.

The 2005 to 2007 period corresponds to the NHA data collection round. Although MoH coverage estimates were not available for comparison in 2005 and 2006, calculated estimates of population coverage indicate that 27% of the population was potentially covered in 2005 (Table 1a), against 50% in 2006 (Table 1b). The sensitivity analysis yields lower and upper

bounds around these estimates, and shows significantly wide intervals around the estimates. In 2005, coverage could have been as low as 7% and has high as 60%, and between 19% and 89% in 2006.

These calculations are based on estimates of each of the scheme's target populations. A ten percent range above and below these estimates is calculated for more accuracy. Using the estimated target population, estimated population coverage by scheme is calculated using the average reported household size and the percent of individuals who reported being covered by mutuelles and IPMs. For workers in the formal public and private sectors, and seniors over 60, we assume 100% coverage under their respective payers since funds for these populations are positioned annually in the government global budget.

From 2007 to 2009, the MoH estimates that 20% of the population was covered by the system (Tables 1c and 1d). This estimate is closest to the lower bound value of 18% for the 2007 comparison estimate (Table 1c), which places coverage level at 49% and the upper bound at 88%. The lower and upper bounds calculate coverage based on annual minimum and maximum estimates for population characteristics. Comparison to the MoH data suggests their estimates were likely calculated using the lowest values for those characteristics.

Similarly in 2008 and 2009, the lower bounds on the calculated estimates are closest to the MoH predicted coverage levels. In 2008, there was likely a 41% coverage level using mean values of population characteristics, with a lower bound of 16% and an upper bound of 71% (Table 1d). In 2009, mean population estimates yield a 40% coverage level, with a lower and upper bound of 16% and 71% respectively (Table 1e).

While the MoH estimates population coverage at 21% for both years, 2010 and 2011, (Tables 1f and 1g), calculations suggest higher and increasing levels of coverage that are mainly explained by demographic changes and slightly improved employment indicators pertaining to the working age population and the percent of the working age population

currently employed. Population health coverage could have reached 33% in 2010 (Table 1f), and 62% in 2011 (Table 1g).

Again, the lower bound values on both estimates are closer to the MoH estimate of 21% coverage, with 14% in 2010 (Table 1f) and 27% in 2011 (Table 1g). By maximizing population characteristics, we find that health coverage could have reached population levels as high as 57% in 2010 (Table 1f) and 95% in 2011 (Table 1g).

The calculations suggest that population health coverage under these five schemes likely increased between 2009 and 2011, which is not consistent with MoH estimates. This could be explained by increasing demographics and improved employment markets that were not considered in the MoH projections, or discrepancies in the data sources and assumptions. It is also possible that the MoH chose to report conservative estimates of population health coverage to avoid creating higher expectations.

4. Summary

The results of this analysis support the evidence that the Senegalese health financing mechanisms cover primarily workers in the formal public and private sectors. Further, population health coverage through mutuelles and private insurance firms is low, leaving a major part of the population not covered by health insurance. While some schemes, like the Plan Sésame introduced in 2006, have extended coverage to seniors over 60, they do little to impact coverage at the population level and place greater strain on government budgets.

In the absence of health coverage, households bear a significant amount of health care costs. Between 2006 and 2008, households were the primary payers of health services, second to the MoH. In fact, household out-of-pocket expenditure as percent of private expenditure on health did not decrease during this period, suggesting that other payers within the system have not supplanted the burden of costs on households.

This analysis of Senegal's health financing system has focused primarily on the five payers for which financial and population level data are available: government budget line for the formal public sector, IPMs for the formal private sector, mutuelles, private insurance firms, and the Plan Sésame for seniors over 60. Other schemes have been designed and included in the MoH's health coverage extension strategy. However they have not yet been implemented and no data are available to estimate their impact. Although these other schemes were not included in this analysis, we discuss them in the following chapter.

CHAPTER V: DISCUSSION

1. Discussion of Principal Findings

The evaluation of Senegal's health financing system raises important questions about the country's ability to carry out successful extension strategies for population health coverage in order to achieve the goal of universal health coverage. The analysis, based on National Health Accounts and population-level data, shows five principal findings.

First, full coverage for medical care is only available to seniors over 60 covered under the 'Plan Sésame'. Public and private employees in the formal sector and their families benefit from automatic health coverage for basic curative and preventive services. However, the informal sector is largely unaccounted for within Senegal's health financing system. Among the system's five key payers, none target the informal sector specifically and only two (mutuelles and private insurance firms) offer insurance plans for which informal workers, the unemployed and their families are eligible. A study conducted in Senegal seems to suggest that the cost of many of the plans offered by mutuelles, and likely private insurance firms as well remains an important deterrent to access health insurance (Mladovsky, 2014).

Second, an important health-financing indicator measured by the descriptive analysis of the 2006 to 2008 National Health Accounts is the per capita health spending. This indicator can be considered as a good proxy measure of the funds allocated to health, and the ability of such funds to support population health. The analysis of Senegal's spending pattern suggests that issues of health sector financing appear unrelated to the amount of funds spent on health per capita. In fact, Senegal's per capita health spending surpasses the minimal amount recommended by the WHO in a 2010 report.

It is however important to note the limitations inherent in this indicator given it only illustrates a per person average amount for total health expenditure. This average amount

therefore hides inequalities in wealth distribution and access within country. This is key point to consider for Senegal and other countries aiming for UHC because spending the minimal recommended amount may not necessarily mean that actual health expenditure needs are being met. Thus countries should not focus solely on meeting the recommendation, but rather figure out their specific need within their national context.

Third, The results also confirm the substantial amount of out-of-pocket expenditure on health spent at the household level in Senegal. This is another key indicator to consider for health financing reform because when out-of-pocket expenditure is large, "pooling of private resource is limited" (Abt, 2013a) and "households need to produce funds at the time of seeking care, which can be a barrier to accessing care and can threaten the financial status of the household"(Abt, 2013a).

The results show that, from 2006 to 2008, household out-of-pocket expenditure as a percent of total private expenditure on health averaged 73%. Over time, no improvement was noted and it is estimated that household spending amounted to 78.53% in 2011 (Abt, 2013a). These estimates underscore the heavy burden of healthcare costs on households. Moreover, they imply that user-exempt policies and coverage extension strategies, such as the free cesarean policy and the Plan Sésame, implemented in 2005 and 2006 respectively have not succeeded in reducing the burden of costs on households. Hence it is imperative that the impact of future coverage extension strategies embedded in the UHC program is appropriately assessed before implementation. This will require prior knowledge on the size of the groups that are to be reached: truckers, rural populations and children aged 1 to 5, so that prepayment options can be devised and adequate resources pooled. Senegal may also need to consider new domestic financing options such as the introduction of a levy on large profitable companies, taxations on luxury goods, as well as excise taxes on unhealthy food, tobacco and alcohol.

The fourth finding that came out of the analysis is the highly uneven health sector financing contributions of the different payers within the system. Among public payers, government-related payers (MoH, other central administrations, and decentralized administrations) produced on average 95.3% of total funds between 2006 and 2008, of which 74.3% came solely from the MoH. This not only demonstrates the heavy financial burden of healthcare costs on the central government budget, but also poses the question of long-term sustainability if other financing options are not introduced. The remaining 4.7% on average spent by the CSS, IPRES, the civil servants fund and public employers is symptomatic either of the limited population these funds target, formal sector workers, or of their inability to generate and disburse a greater amount of funds.

Aside from households, none of the other private payers contribute substantively to health care costs. Put together, the different insurance schemes that include IPMs, mutuelles, private insurance firms, FGA and private employers amount to 20.3% on average of total private expenditure from 2006 to 2008. It is important to note that IPM funds are ultimately equivalent to the size of private formal sector population. The funds generated by mutuelles are on the other hand largely insufficient in relation to the much broader population they are intended to reach including the informal sector. This underscores their inability, if not properly reformed, to achieve full population coverage on their own. Lastly, even though private insurance firms disburse a greater amount of funds compared to mutuelles, the percent of the population that benefit from the insurance plans they offer is much smaller.

The last important finding the results reveal relates to the quality and reliability of the data analyzed. The sensitivity analysis around the calculated coverage estimates, and their comparison to the MoH projections, produced wide lower and upper bounds around the estimates. These intervals were obtained by optimizing the estimated minimum and maximum values of population level demographic and socio-economic indicators. They point

to the uncertainty inherent in estimates of population indicators: the last population census data dates back to 2002 and the 2013 census data collection and analysis are currently on going and the final report will likely be available at the end of 2014. The results thus question the reliability and validity of the available data, and stress the need to collect better quality data, at regular intervals, for the successful monitoring and evaluation of Senegal's UHC program.

2. Strength and Limit of Analysis

In spite of the limitations of the data, one of the strengths of the analysis is the incorporation of the interval calculations around the estimates for population health coverage. This sensitivity analysis helps provide more accuracy and overcomes some of the uncertainty in the data by producing ranges around what the true estimate might have been every year.

Although this evaluation was done using 2006 to 2008 National Health Accounts, it still provides an adequate depiction of Senegal's health financing system. Because no other round of NHA has been completed since, it is not feasible to assess post-2008 changes in spending priorities and payer contributions. But substantive policy recommendations around UHC will require such data and Senegal should finalize the second round of NHA that is suppose to cover the 2009 to 2012 period. This will not only provide a more representative picture of health spending and contributions, but will also inform necessary data-driven corrections to the MoH coverage extension strategies.

3. Implications for Senegal's UHC Program

Launched in 2013, Senegal has an ambitious UHC Program given limited government and financial resources, a large informal sector and a high unemployment rate. Although complete population coverage will undoubtedly take time, significant progress can be made towards UHC given a few key considerations.

For one, it is essential to identify the reasons for the low uptake of health insurance at a population level. Since formal sector workers are automatically covered, the focus is mostly on the informal sector and the unemployed for whom mutuelles are the most viable source of health coverage. But low enrollment into mutuelles results in small pools that have limited risk sharing and cross-subsidization and ultimately threaten the financial viability of these schemes. Thus it might be time to question the current voluntary enrollment option and consider a policy that would make enrollment in a health insurance plan compulsory.

This policy would have important implications for the way in which mutuelles are managed and operate. In a 2009 household survey in Senegal, investigators explored determinants of dropout and active community participation in community-based health insurance (CBHI) in three regions of the country (Mladovsky, 2014). Levels of active participation, analyzed using logistic regression, were assessed on 387 members and ex-members of 3 CBHI schemes: Soppante (region of Thies), Ndondol (region of Diourbel) and Wer ak Werle (region of Dakar).

The results show that "the more active the mode of participation in the CBHI scheme, the stronger the statistically significant positive correlation with remaining enrolled" (Mladovsky, 2014). While financial factors did not seem to determine dropout, the study found that "members were wealthier and had higher expenditure levels than ex-members" (Mladovsky, 2014), although that was not statistically significant. Still, only 38.68% of those surveyed were satisfied with the accessibility of premium price (odds ratio not significant), suggesting that the premium was too high for most. Adverse selection was also found to be an issue as members were "twice as likely to have had an illness, accident or injury, and nearly twice as likely to have a disability than ex-members" (Mladovsky, 2014).

The study found that the following factors were most associated with either participation or dropout: training, followed by voting, participating in general assembly,

awareness raising and information dissemination, as well as informal discussions and spontaneously helping (Mladovsky, 2014).

Other intermediary outcomes were positively correlated to active participation in schemes: perceived trustworthiness of the scheme management/president, accountability and being informed of mechanisms of controlling abuse and fraud. Perception of poor quality of health services was identified as the most important determinant of drop-out (Mladovsky, 2014).

The author concludes "schemes may be able to reduce dropout and increase quality of care by creating more opportunities for more active participation", but warns that individuals "who already have higher levels of social capital may be more likely to access the resources, thereby indirectly further increasing social inequalities in health coverage" (Mladovsky, 2014). One way to avoid this unintended consequence of making CBHI schemes more efficient would be to make enrollment compulsory, thereby creating insurance pools less prone to adverse selection and moral hazard. Subsidies could be used for individuals who cannot afford the premium, and could be financed jointly through government revenues and donor grants.

The other key implication this evaluation has for Senegal's UHC program pertains to research needs for reliable, up to date, population coverage data for each of the schemes within the system. It is crucial to recognize the importance of monitoring the implementation of the coverage extension strategy, which cannot happen without the necessary baseline information on current levels of coverage. This will allow policy makers and stakeholders to consider the potential impact that the newly designed schemes for truckers, rural sector workers and children aged 0 to 5 years could have on improving the level of population health coverage. As stated earlier, finalizing the 2009 to 2012 NHA round is an essential first step to obtaining this information. Subsequently, a less expensive bi-annual survey of health

spending and health coverage reach could be carried out. This monitoring and process-evaluation component should be clearly defined within the UHC program.

CHAPTER VI: CONCLUSION & RECOMMENDATIONS

1. Policy Recommendations

Beyond political will, the success of Senegal's UHC program rests heavily on the country's existing financing system and its ability to generate and manage the resources needed for health coverage extension. The evaluation conducted for this thesis can be considered as an important first step that identified limitations in the country's health financing system. The following policy recommendations are proposed to adequately strengthen the UHC program.

First, there is a need for the government to establish compulsory health insurance enrollment, with exceptions for the indigent and the unemployed. While no data was found on the exact indigent population, the unemployment rate in 2011 was estimated at 10.2% of the working-age population (ANSD, 2013a). This policy will require a legal mandate from the government and should therefore be brought to a vote at Parliament, ideally, before the end of 2015. The mandate will affect primarily informal sector workers, who will have to purchase insurance for a defined package of minimum health services provided by mutuelles. Premium rates and payment plans would be standardized according to average income levels of different informal sector categories. The MoH, in collaboration with the Minstries of Interior and Finance, would then be responsible for the application of the mandate and enrollment of individuals.

The ultimate goal of this policy is to create a risk pool in which all contribute equitably, regardless of health status, income level or social standing. This will help eliminate the effects of moral hazard and adverse selection by allowing cross- subsidization between rich and poor, sick and healthy, but also allow financial sustainability via member premiums.

The second policy recommendation involves government regulation at two levels: fixing the cost of a minimum insurance package and standardizing the cost of the package

among all public health providers. This is an important complement to the first recommendation, as it will make sure that people are not only enrolled in a health insurance plan, but also have access to the services covered under their plan at points of service delivery. Before the end of 2014, the MoH will need to work with the insurance and public health providers to fix the cost of the package and set up a control mechanism for those providers who fail to comply.

The third and final recommendation relates to government purchasing of health services at public health care providers. Currently, care at public providers is paid for on a fee for service basis, with payment depended on a global budget set annually. As a result, the majority of public providers suffer financial debts due to important backlogs of unpaid fees. Public health facilities struggle to stay afloat financially all the while trying to respond to a constant demand for services. This often leads to demotivation among health providers and services of low quality in an attempt to contain costs (The World Bank, 2012).

Given that compulsory enrollment and government regulation of cost will likely increase the demand for health services, this policy attempts to provide a solution to financing of the supply-side by introducing a different type of payment mechanism, more appropriate to Senegal's context. The recommendation is to set up a case-based payment method, which is "a fixed payment per 'medical case' category defined by average cost per case, regardless of the actual cost incurred by the provider" (The World Bank, 2012). This payment method can incentivize providers to be more efficient in the services they deliver by reducing unnecessary input costs. In theory, this payment system can lead to more quality services, although it can be complex to manage administratively (The World Bank, 2012). Therefore the MoH should take necessary financial, administrative and organizational steps to revert to this system of payment within the next year and a half.

2. Public Health Implications

The success of Senegal's UHC program could have far-reaching consequences for access to quality health services and population health. It is imperative that implementation is coupled with key policy reforms to the health financing system. As a country that already made the political commitment to attain universal health coverage, policy makers in Senegal must now recognize that this objective cannot be reached without a well-functioning health financing system. Therefore initiating needed policy reforms is now the only course of action and necessitates both innovative financing and reliable data. Doing so will ensure gaps are addressed so that available resources are spent efficiently and an increasingly greater proportion of the Senegalese population can benefit from health insurance coverage.

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Figure 1. Financing of Unspecified Services by type of Service Provider (in FCFA)

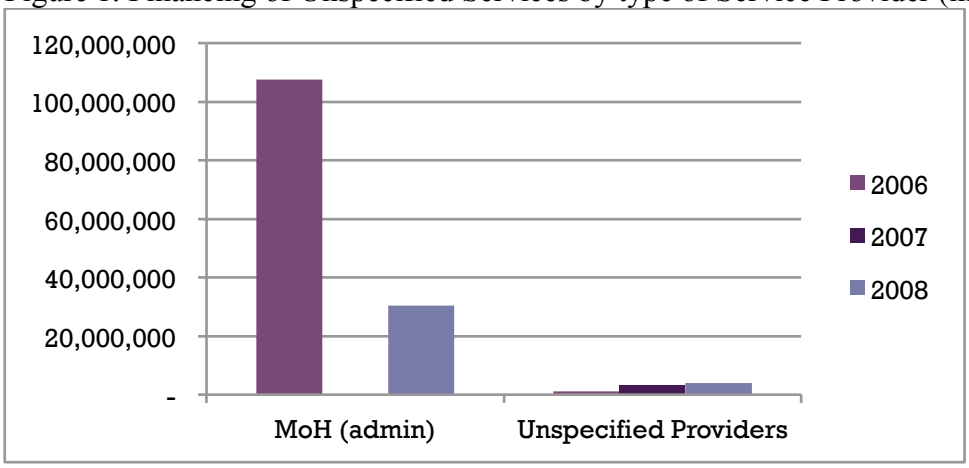

Figure 2. Financing of Curative Services by type of Service Provider (in FCFA)

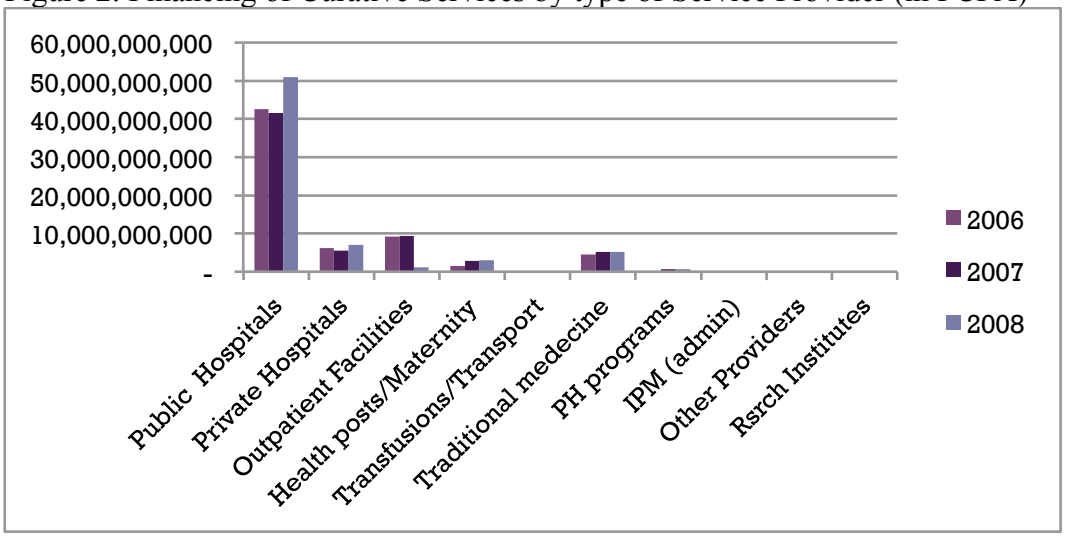

Figure 3. Financing of Rehabilitation Services by type of Service Provider (in FCFA)

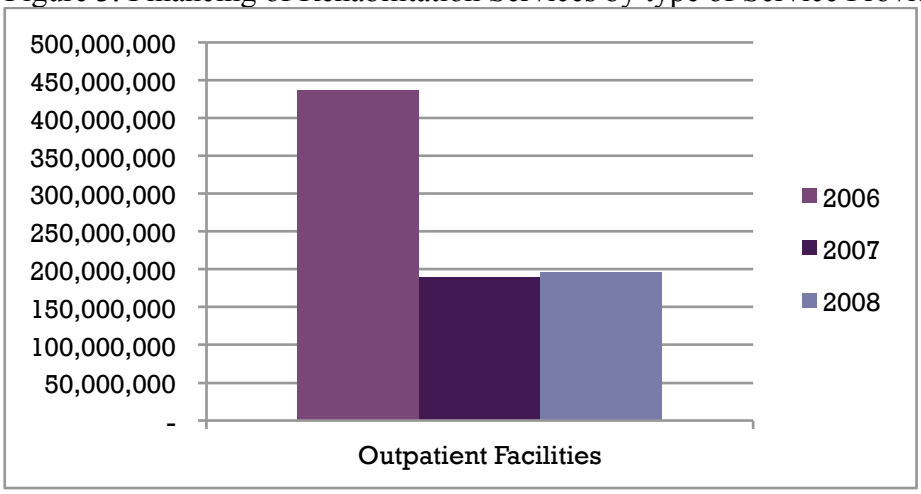

Figure 4. Financing of Auxiliary Services by type of Service Provider (in FCFA)

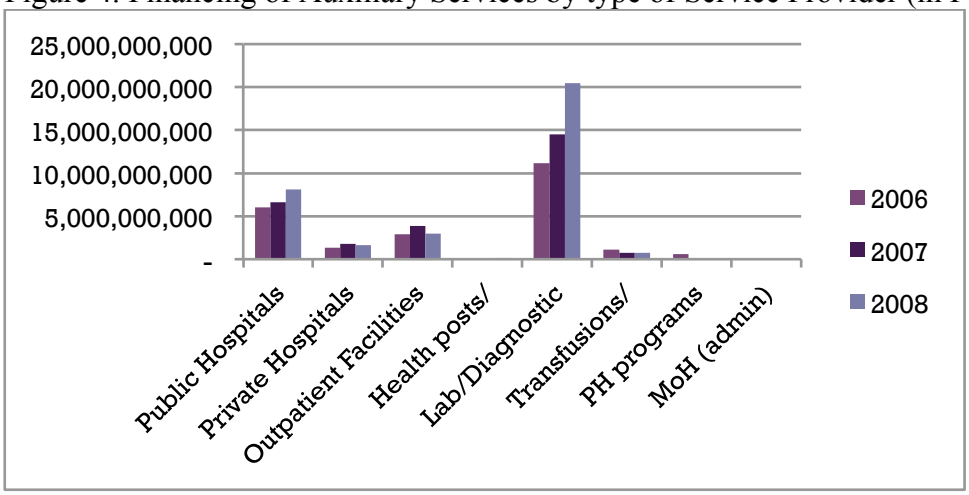

Figure 5. Financing of Medical Products by type of Service Provider (in FCFA)

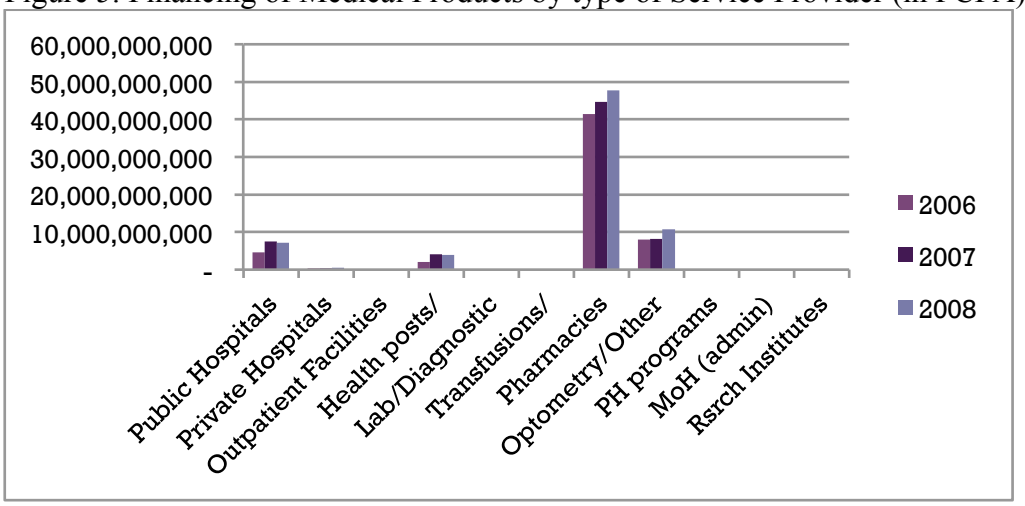

Figure 6. Financing of Preventive Services by type of Service Provider (in FCFA)

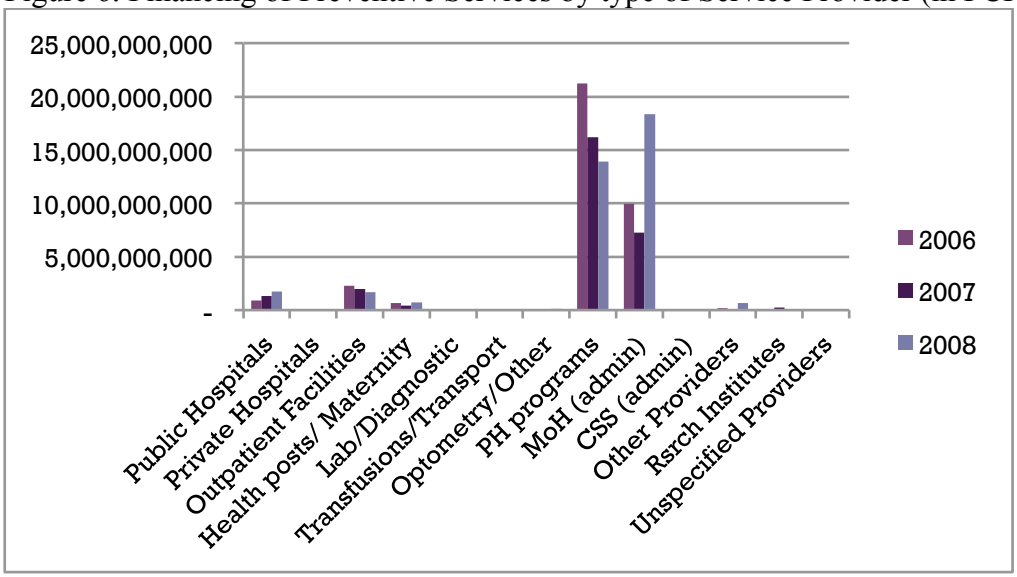

Figure 7a. Financing of Insurance/Admin by type of Service Provider (in FCFA)

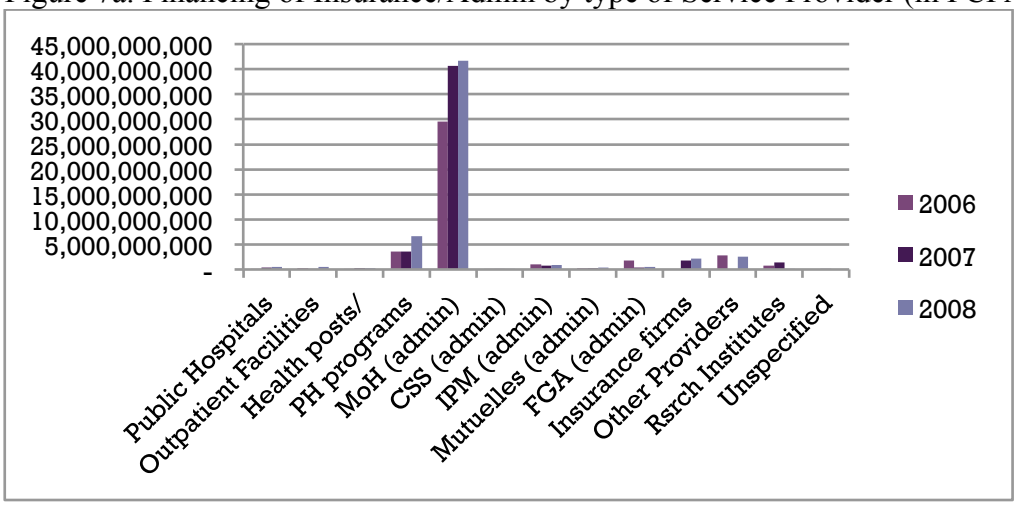

Figure 7b. Financing of Insurance/Admin by type of Service Provider (in FCFA)

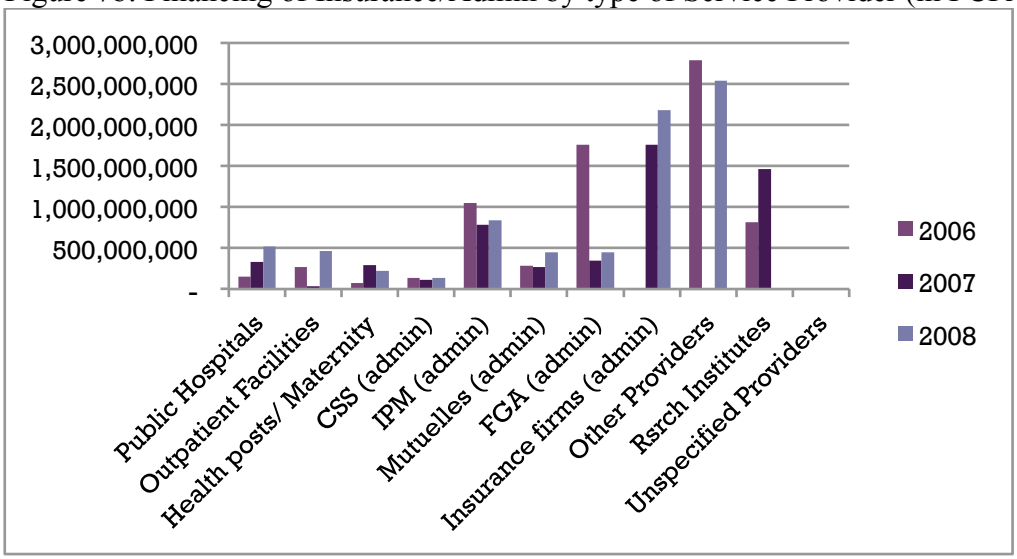

Figure 8. Financing of Health Services from 2006 to 2008 (in FCFA)

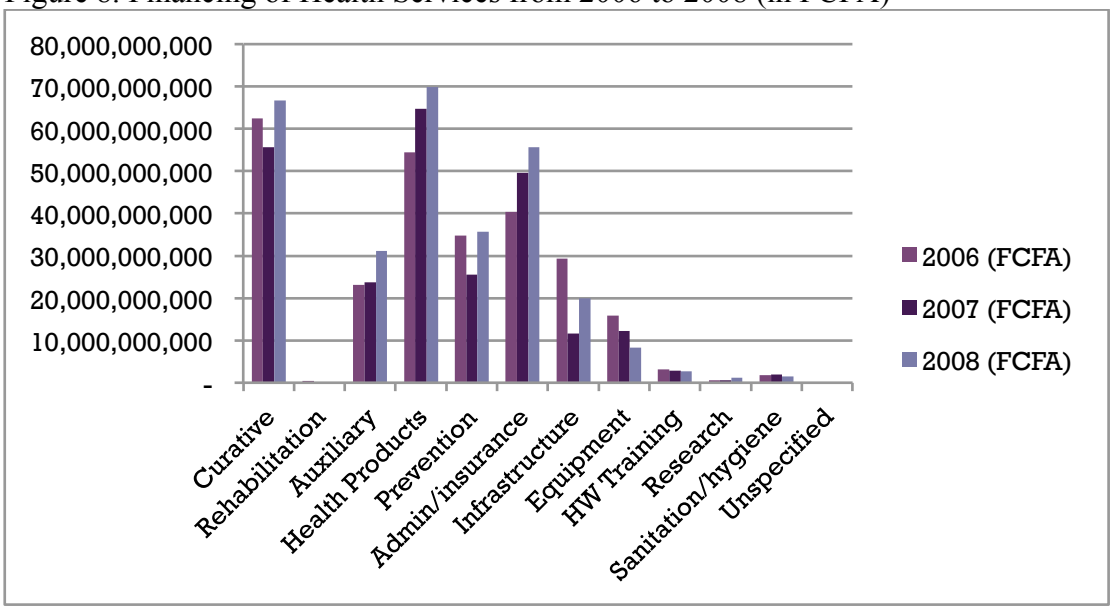

Figure 9a. Payers of Health Services from 2006 to 2008

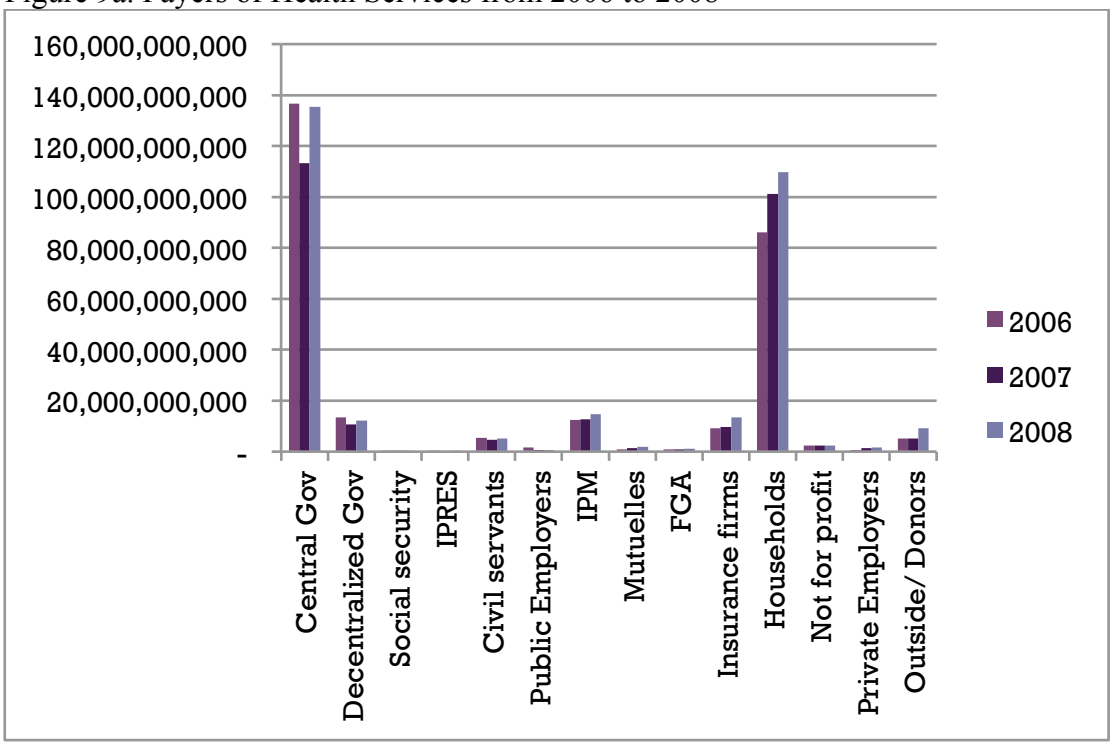

Figure 9b. Payers of Health Services from 2006 to 2008

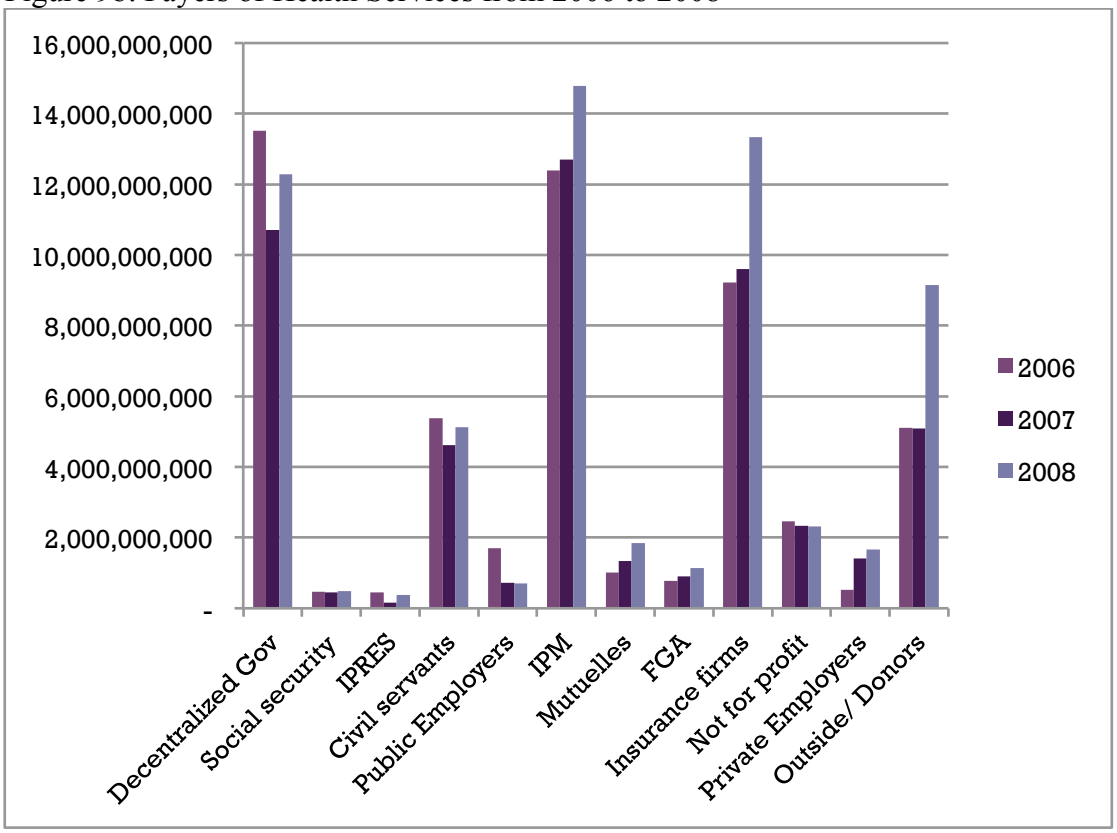

Figure 10a. Percent of Total Funds Financed by Public Entities

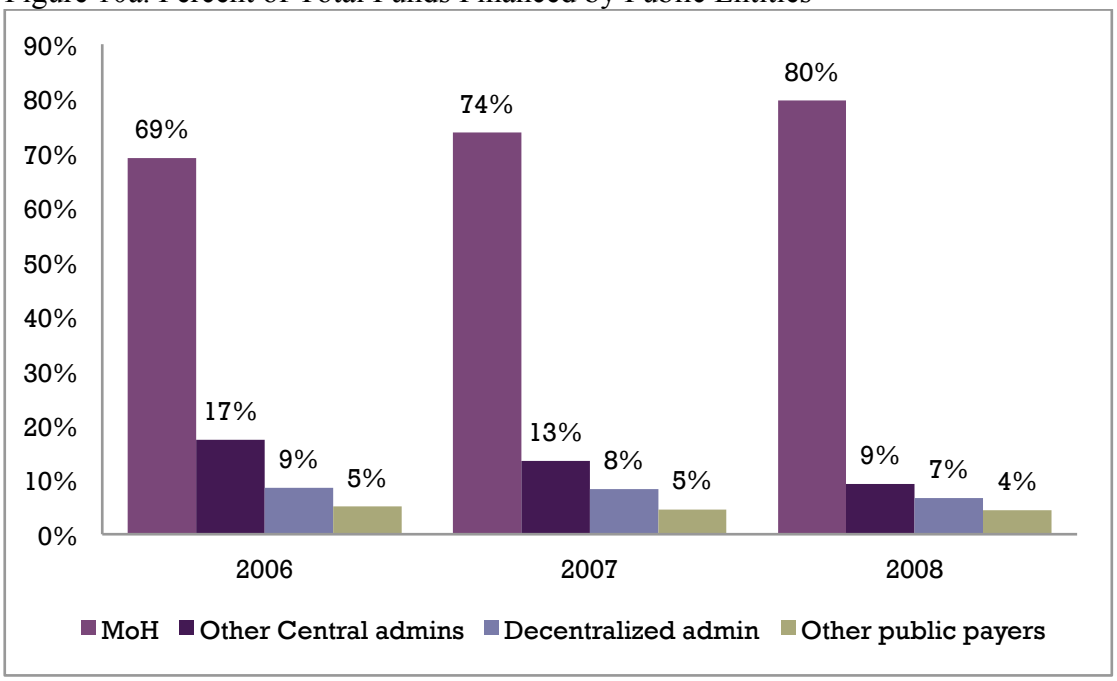

Figure 10b. Percent of Total Funds Financed by Private Entities

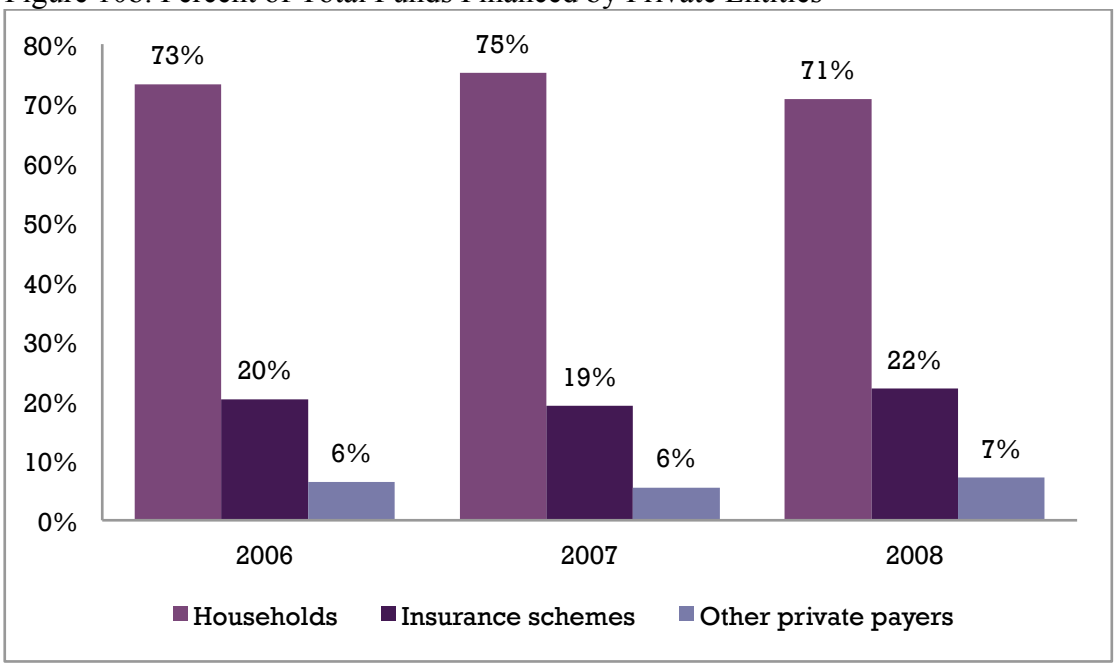

Table 1a. Comparative Analysis of MoH and Estimated Coverage Levels in 2005

Type of Scheme	Payer	Target Population	2005							
			MOH estimates "known" coverage	Research estimates "speculated" coverage			Research estimates "speculated" target			FINANCE MINISTRY
					Lower bound	Upper bound		Lower bound	Upper bound	
Automatic enrollment without contribution	Government Budget	PUBLIC SECTOR EMPLOYEES/ RETIREES & CIVIL SERVANTS	-	**1,038,872**	519,436	1,298,590	**129,859**	116,873	142,845	77,624
Automatic enrollment with contribution	IPM	PRIVATE SECTOR EMPLOYEES	-	**111,312**	55,656	139,140	**13,914**	12,523	15,305	
Voluntary enrollment with premium	Mutuelles	UNDEFINED	-	**1,521,201**	129,859	4,285,334	**4,637,807**	4,174,026	5,101,588	
	Insurance Firms	UNDEFINED	-	**222,615**	37,102	816,254	**4,637,807**	4,174,026	5,101,588	
Card-based enrollment without contribution	Plan Sésame	SENIORS ABOVE 60 YEARS	-	-	-	-	-	-	-	
		TOTAL COVERED	-	**2,893,999**	742,053	6,539,318				
		TOTAL POPULATION	-	**10,817,844**	10,817,844	10,817,844				
		% OF POPULATION COVERED	-	**27%**	7%	60%				

Table 1b. Comparative Analysis of MoH and Estimated Coverage Levels in 2006

Type of Scheme	Payer	Target Population	2006							
			MOH estimates "known" coverage	Research estimates "speculated" coverage			Research estimates "speculated" target			FINANCE MINISTRY
					Lower bound	Upper bound		Lower bound	Upper bound	
Automatic enrollment without contribution	Government Budget	PUBLIC SECTOR EMPLOYEES/ RETIREES & CIVIL SERVANTS	-	**1,213,968**	606,984	1,517,460	**151,746**	136,571	166,921	79,936
Automatic enrollment with contribution	IPM	PRIVATE SECTOR EMPLOYEES	-	**1,734,240**	867,120	2,167,800	**216,780**	195,102	238,458	
Voluntary enrollment with premium	Mutuelles	UNDEFINED	-	**1,837,305**	156,843	4,705,293	**5,601,539**	5,041,385	6,161,693	
	Insurance Firms	UNDEFINED	-	**268,874**	44,812	896,246	**5,601,539**	5,041,385	6,161,693	
Card-based enrollment without contribution	Plan Sésame	SENIORS ABOVE 60 YEARS	-	**508,225**	457,403	559,048	**508,225**	457,403	559,048	
		TOTAL COVERED	-	**5,562,612**	**2,133,162**	**9,845,847**				
		TOTAL POPULATION	-	**11,048,401**	**11,048,401**	**11,048,401**				
		% OF POPULATION COVERED	-	**50%**	**19%**	**89%**				

Table 1c. Comparative Analysis of MoH and Estimated Coverage Levels in 2007

Type of Scheme	Payer	Target Population	2007							
			MOH estimates "known" coverage	Research estimates "speculated" coverage			Research estimates "speculated" target			FINANCE MINISTRY
					Lower bound	**Upper bound**		**Lower bound**	**Upper bound**	
Automatic enrollment without contribution	Government Budget	PUBLIC SECTOR EMPLOYEES/ RETIREES & CIVIL SERVANTS	859,693	**1,265,696**	632,848	1,582,120	**158,212**	142,391	174,033	82,215
Automatic enrollment with contribution	IPM	PRIVATE SECTOR EMPLOYEES	400,000	**1,808,144**	904,072	2,260,180	**226,018**	203,416	248,620	
Voluntary enrollment with premium	Mutuelles	UNDEFINED	421,760	**1,915,601**	163,527	4,905,808	**5,840,248**	5,256,223	6,424,273	
	Insurance Firms	UNDEFINED	24,500	**280,332**	46,722	934,440	**5,840,248**	5,256,223	6,424,273	
Card-based enrollment without contribution	Plan Sésame	SENIORS ABOVE 60 YEARS	555,690	**414,692**	373,223	456,161	**414,692**	373,223	456,161	
		TOTAL COVERED	2,261,643	**5,684,465**	2,120,392	10,138,709				
		TOTAL POPULATION	11,519,226	**11,519,226**	11,519,226	11,519,226				
		% OF POPULATION COVERED	20%	**49%**	18%	88%				

Table 1d. Comparative Analysis of MoH and Estimated Coverage Levels in 2008

			2008							
Type of Scheme	Payer	Target Population	MOH estimates "known" coverage	**Research estimates "speculated" coverage**			**Research estimates "speculated" target**			FINANCE MINISTRY
					Lower bound	**Upper bound**		**Lower bound**	**Upper bound**	
Automatic enrollment without contribution	Government Budget	PUBLIC SECTOR EMPLOYEES/ RETIREES & CIVIL SERVANTS	885,483	**1,015,368**	507,684	1,269,210	**126,921**	114,229	139,613	80,215
Automatic enrollment with contribution	IPM	PRIVATE SECTOR EMPLOYEES	412,000	**1,450,528**	725,264	1,813,160	**181,316**	163,184	199,448	
Voluntary enrollment with premium	Mutuelles	UNDEFINED	459,718	**1,536,738**	131,185	3,935,549	**4,685,177**	4,216,659	5,153,695	
	Insurance Firms	UNDEFINED	25,235	**224,888**	37,481	749,628	**4,685,177**	4,216,659	5,153,695	
Card-based enrollment without contribution	Plan Sésame	SENIORS ABOVE 60 YEARS	572,361	**598,201**	538,381	658,021	**598,201**	538,381	658,021	
		TOTAL COVERED	2,354,797	**4,825,724**	1,939,995	8,425,568				
		TOTAL POPULATION	11,841,123	**11,841,123**	11,841,123	11,841,123				
		% OF POPULATION COVERED	20%	**41%**	16%	71%				

Table 1e. Comparative Analysis of MoH and Estimated Coverage Levels in 2009

Type of Scheme	Payer	Target Population	2009							
			MOH estimates "known" coverage	Research estimates "speculated" coverage			Research estimates "speculated" target			FINANCE MINISTRY
					Lower bound	**Upper bound**		**Lower bound**	**Upper bound**	
Automatic enrollment without contribution	Government Budget	PUBLIC SECTOR EMPLOYEES/ RETIREES & CIVIL SERVANTS	912,048	**1,043,680**	521,840	1,304,600	**130,460**	117,414	143,506	84,247
Automatic enrollment with contribution	IPM	PRIVATE SECTOR EMPLOYEES	420,000	**1,490,976**	745,488	1,863,720	**186,372**	167,735	205,009	
Voluntary enrollment with premium	Mutuelles	UNDEFINED	501,093	**1,579,584**	134,843	4,045,275	**4,815,804**	4,334,224	5,297,384	
	Insurance Firms	UNDEFINED	25,992	**231,159**	38,526	770,529	**4,815,804**	4,334,224	5,297,384	
Card-based enrollment without contribution	Plan Sésame	SENIORS ABOVE 60 YEARS	589,532	**547,707**	492,936	602,478	**547,707**	492,936	602,478	
		TOTAL COVERED	2,448,665	**4,893,105**	1,933,633	8,586,602				
		TOTAL POPULATION	12,171,264	**12,171,264**	12,171,264	12,171,264				
		% OF POPULATION COVERED	20%	**40%**	16%	71%				

Table 1f. Comparative Analysis of MoH and Estimated Coverage Levels in 2010

Type of Scheme	Payer	Target Population	2010							
			MOH estimates "known" coverage	Research estimates "speculated" coverage			Research estimates "speculated" target			FINANCE MINISTRY
					Lower bound	**Upper bound**		**Lower bound**	**Upper bound**	
Automatic enrollment without contribution	Government Budget	PUBLIC SECTOR EMPLOYEES/ RETIREES & CIVIL SERVANTS	939,409	**873,688**	436,844	1,092,110	**109,211**	98,290	120,132	85,618
Automatic enrollment with contribution	IPM	PRIVATE SECTOR EMPLOYEES	440,000	**1,248,128**	624,064	1,560,160	**156,016**	140,414	171,618	
Voluntary enrollment with premium	Mutuelles	UNDEFINED	546,191	**1,168,342**	99,736	2,992,094	**3,562,017**	3,205,815	3,918,219	
	Insurance Firms	UNDEFINED	26,772	**170,977**	28,496	569,923	**3,562,017**	3,205,815	3,918,219	
Card-based enrollment without contribution	Plan Sésame	SENIORS ABOVE 60 YEARS	607,217	**593,362**	534,026	652,698	**593,362**	534,026	652,698	
		TOTAL COVERED	2,559,589	**4,054,496**	1,723,166	6,866,985				
		TOTAL POPULATION	12,109,434	**12,109,434**	12,109,434	12,109,434				
		% OF POPULATION COVERED	21%	**33%**	14%	57%				

Table 1g. Comparative Analysis of MoH and Estimated Coverage Levels in 2011

Type of Scheme	Payer	Target Population	2011						
			MOH estimates "known" coverage	**Research estimates "speculated" coverage**			**Research estimates "speculated" target**		
					Lower bound	**Upper bound**		**Lower bound**	**Upper bound**
Automatic enrollment without contribution	Government Budget	PUBLIC SECTOR EMPLOYEES/ RETIREES & CIVIL SERVANTS	967,591	**2,283,464**	1,141,732	2,854,330	**285,433**	256,890	313,976
Automatic enrollment with contribution	IPM	PRIVATE SECTOR EMPLOYEES	460,000	**3,262,104**	1,631,052	4,077,630	**407,763**	366,987	448,539
Voluntary enrollment with premium	Mutuelles	UNDEFINED	595,349	**1,488,582**	127,074	3,812,222	**4,538,360**	4,084,524	4,992,196
	Insurance Firms	UNDEFINED	27,575	**217,841**	36,307	726,138	**4,538,360**	4,084,524	4,992,196
Card-based enrollment without contribution	Plan Sésame	SENIORS ABOVE 60 YEARS	625,434	**663,022**	596,720	729,324	**663,022**	596,720	729,324
		TOTAL COVERED	2,675,949	**7,915,013**	3,532,885	12,199,644			
		TOTAL POPULATION	12,855,153	**12,855,153**	12,855,153	12,855,153			
		% OF POPULATION COVERED	21%	**62%**	27%	95%			

Map 1: Map of Senegal's medical regions and health districts