



IMPROVING ACCESS TO LIFE SAVING MATERNAL HEALTH SERVICES: THE EFFECTS OF REMOVING USER FEES FOR CAESAREANS IN MALI



April 2011

This publication was produced for review by the United States Agency for International Development. It was prepared by Marianne El-Khoury, Timothee Gandaho, Aneesa Arur, Binta Keita, and Lisa Nichols for the Ministry of Health in Mali and for the Health Systems 20/20 Project.



Mission

The Health Systems 20/20 **cooperative agreement**, funded by the U.S. Agency for International Development (USAID) for the period 2006-2011, helps USAID-supported countries address health system barriers to the use of life-saving priority health services. Health Systems 20/20 works to strengthen health systems through integrated approaches to improving financing, governance, and operations, and building sustainable capacity of local institutions.

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DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development (USAID) or the United States Government.

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ACRONYMS

ASACO	<i>Association de Santé Communautaire</i> (Community Health Association)
ATN Plus	<i>Assistance Technique Nationale Plus</i> (Improving National Capacity to Implement High Impact Health Services and Promote Healthy Behaviors in Mali Project)
CHU	<i>Centre Hospitalier Universitaire</i> (University Hospitals)
CSCCom	<i>Centres de Santé Communautaire</i> (Community Health Centers)
CSRef	<i>Centres de Santé de Référence</i> (Referral Health Centers)
DAF	<i>Direction Administrative et Financière</i> (Administrative and Finance Directorate)
DHS	Demographic and Health Survey
DNS	<i>Direction Nationale de la Santé</i> (National Directorate of Health)
DSR	<i>Division Santé de la Reproduction</i> (Department of Reproductive Health)
EPH	<i>Etablissement Public Hospitalier</i> (Regional Hospital)
FGD	Focus Group Discussions
HMIS	Health Management Information System
Impact	Initiative for Maternal Mortality Program Assessment
MDG	Millennium Development Goals
MMR	Maternal Mortality Ratio
MoH	Ministry of Health
PRODESS	<i>Programme de Développement Sanitaire et Social</i> (Health and Social Development Program)
RAC	<i>Réseau Autonome de Communication</i> (Radio Communication Network)
SES	Socioeconomic Status
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

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EXECUTIVE SUMMARY

In 2005, the government of Mali removed user fees for caesarean sections in public sector facilities and army hospitals throughout all regions of the country and the District of Bamako. The fee exemption policy was driven by the need to improve maternal health indicators by increasing access to skilled birth attendance and emergency obstetric care. The policy, financed entirely by the government's budget, was applied to the direct costs of the caesarean procedure. This includes pre-operative examinations, provision of a caesarean kit, surgical costs, and post-operative treatment, hospitalization, and laboratory tests. The policy does not, however, cover transportation and other indirect costs associated with the referral system, which are shared instead among the mayor's office, the local district council, local community associations, and households. The free caesarean policy is now implemented in 57 health facilities in Mali: 49 referral health centers also known as *Centres de Santé de Référence* (CSRef), six regional hospitals known as *Etablissements Publics Hospitaliers* (EPH), and two national university hospitals or *Centres Hospitaliers Universitaires* (CHU).

The objective of this study is threefold:

- a. Assess the effects of removing caesarean user fees in the public sector in Mali on access to caesareans, especially among women of low socioeconomic status (SES);
- b. Understand how the policy is being implemented at the facility level; and
- c. Identify key remaining barriers to accessing caesareans in order to inform appropriate future interventions or programmatic changes to reduce maternal mortality in Mali.

With the approval of the Ministry of Health (MoH) in Mali, and in close collaboration with the USAID-funded ATN Plus project¹, Health Systems 20/20 employed a number of qualitative and quantitative methods to explore these objectives. These include:

- An analysis of trends in caesarean rates between 2005 and 2009 using Health Management Information System (HMIS) data;
- An analysis of socioeconomic data collected from 3,968 women who delivered or had caesareans in 41 selected public facilities throughout all regions of Mali;
- An analysis of facility data collected using interviews with 267 health providers in the same selected public facilities as well as 47 key stakeholders; and
- An analysis of qualitative data collected using focus group discussions (FGD) with 206 participants and in-depth interviews with 11 women who underwent caesarean sections.

¹ Improving National Capacity to implement High Impact Health Services and Promote Healthy Behaviours in Mali (*Assistance Technique Nationale Plus* or ATN Plus), 2008-2013; implemented by Abt Associates Inc.

The main findings are summarized below:

- Across the board, service providers, communities, and local political actors support the free policy, and perceive that it benefits the economically disadvantaged and increases their access to emergency obstetric care.
- Since the launch of the free caesarean initiative, institutional deliveries and caesarean section rates in Mali have increased. Between the start of the policy in 2005 and 2009, the estimated population-based caesarean rate has more than doubled – from 0.9 percent of all deliveries in 2005 to 2.3 percent in 2009. Rates tripled in certain regions. Likewise, facility deliveries have increased, from 53 percent of total expected deliveries in the population in 2005 to 64 percent in 2009.
- Post-caesarean maternal and neonatal deaths declined in most regions from 2006 to 2009, most likely the result of shorter delays in seeking emergency care and shorter wait times experienced at facilities. The proportion of caesarean procedures that resulted in maternal deaths declined from 2 percent in 2006 to 1.3 percent in 2009 and the proportion resulting in neonatal deaths declined from 14 percent in 2006 to 12 percent in 2009.
- The free caesarean policy seems to be disproportionately benefiting the wealthier groups. An estimated 24 percent of women delivering via caesarean section in public health facilities belong to the poorest third of the population, suggesting remaining barriers to access among women of low SES. This pattern seems to be most prominent in Kayes, Sikasso, Koulikoro, and the Northern regions.
- The referral and emergency transport system for obstetric emergencies remains one of the weakest elements of the free caesarean policy. Weaknesses in the functioning of solidarity funds, created as a means to cover transport-related costs, have shifted transportation costs onto households, in many instances creating a significant financial burden. The extreme poor are thus excluded, and this may be one of the reasons why they are not benefiting as fully from the policy as expected.
- Problems with referrals are further aggravated by weak communication linkages between health facilities, a shortage of blood banks, and problems with the government-provided caesarean kits, including frequent stock-outs, insufficient quantities of drugs, and sometimes obsolete products.
- To communities, high costs of prescription drugs, high transportation costs, and difficult road conditions continue to be the main deterrents to accessing health facilities. Socio-economic and cultural factors are still driving low utilization of maternal health services. Finally, although the free caesarean policy is becoming increasingly well known, information about the specific components of the policy remains fragmented.

Recommended policy options include strengthening the functioning of the referral and emergency transport system between the first level of facilities (*Centres de Santé Communautaire* or CSCoM) and the CSRef or hospitals, establishing an appropriate transport system between the villages and the CSCoM, setting up reliable communication networks between facilities, revisiting the content of the caesarean kits, establishing sufficient numbers of blood banks, and setting up an effective system for blood collection, and increasing awareness among communities on the importance of assisted deliveries in the specific elements of the caesarean policy.

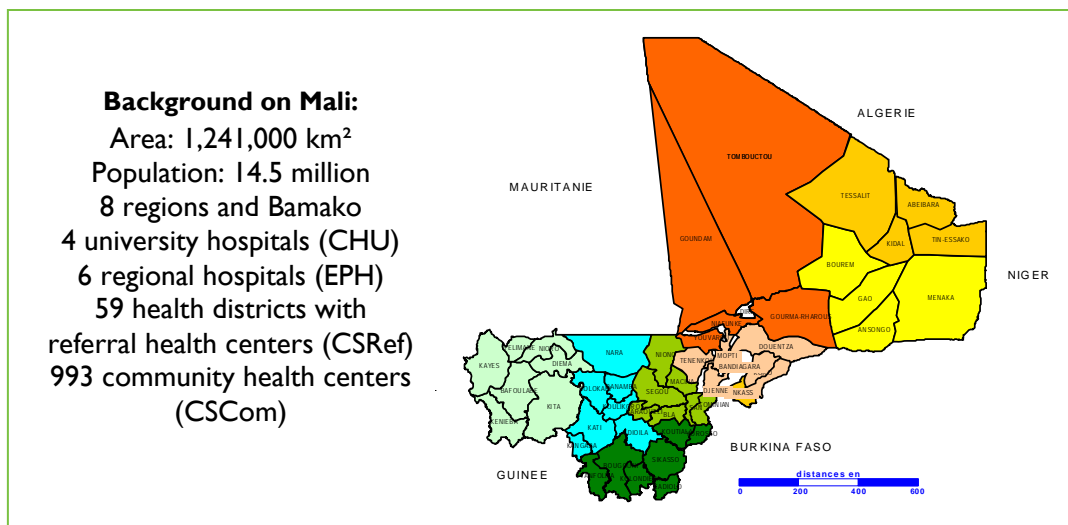
Finally, a significant number of health providers and stakeholders remain skeptical about the financial sustainability of the free caesarean policy. A long-term strategy to address the sustainability of the policy and to improve affordability of and access to all essential obstetric care in Mali may be warranted.

I. INTRODUCTION

I.1 CONTEXT AND RATIONALE

Despite more than a decade of health sector reforms, Mali's maternal health indicators remain a concern. The maternal mortality ratio (MMR) is high, with 464 maternal deaths per 100,000 live births (Macro International 2007), and the burden of maternal mortality is disproportionately clustered among the poor. The lifetime risk of dying in pregnancy in Mali is 1 in 15 compared with 1 in 2,800 in developed countries (WHO et al. 2007). According to the most recent (2006) Demographic and Health Survey (DHS), less than half of women give birth in a health care facility, although the percentage has increased from 38 percent in 2001 to 45 percent in 2006. Less than half of births were attended by a skilled provider, and 14 percent of women gave birth with no assistance (Macro International 2007).

Skilled birth attendance and life-saving obstetric procedures such as caesarean sections are considered critical interventions for safe motherhood, as they allow a timely response to potentially fatal emergencies. With caesarean rates in 2005 below 1 percent of live births, policymakers agreed that there was a large unmet need for life-saving obstetric surgery in Mali. It was acknowledged that progress towards meeting the 5th Millennium Development Goal (MDG5) ("Improve Maternal Health") in Mali would require increased attention towards increasing skilled birth attendance and access to life-saving obstetric procedures such as caesareans.



Source: HMIS 2009

In the context of high and stagnating MMR, slow progress with increasing skilled attendance at birth, and documented inequity in access to safe motherhood services, fee exemptions for maternal health services are being employed as a strategy to reduce financial barriers in many developing countries. Financial barriers play an important role in preventing women from delivering in health facilities and accessing services in obstetric emergencies. Maternal health care costs can be very expensive and sometimes catastrophic, with the potential to plunge a household into poverty. The affordability of obstetric care thus has large implications for maternal and neonatal survival and well-being.

On June 23, 2005 the government of Mali announced that it would provide free caesareans in public hospitals, referral health centers also known as *Centres de Santé de Référence* (CSRef), and army health institutions.² The stated objective was to make such life-saving emergency obstetric care accessible to all pregnant women with clinical need for caesarean delivery, and help reduce maternal and neonatal mortality. The announcement was followed by circular letter No. 1003 MS/SG on June 27, 2005 from the MoH, informing health personnel of the new policy, and later by Decree No. 05-350/P-RM on August 4, 2005 from the Council of Ministers specifying its implementation modalities. An inter-ministerial decree No09-0754/MS/MF/MDAC/MATCL/SG of April 3rd 2009 endorses the modalities for reimbursement under the policy. The fee exemption policy was applied to the entire direct cost of the caesarean procedure. This includes pre-operative examinations, a caesarean kit, surgical costs, and post-operative treatment and hospitalization. The policy does not cover transportation and other indirect costs that are intended to be covered by existing financing mechanisms built into the referral and emergency transport policy³ (see below). The free caesarean policy is being implemented in 57 health facilities in Mali: 49 CSRef, six regional hospitals or *Etablissements Publics Hospitaliers* (EPH), and two national university hospitals or *Centres Hospitaliers Universitaires* (CHU).

The policy is implemented through semiannual distribution of caesarean kits and quarterly reimbursement of costs incurred by health facilities. Facilities receive 30,000 FCFA (US\$60) for a simple caesarean and 42,000 FCFA (US\$84) for a complicated caesarean (*Ministère de la Santé, 2009a*). Ambulances stationed at the CSRef transport women from lower-level public sector health centers that perform normal deliveries (known as *Centres de Santé Communautaire* or CSCoM) to CSRef or hospitals that perform caesareans. Fuel and small maintenance costs for these ambulances as well as payments to drivers are shared between the local mayor's office, the district health council⁴ and local community associations or the ASACO⁵. Transportation costs from the village to the CSCoM and to return home are paid for by the family. Finally, a 'caesarian point person' (*Point Focal*) in every CSRef, hospital, and regional health directorate is responsible for compiling routine data on caesarians. The point person is usually the obstetrician or surgeon in charge or a midwife.

Components of the Free Caesarean Policy in Mali:

Contributed by the government:

- Kits for simple caesarean (US\$60)
- Kits for complicated caesarian (US\$84)
- Hospitalization/lab tests costs (US\$60)

Contributed by the community (solidarity fund):

- Transportation costs (fuel and maintenance and drivers' compensation) for referrals or evacuations with ambulance from the CSCoM to the CSRef

² The Malian health system has a pyramidal structure. The base of the health system consists of clinics charged with providing the minimum package of health care. These community health clinics, the individual's first level of contact with the health system, are called *Centres de Santé Communautaire* (CSCoM). If the patients' needs cannot be met at the CSCoM, they are referred to the district level, the first level of the referral system. The district level has health referral centers called *Centres de Santé de Référence* (CSRef). Mali's regional hospitals (EPH) form the second level and are charged with the responsibility for health care in their respective regions. The university hospitals (CHU) form the top of the pyramid (third level) and act as the principal provider of tertiary care.

³ Solidarity funds have been created as a means to cover transport related costs, such as small repairs, drivers' fees, and gas costs, from the CSCoM to CSRef. They are financed through contributions from the *Associations de Santé Communautaire* (ASACO) (defined below), the mayor's office, and the district council.

⁴ The district health council is composed of members elected by secret ballot and for five years. The council supervises the affairs of the district, especially those relating to economic, social and cultural development programs.

⁵ ASACO are local community health associations that act like a board of directors for the CSCoM, whose role is to ensure proper operation and management of the facility. The ASACO were created as part of the Bamako Initiative to decentralize the management of primary health centers. They are financed through household membership contributions and user fees for services at CSCoM.

User fees are still charged for normal deliveries and antenatal care at health facilities.

The initiative has received a lot of support both inside and outside of Mali, with high expectations for a positive impact in reducing maternal mortality (*Ministère de la Santé*, 2007). The government of Mali's commitment to the initiative is clear, as the policy is funded entirely by domestically raised resources (*Ministère de la Santé*, 2009a). Government funding for the policy has reached an aggregate of 5,867,000,000 FCFA (US\$11,734,000) over the past five years, increasing steadily from 460,691,000 FCFA (US\$921,382) in 2005 to 1,753,374,000 FCFA (US\$3,506,748) in 2009 or an average 40 percent increase every year (*DAF Santé*, 2010).

As in many developing countries, however, user fees are not the only potential barrier to accessing caesareans. While access may improve as a result of free care, other barriers could prevent women, especially the poor, from delivering at health facilities and from reaching referral facilities where caesarean services are available. Examples of such factors include high transportation costs to facilities, delays in reimbursements to facilities providing free services, or other demand-side factors such as cultural barriers. Policymakers in Mali are therefore interested in examining the effects of user fee exemptions for caesareans on access to caesarean services, especially among women of low socioeconomic status (SES), and to identify the most critical remaining barriers to access and make actionable recommendations to address them.

With approval from the MoH and in close collaboration with the USAID-funded ATN Plus project, Health Systems 20/20 examined the effects of removing user charges for caesareans in Mali. This report is the product of extensive research conducted in the field over the last year to meet the objectives stated below.

1.2 STUDY OBJECTIVES

The objective of the study is threefold:

- a. Assess the effects of removing caesarean user charges in the public sector in Mali on access to caesareans, especially among women of low SES;
- b. Understand how the policy is being implemented at the facility level; and
- c. Identify key remaining barriers to accessing caesareans in order to inform appropriate future interventions or programmatic changes to reduce maternal mortality in Mali.

More specifically, the study seeks to answer the following questions:

- a. Effect on access:
 - Have the number and rates of caesareans performed in public sector facilities increased since the policy was introduced in mid-2005, and to what extent?
 - What is the proportion and number of women from lower socioeconomic strata receiving caesareans at public sector facilities among all caesarean cases?
 - Has the number of women delivering in public sector health facilities (including CCom) increased since the policy of free caesareans was implemented?
 - How have maternal and neonatal outcomes changed since the policy of free caesareans was introduced?

b. Policy implementation:

- What are the resources available to health facilities to provide caesarean sections and support services (ambulances, equipment, drugs and supplies) necessary for caesareans, and how adequate are they?
- Are there enough qualified and authorized staff available to perform caesareans and normal deliveries in health facilities (CSRef and hospitals)?
- How do facility staff perceive the caesarean policy and the changes (if any) that it has effected?

c. Remaining barriers:

- What are the other important barriers to accessing caesareans in particular and institutional deliveries in general, especially for women from low SES families (lack of awareness, additional financial barriers, cultural preferences, etc.)?
- What are possible approaches/interventions to lower remaining barriers to access?

To answer these questions, we employed a combination of qualitative and quantitative methods. We explored trends in access to caesareans (objective 1) using data from public sector facilities (analysis of Health Management Information System [HMIS] data) and analyzed the SES of beneficiaries. We examined the policy environment and identified barriers to institutional deliveries (objectives 2 and 3) using community-level and facility-level data collected through surveys and focus group discussions (FGD).

1.3 BACKGROUND DOCUMENTS

This report compiles and synthesizes key findings from a series of documents that explore in detail various aspects of this research. These are:

- A background document and literature review on the health sector in Mali and the user fee exemption policy for caesareans (Health Systems 20/20 and ATN Plus 2009, available in English upon request).
- A detailed analysis of the policy environment and implementation at the facility level, including an examination of the availability of resources in facilities, the speed and level of reimbursement, and the availability of qualified personnel authorized to perform caesarean sections. This is based on facility-level research (Guèye and Amidou 2010; henceforth *Facility report*, available in French upon request).
- A detailed analysis of the remaining barriers to accessing caesareans and institutional deliveries, especially among poor women. This is based on community-level research (Konaté et al. 2010; henceforth *Community report*, available in French upon request).

2. BACKGROUND

Maternal health user fee exemptions have been employed as a strategy to increase service utilization and decrease financial barriers to care in numerous countries in sub-Saharan Africa. In Burundi, fee exemptions for pregnant women and children under age 5 were introduced in 2006, and utilization appears to have increased as a result. In 2006, the government of Burkina Faso launched an 80 percent subsidy for delivery-associated fees. In turn, fee exemptions for caesareans and services for children were announced in Sudan in January 2008. In Ghana, an exemption policy for delivery fees and all costs associated with intrapartum care in public and private facilities was introduced in 2004, and subsequently extended by the National Health Insurance Scheme. In 2005, Senegal decided to make delivery and caesarean sections free to the public. As a result, attended deliveries rose by 77 percent between 2004 and 2006 in areas covered by the fee exemption as opposed to 19 percent in areas that were not covered (Immpact and UNFPA, 2009).

In general, research studies around these exemption policies have consistently shown the following:

- Fee exemption policies have increased utilization of delivery services and helped the poorest women access needed obstetric care;
- The quality of services was poor and remained unchanged by the exemption policies;
- Transportation, cultural, social, and other financial barriers remained and impeded access to skilled care; and
- While implementation was more or less successful, lack of funding and institutional ownership compromised sustainability of the policy in the long run.

In Mali, a thorough review of available articles and documents⁶ identified key factors influencing access to critical maternal health services. Commonly cited barriers to care include willingness and ability to pay, lack of transportation and distance from the facility, doubts about the quality of treatment and its perceived benefit, and lack of education and other cultural factors. In Mali, these barriers have been insurmountable for many women, especially women of low SES and women living in rural areas.

Willingness and ability to pay: Lack of money was cited as the principal barrier to seeking delivery care among women in 53 percent of cases in Mali, according to the 2006 DHS (Macro International 2007). As a result, the richest quintile benefited from skilled attendance at delivery in 50 percent more births than did the poorest quintile. In fact, total expenses incurred in seeking maternal health care far surpass the direct cost of services. Informal payments, in addition to the formal payment of user fees at the point of service, constitute a significant portion of out-of-pocket expenditures. These informal payments may be costs not directly associated with the service itself such as transportation and accommodation fees; payments for unmet costs such as supplies or medicines; as well as payments made directly to staff for higher-quality care, shorter wait times, or as a general condition of service (Sharma et al. 2005). The opportunity cost of spending time in transport and at the health facility for poor women and their companions further burdens households.

⁶ See Health Systems 20/20 and ATN Plus 2009 for more detail.

Geographic barriers to care: Poor road conditions, long distances to health facilities, lack of public transportation, and poor availability of emergency transport exacerbate existing inequities in access to quality maternity care in Mali. Distance to health care facilities and the need for transportation were cited as barriers to care by 38 percent and 36 percent, respectively, of women surveyed in the 2006 DHS. Long delays – sometimes up to 10 hours - between the decision to evacuate and arrival at the facility have been cited as a significant contributor to maternal mortality in certain hospitals (Bengaly, 2008).

Quality of care: Lack of confidence in health services and doubts about the availability and quality of care contribute to delays in seeking maternal health care and low levels of service utilization in Mali. This lack of trust may arise from the unavailability of cheap drugs, an unwelcoming environment, under-the-table payments for services, poor treatment by staff, lack of skills and professionalism on the part of staff, or a general lack of protocol. Regardless of the cause, dissatisfied patients give up on health facilities and turn to self-care and traditional practices. Problems with availability and quality of trained personnel further compound concerns about the quality of care and lead to low levels of service utilization. Worsening the problem, health care workers are not distributed evenly throughout the country: they are heavily concentrated in Bamako while other regions face great shortages of doctors, midwives, and nurses. It is not surprising then that very few births are attended by a physician and that the coverage of professional services remains very low.

Education and cultural and social factors: Rates of assisted delivery were above 90 percent for women with at least a secondary-level education compared with 44 percent for women with no formal education. Caesarean rates were almost five times greater for highly educated women (Macro International 2007). Many women in Mali have little or no say in their health care needs. Three quarters of Malian women said their husbands alone made the decisions regarding their health care (UNICEF, 2008). In the 2006 DHS, 18 percent of women cited lack of permission to seek care as a barrier to the uptake of maternal health care and 24 percent of women said that the fact that they did not wish to go alone was a barrier. Cultural preference for traditional birth attendants may also be a factor that influences uptake of maternal health care.

Recognizing the problem of geographic barriers, the government of Mali established a system of referral and emergency transport for obstetric emergencies. This involved setting up means of communication between CSCom and CSRef, arranging for transport by ambulance, monitoring the quality and availability of care at the referral level, and ensuring financial viability through a cost-sharing mechanism. Funding for the referral system came partially from the MoH and partly from a solidarity fund with contributions from the household, the local ASACO, and the referral facility. While the system improved both the financial and physical accessibility of obstetric care throughout Mali, implementation has been slow and geographical barriers persist.

Against this backdrop of information, this study examines changes in service utilization following the caesarean fee exemption policy and looks deeper into remaining barriers to accessing obstetric services for women in Mali. The section that follows discusses the various methods we use to conduct the research.

3. METHODOLOGY

3.1 STUDY METHODS

We used a combination of qualitative and quantitative methods to explore the research questions listed above in section 1.2. These included:

3.1.1 QUANTITATIVE METHODS

- **HMIS Analysis: Analysis of data from public sector facilities**, using information from the HMIS (known in Mali as the *Système d'Information Sanitaire*, or SIS) as well as information on caesareans from the *Division Santé de la Reproduction / Direction Nationale de la Santé* (DSR/DNS). We use these data to observe trends in indicators such as normal deliveries, caesarean rates, and maternal and neonatal mortality outcomes.
- **SES Analysis: Analysis of socioeconomic data collected from beneficiaries post policy in selected public facilities in all regions of Mali, including Bamako** (see section 3.2.1 for the selection of facilities). Between February and September 2010, we collected basic demographic and socioeconomic data upon discharge from women who had normal deliveries (in selected CSCom), as well as from women who had caesarean sections (in selected hospitals and CSRef). We created a proxy wealth index for estimating a woman's SES using weighted answers to a set of five questions. These questions are a subset of those used to identify wealth quintiles in the Mali 2006 DHS. They are a mix of asset variables that typically vary across income groups as well as some variables defining living circumstances that are specific to the Malian context (see Annex B for the methodology used to construct the wealth index). Using the individual female dataset from the 2006 DHS, we identified cutoff values of the wealth index that defined women belonging to tertiles of the wealth distribution, each containing one third of the population. We then constructed the same proxy wealth index based on responses we obtained in our own SES survey and used the same DHS cutoff values to classify respondents by wealth tertile. For ease of reference, we define the first tertile as the low SES group, the second tertile as the middle SES group, and the third tertile as the high SES group.

3.1.2 QUALITATIVE METHODS

- **Facility Analysis: Analysis of facility data collected using interviews with key personnel in selected public facilities as well as key stakeholders.** Using three questionnaires, we collected information on policy implementation at the facility level, particularly with regards to the functioning of the referral system, the availability and adequacy of caesarean kits, and the quality of services performed. The interviews also explored opportunities and challenges of the policy, as perceived by facility staff. The questionnaires were administered to various cadres of staff (facility director, midwife, gynecologist or surgeon, head of operating room, caesarean point person, HMIS manager, anesthesiologist, pharmacist, laboratory head, and accountant). In CSCom (which do not perform caesareans), the focus was predominantly on the referral system including an interview with the facility director, the head of the maternity unit, and the person in charge of the pharmacy.

In addition, we conducted a number of in depth interviews with various stakeholders and political actors to gather views and opinions on the policy and its impact. They included mayors and ASACO members, regional health directors, and representatives from the DSR, Administrative and Finance Directorate (DAF), Directorate of Pharmacy and Drugs (DPM), and the Malian Drug Organization (PPM) of the MoH.

- **Community Analysis: Analysis of qualitative data collected using FGD and in-depth interviews with women and other community members.** We designed a number of instruments for the FGD, with the objective of exploring the community members' knowledge of the free caesarean policy, their awareness of costs associated with caesareans, their perception of the quality of services, challenges with their access to maternal health services, and their recommendations going forward.

3.2 SAMPLING DESIGN

3.2.1 SELECTING FACILITIES

For the purpose of this study, we treated Bamako city as a region. We thus had a total of nine regions. We used stratified random sampling to select facilities in each region, as follows:

- *1 Hospital:* We automatically included the regional hospital in the sample. We purposively selected Gabriel Toure hospital (a tertiary facility) to be included in the facility sample for Bamako as no regional hospital exists in Bamako. Koulikoro and Kidal do not have a regional hospital. The CSRef in these cities act as the regional hospital.
- *2 CSRef:* We divided the CSRef in each region into two groups based on the 2008 caesarean rates in that region – those with caesarean rates above the median for the region and those below the median. We then randomly selected 1 CSRef from each group. At the time of the sampling design, none of the CSRef in Kidal had any registered caesarean procedure. We thus excluded CSRef from the sample in Kidal (except the one CSRef that acts as the regional hospital).
- *2 CSCom:* Using the list of CSCom in 2008, we randomly selected 1 CSCom for each CSRef included in the sample.

Given the exclusions in Kidal, the total sample size is 41 facilities distributed as follows: six regional hospitals (Kayes, Segou, Sikasso, Mopti, Tombouctou, Gao) and two regional CSRef (Kidal and Koulikoro); one tertiary hospital in Bamako; 16 CSRef and 16 CSCom in all regions except Kidal (see Annex C for a complete list of facilities in sample). We administered the facility questionnaires to a total of 267 facility staff.

3.2.2 SELECTING FGD PARTICIPANTS

We conducted FGD at the community level in villages where a sampled CSCom, was present. We formed four types of discussion groups in each village:

- Group 1: Married women aged 15-49 who gave birth in a health facility (n=54).
- Group 2: Married women aged 15-49 who gave birth outside a health facility (n=38).
- Group 3: Women aged over 50 (such as mothers-in-law) (n=59).
- Group 4: Married men, over 40 (n=55).

We chose the District of Bamako to represent urban areas and selected three regions to represent rural areas. These included the North (Tombouctou), Center (Mopti), and South (Kayes). For each CSCom, we randomly selected two villages: a first village within a radius of 5 km from a facility (near) and a second located within a radius of more than 15 km from a facility (distant). In each village, we held two FGD. We also held in-depth interviews with women who had had caesareans and were part of the FGD. In the end, we held a total of 32 FGD sessions with 206 participants and interviewed 11 women who had had caesareans.

3.2.3 SAMPLING AND WEIGHTS FOR SES DATA

We determined the sample size for the SES data collection to yield estimates of the indicators of interest with a margin of error of plus or minus 5 percentage points. These key indicators included the proportion of deliveries by low SES women out of the total number of deliveries at health facilities, and the proportion of caesareans performed among low SES women out of the total number of caesareans performed. We assumed that the proportion of caesareans among the poorest fifth of the population is around 12 percent of all caesareans, as estimated using the 2006 DHS. Based on these considerations, a minimum sample of 245 deliveries was required from each of the nine regions. We collected data for all women delivering at each hospital, CSRef, or CSCom in our sample of 41 facilities. Data collection started in February 2010 and was supposed to continue until we reached the minimum target in all regions. When it became clear that the northern regions (more specifically Kidal, Gao, and Tombouctou) would not achieve the 245 target size given budgetary reasons and time constraints, we decided to stop data collection in September 2010. These regions are combined into one representing the Northern regions for data analysis (see section 4.2). The final sample collected totaled 3,968 records.

We computed sampling weights to reflect the probability of selection into the sample and to allow for generalizing to the population from which the sample was drawn. Women were selected using two-stage sampling. In each region, facilities were selected first (section 3.2.1) and then all women who delivered during the eight-month period were selected. We assigned a sampling weight to each facility, equal to the inverse of the probability of being selected into the sample. Note that the weight differs by type of facility. For a hospital, for instance, the weight is equal to 1 since the only regional hospital in each region was selected with certainty. We adjusted for the relative patient load at each type of facility by multiplying the weights by an adjustment factor.⁷ Finally, since every women delivering in a sampled facility was included, all women in the same facility receive the same adjusted facility weight. A negligible number of women refused to provide information, so there was no need for non-response adjustment. We use these weights for all statistical analyses related to the SES data and presented in this report.

⁷ Adjustment is made by multiplying the weights by the ratio

$$r = \frac{X}{\hat{X}}$$

Where \hat{X} is the weighted number of deliveries in all facilities in the same frame as the selected facility, and X is the known number of deliveries in all these facilities.

Table 1 summarizes the survey methods employed and the sampling done for each.

TABLE 1: SUMMARY OF SURVEY METHODS AND SAMPLING

Survey Method	Location	Respondents
Facility surveys	9 regions, 41 facilities	267 health providers
Stakeholders' interviews	9 regions	47 stakeholders
Community FGDs	4 regions, 8 villages, 32 FGDs	206 participants
In-depth interviews	4 regions, 8 villages	11 women who had a caesarean
SES survey	9 regions, 41 facilities	3,968 women

3.3 DATA COLLECTION AND ANALYSIS

Several survey teams from the *Centre d'Appui à la Recherche et à la Formation (CAREF)*, an independent research organization in Mali, conducted the facility surveys, the in-depth interviews, and the FGDs between December 2009 and February 2010.

HMIS personnel and the caesarean point persons at each facility were responsible for collecting the SES data from women upon discharge. National and regional trainers, who were originally trained by a project consultant in October 2009, trained facility personnel on the proper use of the SES data collection forms during regional workshops held in January-February 2010.

The FGDs and in-depth interviews were tape-recorded, transcribed, and analyzed using MaxQDA software. Facility and SES data were captured in SPSS and Excel with some converted to STATA for analysis. Each set of data (HMIS, SES, facility, and community) was analyzed and reported separately (see section 1.3).

3.4 ETHICAL CONSIDERATIONS

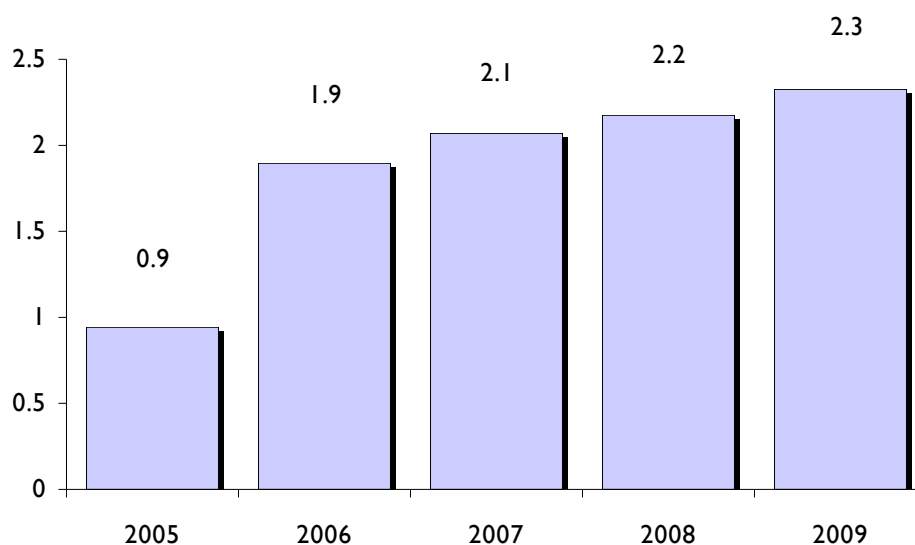
The research protocols and instruments for the facility surveys and the FGDs were approved by the Abt Associates Institutional Review Board and the national ethics committee in Mali, known as the *Comité National d'Ethique pour la Santé et les Sciences de la Vie (CNESS)*. Every person associated with this study (data collection, translation, information handling) signed a confidentiality agreement to maintain confidentiality and anonymity of the data. All FGD participants, facility survey interviewees, and recently delivered women were asked to provide written consent before participation and were free to decline to participate. Interviewers read the information provided in the consent form in French and in the local language. The consent form stressed the voluntariness of participation and that the information collected would be kept confidential. All information collected was de-identified before being analyzed. Tape recordings are not identifiable by name. All records will be securely kept inside the ATN Plus office in Bamako and for three years after all data collection activities and analysis have been completed. Only a few pre-authorized research staff will have access to these materials. After three years, the paper forms and audio recordings will be shredded and destroyed.

4. MAIN FINDINGS

4.1 TRENDS IN INSTITUTIONAL DELIVERY RATES AND CAESAREAN SECTIONS

Since the launch of the free caesarean initiative, institutional deliveries and caesarean section rates in Mali have increased. Between the start of the policy in 2005 and 2009, the estimated population-based caesarean rate⁸ in Mali has more than doubled – from 0.9 percent of all deliveries in 2005 to 2.3 percent in 2009 (Figure 1). This increase is apparent in all nine regions (Figure 2) and in all health districts in each region (see Table D1 in Annex D). Most significantly, rates tripled in Kayes, Sikasso, Mopti, and Tombouctou. While small, these increases in access to life-saving obstetric care may bring Mali strides closer to meeting maternal mortality targets. Nonetheless, Mali has fallen short of the target caesarean section rate of 4 percent set in PRODESS II in 2008 (Ministère de la Santé, 2009b). In particular, although every region has made considerable progress, some regions still have rates below 1.5 percent, indicating continued critical unmet need for life-saving obstetric care.

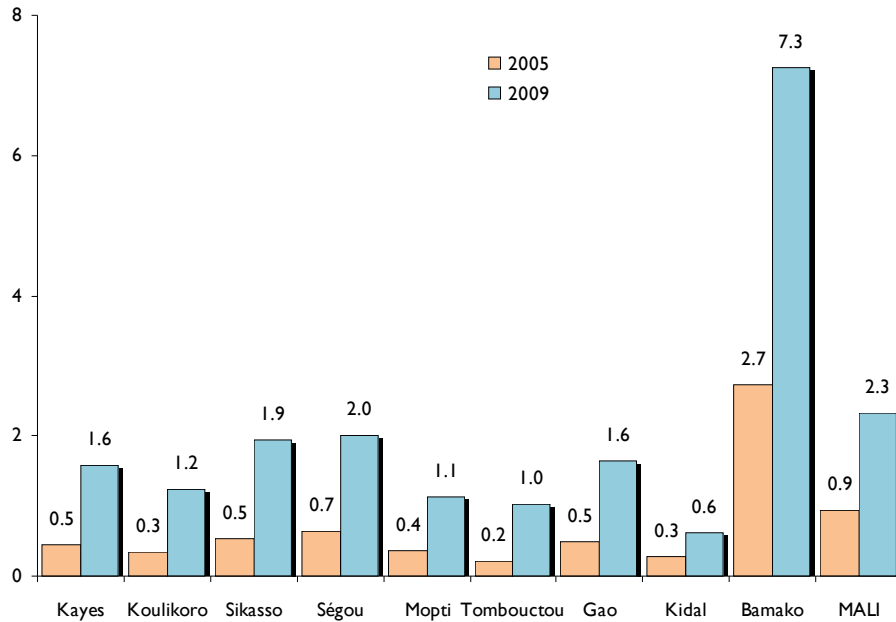
**FIGURE 1: TRENDS IN CAESAREAN RATES IN MALI, 2005-2009
(AS A PERCENTAGE OF EXPECTED DELIVERIES)**



Source: HMIS data, 2005-2009

⁸ Caesarean rates are calculated by dividing the total number of caesareans by the total number of expected deliveries in a year. The latter is estimated based on an expected fertility rate of 5 percent of total population.

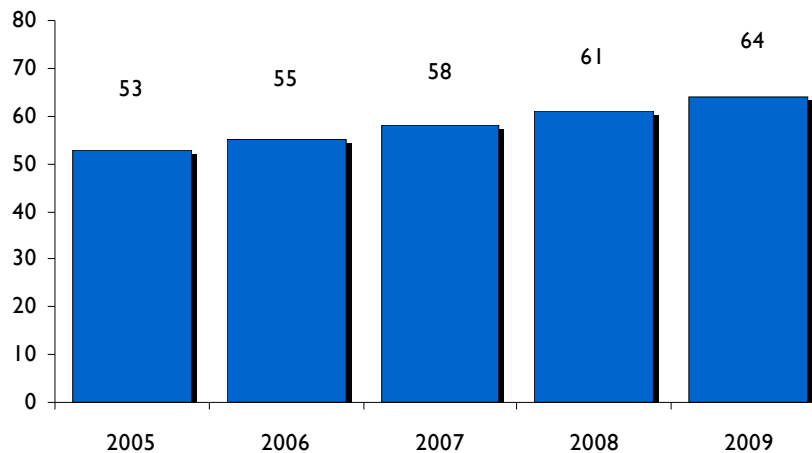
**FIGURE 2: TRENDS IN CAESAREAN RATES BY REGION, 2005-2009
(AS A PERCENTAGE OF EXPECTED DELIVERIES)**



Source: HMIS data, 2005-2009

Facility deliveries have also increased, from 53 percent (of total expected deliveries in the population) in 2005 gradually to 64 percent in 2009 (Figure 3). This is also observed in all regions and districts. The largest increases were in Kidal (from 18 to 29 percent), Kayes (from 40 to 58 percent), and Tombouctou (from 24 to 33 percent) (see Table D2 in Annex D). While it is difficult to fully attribute this increase to the free caesarean policy, the existence of the policy may have motivated more women to seek health care in facilities. In fact, community focus groups reported an increase in utilization of maternal health services, most notably antenatal care.

**FIGURE 3: TRENDS IN INSTITUTIONAL DELIVERY RATES IN MALI, 2005-2009
(AS A PERCENTAGE OF EXPECTED DELIVERIES)**

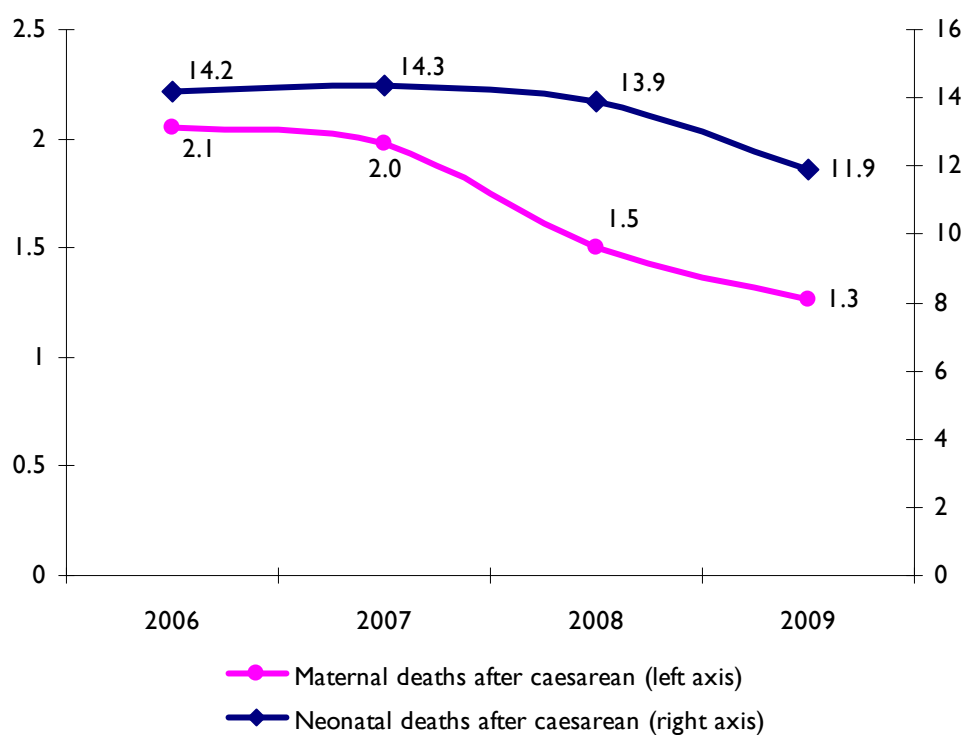


Source: HMIS data, 2005-2009

Post-caesarean maternal and neonatal deaths declined in most regions from 2006 to 2009.

The proportion of caesarean procedures that resulted in maternal deaths declined from 2 percent in 2006 to 1.3 percent in 2009 and the proportion resulting in neonatal deaths declined from 14 percent in 2006 to 12 percent in 2009 (Figure 4). The largest decreases in maternal deaths were seen in Koulikoro (from 3.6 percent to 1 percent) and Sikasso (from 2.4 percent to 0.85 percent). These improvements may be attributed to shorter delays experienced at facilities. With families no longer spending time mobilizing resources to cover costs, wait times upon arrival at the facility have decreased from an average of 45 minutes to an average of 15 minutes per patient (DSR/DNS). This has improved survival chances for both the mother and the baby. Families may also be deciding more quickly to go to a health facility for emergency care.

FIGURE 4: TRENDS IN MATERNAL AND NEONATAL DEATHS AFTER CAESAREANS (AS A PERCENTAGE OF CAESAREANS)



Source: HMIS data, 2005-2009

There is no indication that unnecessary caesareans have increased since policy implementation. Caesarian rates are still low by international standards – the highest rate in Bamako (7.3 percent) remains within the WHO estimated minimal required range of 5–15 percent of deliveries. Importantly, the policy does not provide any incentive for performing unnecessary caesareans. Caesarean procedures can only be performed when a health provider (and not the patient) determines that they are clinically necessary, and the policy does not provide any monetary or non-monetary incentive to providers for performing the procedure.

4.2 CAESAREANS AND SOCIOECONOMIC STATUS

We collected basic demographic and socioeconomic data from a total of 3,968 women who had normal deliveries or caesarean sections in our sample of facilities between February and September 2010. Table 2 shows the total number of records collected according to region and facility type.

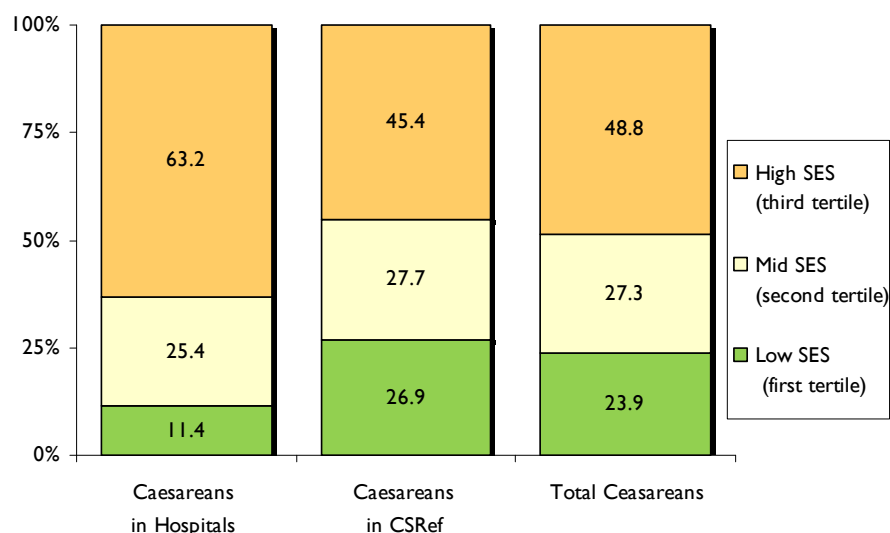
TABLE 2: SES SAMPLE SIZE BY REGION AND FACILITY TYPE

Region	Hospital (# caesareans)	CSRef (# caesareans)	CSCoM (# normal deliveries)	Total (All)
Kayes	249	132	91	472
Koulikoro	153	96	229	478
Sikasso	222	68	202	492
Ségou	157	187	248	592
Mopti	20	91	128	239
Tombouctou	37	55	64	156
Gao	63	42	47	152
Kidal	13	0	0	13
Bamako	222	670	482	1,374
Total	970	1,507	1,491	3,968

Because of low utilization, we were not able to reach the target sample size (245 deliveries) in the Northern regions of Tombouctou, Gao, and Kidal during the eight-month period of the survey. In the analysis that follows, we combine these regions into one, representing the Northern regions of Mali. We disregarded the fact that Mopti fell slightly short of the target sample size.

An estimated 23.9 percent of women delivering via caesarean section in public health facilities belong to the low SES group (poorest third of the population). Broken down by facility type, the ratio is 11.4 percent of women delivering by caesarean in hospitals and 26.9 percent of women having caesareans in CSRef (Figure 5). An estimated 63.2 percent of women having caesareans in hospitals belong to the high SES group (wealthiest third of the population), as compared to 45.5 percent in CSRef.

FIGURE 5: PERCENTAGE DISTRIBUTION OF CAESAREANS BY FACILITY TYPE AND WEALTH STATUS

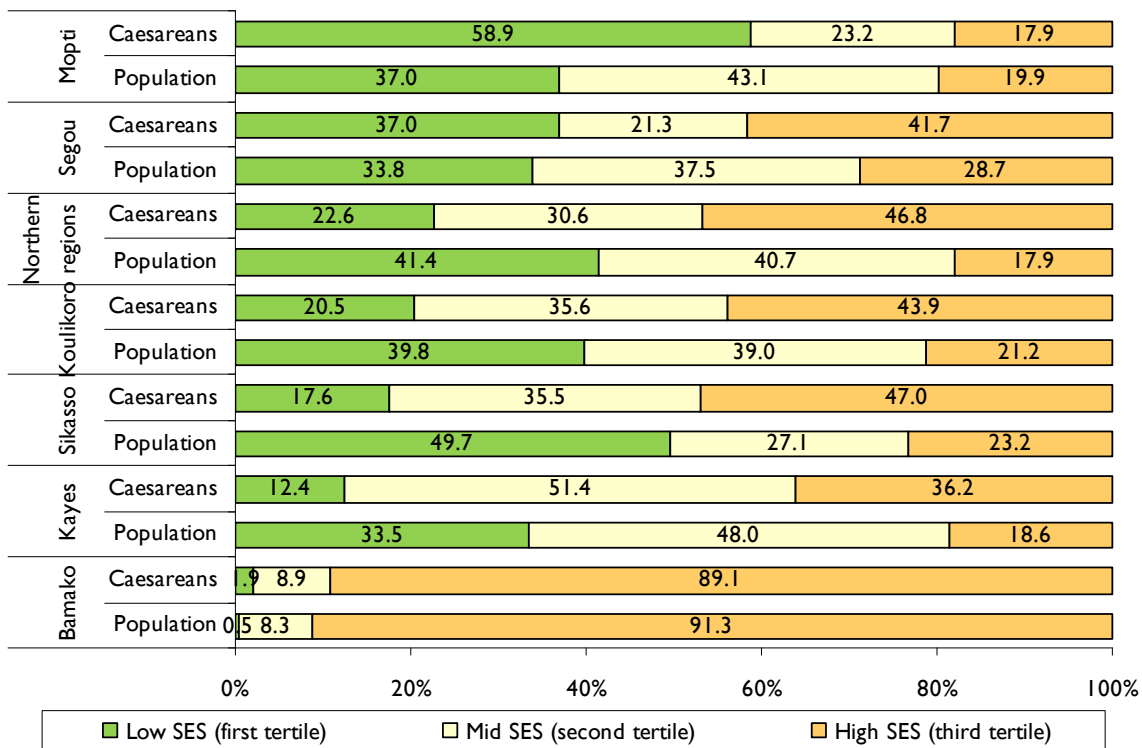


Source: SES data, 2010

If access to caesarean sections were equal among different SES groups, we would expect the wealth distribution of women receiving caesareans to be roughly the same as the wealth distribution in the overall population. In other words, we would expect roughly one third of women receiving caesareans to belong to the low SES group. However, only 23.9 percent of women receiving caesarean sections belong to the low SES group whereas almost half of women receiving caesareans (48.8 percent) belong to the high SES group (richest third of the population). This skewed distribution of caesareans implies that the free caesarean policy seems to be disproportionately benefiting the wealthier groups, suggesting remaining barriers to access among women of low SES.

Figure 6 shows the regional breakdown of caesareans according to wealth status, compared with the wealth distribution of the total population in each region (estimated using the DHS 2006 data). We use the wealth distribution of each region’s population as a comparator to evaluate the degree of use of caesarean services by women in the various SES groups, since the wealth distribution is not equal across regions in Mali.

FIGURE 6: PERCENTAGE DISTRIBUTION OF CAESAREANS BY WEALTH STATUS AND REGION



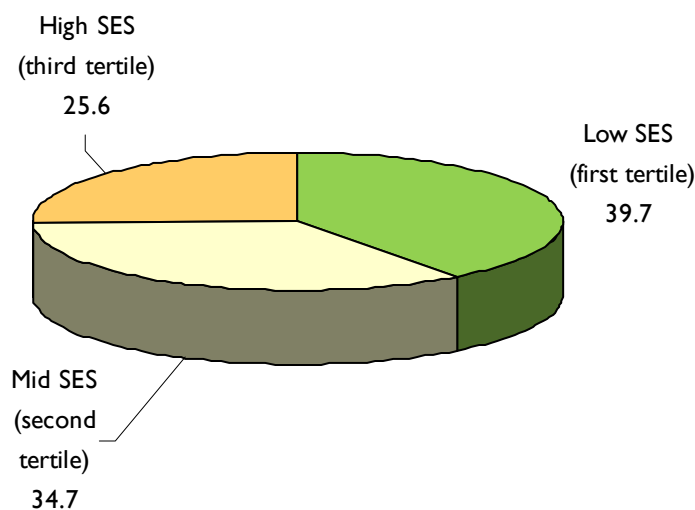
Note: Northern regions include Kidal, Gao and Tombouctou.
Source: SES data, 2010 and DHS, 2006.

Figure 6 indicates that in most regions, fewer women of low SES are receiving caesareans than what we would expect given their share of the overall population. This underrepresentation is most severe in Kayes (12.4 percent of caesareans are of low SES compared with 33.5 percent in the region’s population), Sikasso (17.6 percent compared with 49.7 percent), Koulikoro (20.5 percent compared with 39.8 percent), and the Northern regions (22.6 percent compared with 41.5 percent). In contrast, in Mopti, women of low SES appear to be benefiting well from the free caesarean policy, incurring a larger share of caesareans performed (58.9 percent) than they represent as a proportion of the population (37 percent).

Note that this analysis does not take into account those who use private sector facilities. However, only 2.4 percent of all deliveries occur in private facilities in Mali (according to the 2006 DHS). Most deliveries either occur at home or in a public facility.

An estimated 39.7 percent of women who had normal deliveries in CSCoM belong to the low SES group (Figure 7). The survey gathered information on normal deliveries in CSCoM only (information on normal deliveries in CSRef and hospitals was not collected). Because this sample is restricted to CSCoM patients and excludes normal deliveries in CSRef and hospitals, we are not able to perform the same type of comparative analysis that we did with the caesarean sample above, and we therefore are not able to evaluate equity in facility use for normal deliveries across wealth groups. We can hypothesize that women of low SES tend to frequent CSCoM as opposed to higher levels of facilities. In any case, the ratios shown in Figure 7 may serve as baseline values for additional studies in the future.

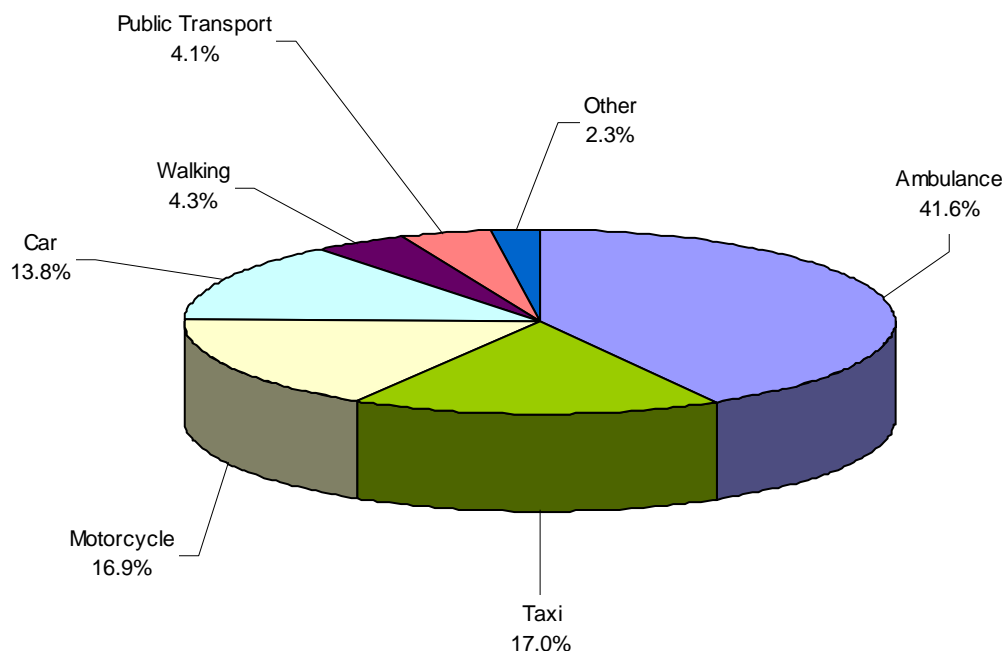
FIGURE 7: PERCENTAGE DISTRIBUTION OF NORMAL DELIVERIES IN CSCOM BY WEALTH STATUS



Source: SES data, 2010

The SES survey collected additional information on the mode of transportation used to reach the facility and the use of the referral system. Figure 8 shows that the most common way to get to a CSRef or hospital for a caesarean procedure is the ambulance (42 percent), followed by taxis or motorcycles (17 percent), then cars (14 percent). Four percent reported walking to the facility or using public transport (e.g. bus). Regionally, ambulances are mostly used in Kayes, Mopti, and Segou (58 percent, 54 percent, and 47 percent respectively), while taxis are largely used in the urban areas (Bamako, 55 percent) and motorcycles are more common in Segou (38 percent) and Sikasso (27 percent). Thirteen percent of women in the northern regions of Mali reported walking to the facility.

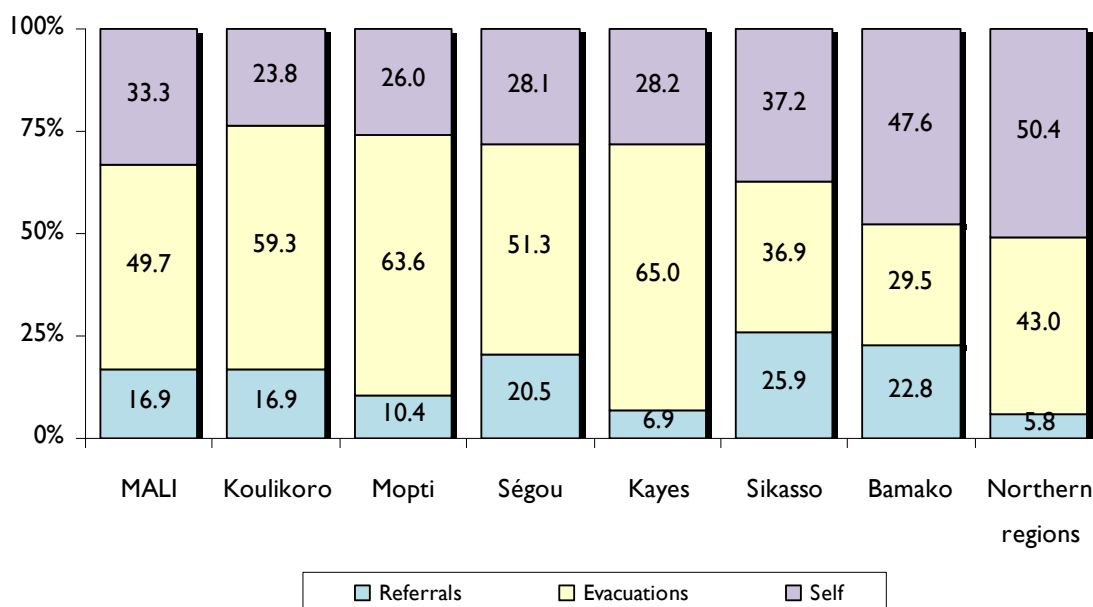
FIGURE 8: PERCENTAGE DISTRIBUTION OF MODES OF TRANSPORTATION TO CSREF AND HOSPITALS AMONG WOMEN WHO UNDERWENT CAESAREANS



Source: SES data, 2010

Figure 9 shows that for all women who underwent a caesarean in either hospitals or CSRef, 67 percent were either transported by ambulance or referred from a lower-level facility. This shows that the referral system is working fairly well. However, 33 percent of women are still self-referring directly to higher-level facilities. This finding is particularly pronounced in Bamako, Sikasso, and the Northern regions.

FIGURE 9: MODES OF ADMISSION TO CSREF AND HOSPITALS AMONG WOMEN WHO UNDERWENT CAESAREANS, BY REGION



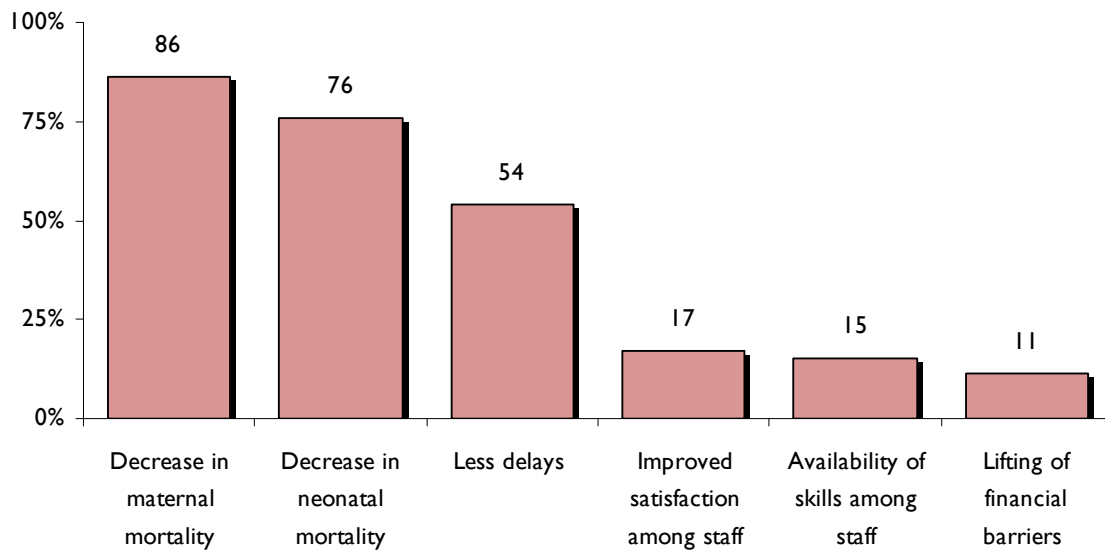
Source: SES data, 2010

4.3 FACILITY CONDITIONS AND POLICY IMPLEMENTATION⁹

We conducted surveys and interviews with key personnel in 41 public facilities as well as key stakeholders. The purpose was to better understand the ways in which the caesarean policy has been implemented at the facility and explore views of staff with regard to opportunities and challenges they face. A detailed analysis of the results is found in the *Facility report*. Key findings are highlighted below.

The vast majority of providers interviewed at various levels of care favored the free caesarean policy. Among the advantages cited were the impact on reducing maternal and neonatal mortality (reported by 86 percent and 76 percent of providers, respectively), reduced delays in case management (54 percent), improved morale and satisfaction among staff (17 percent), and the lifting of financial barriers among the poor (11 percent) (Figure 10). Only 2 percent of providers indicated that the quality of their work has declined. However, over a quarter (27 percent) reported difficulties with work overload (not shown in figure).

FIGURE 10: POSITIVE ASPECTS OF THE FREE CAESAREAN POLICY ACCORDING TO FACILITY PROVIDERS (AS A PERCENTAGE OF PROVIDERS)



Source: Facility survey

In general, providers and stakeholders thought most Malians are aware of the existence of the free caesarean policy but remain confused about its various features. According to providers and stakeholders interviewed, while the majority of the population has heard of the free caesarean policy, communities have been misinformed about the specific elements of the policy, such as the roles and responsibilities of the various involved groups and what is free under the policy and what is not. This was also clearly evident during the FGDs with community members and households (discussed below in section 4.4).

⁹ See *Facility report* for more detail.

The referral and emergency transport system for obstetric emergencies remains one of the weakest elements of the free caesarean policy.

According to interviews with ASACO members, more than half of the solidarity funds are not functioning. Solidarity funds have been created as a means to cover transport-related costs, such as small repairs, drivers' fees, and gas costs, for transporting women from the CSCom to the CSRef. They are financed through contributions from the ASACO, the mayor's office, and the district council. Many respondents believed that the lack of community participation was primarily due to extreme poverty and lack of sufficient funds within households. Others condemned the general lack of awareness of the community's role under this policy. While both views may be valid, the absence of functioning solidarity funds has shifted transportation costs onto the household, in many instances creating a significant financial burden (an estimated 15,000 to 20,000 FCFA or US\$30 to US\$40). The extreme poor are therefore excluded, and this may be one of the reasons why they are not benefiting as fully from the policy as expected.

"Only 10 out of 26 ASACO are up to date on their payments to the solidarity fund. Not one city office (mairie) has paid its share"

ASACO President

Problems with referrals are further aggravated by weak communication linkages between the CSCom and the CSRef. Only two CSCom from the District of Bamako have a working telephone and less than half of all CSCom in the sample have a functioning radio network known as the *Réseau Autonome de Communication (RAC)*. Seven out of 16 CSCom have neither a RAC nor a working phone. Half of the CSRef (eight out of 16) have a functional RAC, while three of them have no working telephone.

Infrastructure and road problems pose significant constraints for those living in remote and isolated areas. The vast majority of providers and key stakeholders rated road conditions as 'extremely bad' during the rainy season, thus limiting access to health facilities and emergency obstetric care. This was corroborated during the FGDs with community members (see section 4.4).

A shortage of blood banks in facilities performing caesareans poses significant health risks. Blood transfusion is a problem almost everywhere. Ten out of 25 facilities do not possess any blood bank. Nineteen of the 23 facilities for which information is available reported frequent problems in meeting the needs for blood transfusion for women delivering via caesarean section. A few health professionals reported some patient deaths due to the lack of emergency transfusions.

Many providers reported problems with the state-provided caesarean kits, including frequent stock-outs, insufficient amount of drugs, and sometimes obsolete products. A large number of respondents complained about the quality and quantity of the products included in the kits. Midwives in particular (about 50 percent of those interviewed) said the complicated caesareans kits did not have enough of the necessary drugs. One third of surgeons and anesthesiologists

"Here, cases we see are often complicated. The patient spends more than 5 days recovering while the kits include drugs sufficient for 5 days only."

"The antibiotics are insufficient"

"Anesthetic products do not take into account cases of hypertension"

Facility surveys

interviewed were dissatisfied with the quantities and types of products included in the kits. A large number of officers (18 out of 22) at district drug warehouses or *Dépôt Répartiteur de Cercle (DRC)* reported the presence of obsolete or almost expired products in the kits. To overcome these difficulties, the district warehouses assemble missing items in the kits using the facilities' products to meet the needs of surgical teams to perform caesareans. It is notable that there were no reported cases in which a caesarean was not performed because of the lack of a caesarean kit.

Despite general confidence in the existing technical and surgical skills of staff, health providers indicated a need for additional human resources. Only nine out of 25 managers and 10 out of 21 surgeons interviewed said they were satisfied with the availability of staff for caesareans. Obstetric nurses are particularly in need.

A significant number of health staff and stakeholders interviewed remained skeptical about the sustainability of the free policy. Health workers believe that the policy marks a significant shift away from the Bamako Initiative, a cornerstone of cost recovery arrangements that have been in place in these facilities for decades. While the majority of those interviewed recognize the merits of the free policy, some are concerned with the perverse effect of the policy on the financial sustainability of facilities.

4.4 VIEWS FROM HOUSEHOLDS AND COMMUNITY MEMBERS¹⁰

We conducted 32 FGD in 8 villages in four selected regions in Mali (Tombouctou, Mopti, Kayes, and Bamako District). A total of 206 people representing various groups (women who delivered in a facility, women who delivered outside a facility, women over 50 years of age, and men over 40) participated in the discussions. A detailed analysis of the results is found in the *Community report*. Key findings are highlighted below.

The free caesarean policy is becoming increasingly well known although information about the specific components of the policy remains fragmented. This confirms claims made by facility staff (see section 4.3). Sources of information on the policy mainly include media outlets (radio or TV), health facility staff, and community health workers. However, it appears that specific information on the free policy has not reached different groups in the same way. Levels of understanding vary from one locality to another and from one type of media to another. For instance, there is no common understanding on what is covered by the policy and what levels of facilities possess the technical capabilities to perform caesareans.

To the extent that it has removed important financial barriers, the caesarean policy has been well received in the community. The responses gathered through the FGD and in-depth interviews suggest that people perceive that the poor are among those who benefited the most from the free policy. Many considered caesarean costs as catastrophic expenditures for the family and expressed relief that the costs are waived. Some responses also suggest that the policy has encouraged higher utilization of health services at the facilities, including pre-natal care and assisted deliveries.

“Before the policy, a caesarian would be considered disastrous news to the family. Now with the free initiative, everyone can benefit from caesarians even if they do not possess the means.”

FGD, men

“With the free policy, many women are visiting health facilities. The change is very noticeable. Women who deliver at home usually do so because of a short labor. We always tell our daughters-in-law that we prefer that they deliver at health facilities.”

FGD, women over 50

“Walahi! (certainly), we learned about the free policy but paradoxically, the costs of prescription drugs come back even higher than the costs of a caesarian procedure... In this case, can we really say that there was a reduction of fees?”

FGD, men

“Actually, we are not very far from a health facility, but access is not easy because of road conditions. Particularly so during the winter season, we have to cross more than 5 kilometers in a cart (charrette) to get to the health facility... It is dangerous! In fact some women die on the way.”

FGD, men

¹⁰ See *Community report* for more detail.

Respondents however expressed dissatisfaction over the high costs of prescription drugs.

Many respondents, especially men, complained of the large expenditures associated with drugs, which some have argued are as high (if not higher) as the actual costs of a caesarean.

High transportation costs and difficult road conditions continue to be the main deterrent to accessing health facilities.

Transporting women in labor to health facilities poses many difficulties in both urban and rural areas. This is due to a combination of factors: First, the lack of proper means of transportation forces many women to walk while in labor in order to get to the health facility. Second, the cost of transportation is more than what some families can afford. Whether it is through the use of borrowed carts known as *charettes* in rural areas (estimated to cost around 1,000-2,500 FCFA, or around US\$2-\$5), or the use of taxis in urban areas (estimated to cost no less than 3,000 FCFA, or US\$6), or the use of ambulances (with fees estimated between 12,500 and 15,000 FCFA, or US \$25-\$30), many families are simply unable to mobilize the funds necessary to reach health facilities. Poor and inadequate road conditions, especially during the winter season, add additional constraints and delay immediate care.

Opinions on the quality of the services at health facilities are mixed and vary by case.

While many expressed satisfaction with the quality of services received, others complained about the absence of competent staff and inappropriate attitudes toward women in labor, the latter most predominantly observed in rural areas.

Socioeconomic and cultural factors are still driving low utilization of maternal health services.

Poverty and lack of means were cited as the predominant reasons behind the high prevalence of home-based deliveries. Illiteracy and the lack of awareness of the benefits of antenatal care and assisted deliveries are also important. Finally, cultural factors play an important role, especially in rural areas, where husbands largely influence the choice of where to deliver and communities do not highly regard those women who deliver at health facilities.

A few suggestions were made to improve access to maternal health services.

These included decreasing the costs of prescription drugs related to caesareans, extending the free policy to normal deliveries, providing permanent and reliable transportation systems from villages to CSCom especially in remote areas, encouraging communities to use facility services more frequently, and finally, improving the quality of service and the attitudes of health providers toward women delivering in facilities.

“Actually, health workers are irreproachable with their work. As soon as you present yourself with a woman in labor, the staff immediately mobilizes to take charge of the patient.”

FGD, women over 50

“I personally did not like the quality of care provided, because once I lost my baby despite having had ante-natal care at the health center for 8 months”

FGD, women group 2

“Here, in our culture, giving birth at home is synonymous to bravery... it shows that the mother is physically strong. On the other hand, giving birth at a facility is perceived to be a sign of weakness. Thus, for us, unless the woman is ill, she does not deliver at a health facility.”

FGD, women group 1

“I ask the authorities to set up a permanent transportation system in the village to ensure the transport of the patient in case of an emergency.”

FGD, men

5. CONCLUSIONS AND RECOMMENDATIONS

The primary objective of the free caesarean policy introduced in 2005 by the government of Mali is to reduce financial barriers for accessing emergency obstetric care and ultimately improve maternal and neonatal health indicators. Policymakers are interested in exploring the effect of the policy on the ground and examine remaining barriers in order to inform future policy decisions. Using a wealth of data and information gathered through surveys and interviews with facility staff, community members, and other key stakeholders, this study assessed changes in access to caesareans – especially among women from lower SES groups – since policy implementation, and identified persistent bottlenecks.

Despite the fact that caesarean rates in Mali remain well below the WHO-estimated minimal required level of 5 percent of deliveries, our findings suggest that in general the policy has started to have an effect. There has been a steady increase in caesarean rates since 2005. Among those delivering via caesarean, there has been a decline in maternal and neonatal mortality. Rates of institutional deliveries, which include normal deliveries, also increased between 2005 and 2009. While it is difficult to fully attribute this increase to the free caesarean policy, the existence of the policy may have motivated more women to seek health care in facilities. Across the board, service providers, communities, and local political actors support the free policy, and perceive that it benefits the economically disadvantaged and increases their access to emergency obstetric care.

Notwithstanding this progress, women from lower SES groups seem to be benefiting less from the policy than their wealthier counterparts, suggesting that financial barriers remain in spite of the policy. Reports from community focus groups indicate that high transportation and other indirect costs are indeed preventing many from accessing facility services. On the other hand, a weak referral system, unreliable communication between facilities, and complaints by facility staff about unavailability of preferred drugs and inadequacy of certain drugs and other products in the caesarean kits continue to undermine service provision. Addressing these barriers can bring Mali strides closer to achieving desired outcomes in maternal health.

It is worth noting a few limitations of the analysis presented in this report. The absence of a controlled study makes it difficult to fully attribute the changes observed to the free policy. Other existing factors may have contributed to those changes. For example, the increase in caesarean sections observed since the establishment of the policy may be partly the result of better monitoring and capture of data related to caesareans. At the same time, the increase in assisted deliveries may be due to multiple efforts by the Malian government and its technical and financial partners over the last years to increase reproductive health awareness in the community. Irrespective of the limitations of this study, the findings remain worthy for consideration among policymakers in Mali.

Based on the findings detailed in this report, we list a number of policy options that may be warranted:

- **Strengthen the functioning of the referral and emergency transport system** by raising awareness among communities and local actors of their responsibility to contribute to the solidarity funds for transportation, and strengthen the committees that are responsible for ensuring that contributions to the solidarity funds are made on time.

- **Establish an appropriate transport system between the villages and the CCom.** This will shift significant transport costs away from households, especially the poor, who seem to be carrying most of the burden, and allow the provision of reliable and affordable transportation services in remote and isolated areas.
- **Set up reliable communication networks between facilities** by supplying workable telephones and a functioning RAC at all levels of facilities. Functioning communication devices must remain part of the facilities' basic equipment. This will ensure proper and timely communication between facilities and providers in case of emergency transport.
- **Revisit the content of the caesarean kits** to examine the adequacy and availability of drugs needed for the caesarean cases at hand. In addition, ensure that the kits are distributed to facilities on time to prevent facilities from having to tap into their own resources to close the gaps. This will prevent bankruptcies of the DRC and facility-based pharmacies.
- **Establish sufficient numbers of blood banks and set up an effective policy for blood collection.** This is an urgent need considering that many women in labor are dying because of the lack of emergency transfusions. It is also important to sensitize community members to donate blood.
- **Reinforce the integration of maternal health messages into other services provided at the facility.** Encourage facility staff (through training, mentoring, or performance-based incentives) to deliver important maternal health-related messages to patients, especially during immunization or child health visits in facilities, mobile clinics, or during outreach visits. The messages should emphasize the risks of complications from pregnancies and the need for careful monitoring of the health of the mother and the baby.
- **Increase awareness among communities** of the specific elements of the policy, what is covered by the policy and what is not, the roles and responsibilities of various actors, and the importance of delivering in health facilities. This could be done with the leadership of local officials and using techniques such as door-to-door sensitization visits, distribution of leaflets in facilities and in public places, or behavior change health campaigns through the mass media. These should raise awareness of the importance and affordability of life-saving procedures such as caesareans, and encourage families and women to seek antenatal and delivery care at health facilities.
- **Develop a long-term strategy to address the sustainability of the policy and remove remaining access barriers to essential obstetric care in Mali (normal deliveries, caesareans, etc...).** Several stakeholders expressed concern about the financial sustainability of the fee exemption policy. Careful planning is needed to improve the likelihood that the government can continue to prioritize subsidies for surgical obstetric care, especially as population uptake continues to increase. Ultimately, to ensure that women have access to all essential safe motherhood services and to achieve MDG 5, the financial and nonfinancial barriers that still impede utilization of facility-based obstetric care— especially among the poorest women – will need to be addressed as well.

ANNEX A: DATA COLLECTION SUPERVISORS

Region	Individuals responsible for overseeing the SES data collection
Kayes	Dr. Hachimi Mohamadou, Dr. Moussa Yattara, Mr. Sidy Boubacar Ag Ikou, Mr. Sidaly Coulibaly, Ms. Bah Assa Diakité, Mr Bounama Sissoko, Mr. Abdoulaye Sylla, Dr. Yacouba Sangaré, Mr. Moussa Dembélé, Mr. Bakary Maiga, Ms. Dembélé Koniba Dembélé, Ms. Fatoumata Dabo, Ms. Barkatou Touré, Ms. Labouda Mariko et Mr. Mamadou Sidibé.
Koulikoro	Dr. Seydou Guindo, Mr. Daouda Dicko, Ms. Sanogo Bintou Koné, Dr. Hanna k Coulibaly, Dr. Hamidou Coulibaly, Dr. Sidiki Niaré, Mr. Bakary Keita, Dr. Drissa Coulibaly, Dr. Amadou A Tangara, Dr. Yaya Diakité, Dr. Mahamadou Diakité, Mr. Djimé Tamboura, Mr. Modibo Traoré, and Ms. Cissé Nankoria Keita.
Sikasso	Dr. Bakary Kampo, Dr. Soudjougou Témé, Mr. Ténémake Keita, Ms. Berthé Djeneba Dembélé, Mr. Djime Tamboura, Ms. Marietou Dembélé, Mr. Klabé Barré, Mr. Ousseni Bagayoko, Mr. Siratigui K. Diallo, Dr. Noumou Mallé, Mr. Elie Guindo, Dr. Lamine Bagayoko, and Dr. Oumar Zanga Dagnon.
Segou	Dr. Alassane Balobo Dicko, Dr. Bréhima Coulibaly, Mr. Hadji N'Diaye, Dr. Moulaye L Mariko, Mr. Sidi Modibo Traoré, Mr. Seckou Traoré, Mr. Boubacar Diallo, Mr. Oumar Sogodogo, Ms. Aminata Koné, Dr. Donigolo Brahim and Mr. Coulibaly Gaboukoro.
Mopti	Dr. Karim Sangaré, Dr. Mama Coumaré, Dr. Moussa Kamissoko, M. Sidiki Traoré, Mr. Siaka Sanogo, Ms. Togo Fatoumata Tolo, Dr. Bréhima Diarra, Mr. Aldiouma Maiga, Ms. Fatoumata Traoré, Ms. Nana Coulibaly, Dr. Souleymane Diarra, Ms. Kadidia Tamboura, Mr. Youssouf Haidara, Ousmane Maiga, and Amadou Coulibaly.
Tombouctou	Dr. Boureima Pléa, Ms. Sirantou Wagué, Dr. Magara Doumbia, Mr. Zouhairou Cissé, Mr. Seydou Bassaloum, Dr. Yacouba Ouattara, Ms. Djénébou Fomba, Mr. Magali Ag Telfi, Dr. Youssouf Koné, Mr. Elhadj Ossed, Mr. Soumaila Sago, Dr. Abdramane Togo, and Dr. Soumaila Maiga.
Gao	Dr. Kaoudo Tangara, Dr. Siliman Traoré, Ms. Halimatou Touré, Mr. Alassane Sanogo, Ms. Nafissa Hamadou, Dr. Alassane Traoré, Dr. Salimata Samaké, Mr. Ismail Dicko, Mr. Sidiki Souleymane, Dr. Etienne Togo, Dr. Aly Tembely, Mr. Saloum Albad, Mr. Sagadatou Ibrahim, Ms. Mayata Nouhoum, Ms. Maiga Fadi Maiga, Mr. Abdourazak Soumana, and Mr. Matiere Kamaté.
Kidal	Dr. Cheick Tounkara, Dr. Yacouba Sangaré, Mr. Cheikna Diallo, Dr. Bougou Goïta, and Mr. Salif Sidibé.
Bamako	Dr. Diallo Fanta Siby, Dr. Dingding Diallo, Ms. Singaré Fatoumata Touré, Dr. Niani Mounkoro, Mr. Sory Kane, Ms. Coulibaly Assitan Dembélé, Mr. Aboudou Camara, Mr. Dipa Touré, Dr. Soumana Oumar Traoré, Mr. Mahamadou Amir Maiga, Ms. Kabine Camara, Mr. Seydou Coulmibaly, Dr. Issa Togo, and Dr. Lamine Traoré.

ANNEX B: DEVELOPING A WEALTH INDEX

A key objective of this research is to identify the effects of the fee exemptions on use of delivery and caesarean services by women of low socioeconomic status (SES). We collected data on a series of wealth indicators from women delivering or having caesareans in selected health facilities across all eight regions and Bamako District in Mali. We then used these indicators to create a proxy wealth index and categorize women according to tertiles of the wealth distribution (low, medium, and high SES). The purpose of this note is to explain the methods used to:

- a. Identify 4-6 indicators (from the larger set of Demographic and Health Survey [DHS] indicators) that can serve to create the proxy wealth index;
- b. Identify weights to combine these 4-6 indicators into one composite wealth index;
- c. Justify the validity of the proxy index as a means to identify the poorest tertile of the population (the low SES group).

We used the Mali DHS 2006 dataset, a nationally representative sample survey that collected data from all eight regions in the country and Bamako District. The dataset contains information on 14,383 women of reproductive age (15-54) as identified in the households selected in the sample. The dataset also contains a variable 'wealth index' that identifies the wealth quintile, ranging from poorest to richest. The assignment to these quintiles is done based on percentile cutoff points calculated using the underlying 'DHS wealth index' value for the individuals. The latter is constructed using principal component analysis (PCA) (Rutstein et al. 2004).

Selection of candidate indicators from DHS data

The creation of a proxy wealth index suitable for use in short surveys based on DHS data has precedent in the literature (Pitchforth et al. 2007). The first step in the methodology is to pre-select some 'candidate' indicators for review. The intentions of the review are to isolate indicators that show variation across the DHS wealth index quintiles. Indicators that were reviewed included those considered by Pitchforth et al. plus some others (Table B1).

TABLE B1: KEY SES INDICATORS REVIEWED FROM THE MALI DHS 2006

Educational attainment	Has bicycle
Has electricity	Has television
Main floor material	Source of drinking water
Literacy	Has car/truck*
Education in single years*	Ethnicity*
Has telephone	No. of children ≤ 5 *
Has radio	Type of cooking fuel*
Type of toilet facility	

* Indicators not reviewed by Pitchforth et al.

From the indicators reviewed in Table B1, we selected five that showed sufficient variation across the quintiles of the DHS wealth index. While two are asset wealth-related binaries, the other three are categorical variables related to living circumstances. They are shown in Table B2.

TABLE B2: UNWEIGHTED AND WEIGHTED SCORES FOR SELECTED WEALTH INDICATORS

Variable and response groupings	Crude Score*	Rescaled Score*	Weight	Weighted poverty score*
Main floor material				
Dirt/Sand	1	0	3	0
Dung	2	0.17		0.5
Parquet or polished wood	4	0.5		1.5
Vinyl or linoleum/asphalt				
Tiles	3	0.33		1.0
Cement	7	1.0		3
Carpet	6	0.8		2.5
Other	5	0.67		2.0
Has bicycle				
No	1.5	0.66	Weights vary (see Table B3)	Various
Yes	1	0		Various
Source of drinking water				
Piped into dwelling	9	0.9	2	1.8
Piped to yard/plot	8	0.8		1.6
Public tap/standpipe	10	1		2
Protected well	5	0.4		0.9
Unprotected well	1	0		0
Protected spring	4	0.3		1
River/dam/lake/ponds/	3	0.2		0.4
Rainwater	2	0.1		0.2
Bottled water	7	0.7		1
Other	6	0.6		1.1
Has television				
No	1	0	5	0
Yes	2	1		5
Type of cooking fuel				
Electricity	5	1	1	1
LPG	5	1		1
Charcoal	4	0.75		0.75
Wood	1	0		0
Animal dung	2	0.25		0.25
Other	3	0.5		0.5

* A higher value on these scores is correlated with higher wealth (or general SES)

Creating a proxy wealth index

Following a similar procedure as in Pitchforth et al. (2007), we gave the responses on the selected indicators a crude score based on our analysis of the pattern of variation across quintiles of the DHS wealth index. The crude scores are shown in Table B2. We rescaled these crude scores to vary between 0 and 1, and then we assigned certain weights to each of the indicators based on the strength of variation. If the indicator varied smoothly across the DHS wealth quintiles, we assigned it a higher weight. Indicators with some skew merited a lower weight (McKenzie 2003). While most of the

indicators showed similar variance patterns across the wealth quintiles in each region and hence were given a single weight, the indicator ‘has bicycle’ had a definite pattern of variation in only one group of regions. In the other group of regions the pattern ran in the counterintuitive direction or there was insufficient variation across the DHS wealth quintiles. We assigned a higher weight to regions with a strong pattern of variation higher (Table B3) and a lower weight to those exhibiting a weaker pattern (Bamako). Regions showing little variation were weighted lowest.

TABLE B3: WEIGHTS FOR THE ‘HAS BICYCLE’ INDICATOR BY REGION

Kayes	1
Koulikoro	4
Sikasso	4
Segou	4
Mopti	1
Tombouctou	1
Gao	1
Kidal	1
Bamako	2

Defining SES groups and validating the index

We used the proxy wealth index to classify women into tertiles of the wealth distribution. We defined the first tertile as the low SES group, the second tertile as the mid SES group, and the third tertile as the high SES group. Similarly, we created tertiles using the DHS wealth index for comparison purposes. We performed kappa analysis¹¹ to measure the degree of agreement between the various ratings, in order to validate our proxy index. Table B4 shows the results of the kappa analysis. Based on Landis and Koch (1977), the proxy wealth index and the DHS Wealth Index have ‘moderate’ agreement since the kappa statistics falls between 0.41 and 0.6.

In addition, we created an index using the PCA methodology on our five selected indicators in the larger DHS dataset (PCA index). The use of PCA for creating a general indicator of SES has been reviewed in other studies (Vyas and Kumaranayake 2006; Filmer and Pritchett 2001). We created tertiles based on the PCA index and performed Kappa analysis (Table B4). With a Kappa statistic of 0.61, our proxy wealth index and the PCA index show ‘substantial’ agreement.

TABLE B4: RESULTS OF KAPPA ANALYSIS

Comparison on tertile ratings	Agreement	Expected Agreement	Kappa statistic
Proxy wealth index vs. DHS wealth index	65.3%	33.4%	0.48
Proxy wealth index vs. PCA index	73.6%	33.5%	0.61

¹¹ Kappa analysis is a statistical technique used to measure agreement among raters. It gives a score of how much homogeneity, or consensus, there is in the ratings given by categorical indicators. It is generally thought to be a more robust measure than simple percent agreement calculation because it takes into account the agreement occurring by chance.

The results of the Kappa analysis validate the use of our proxy index and the use of wealth tertiles for classifying women into SES groups. We note the cutoff values of the proxy index at each tertile and use these same values to classify women who delivered or had caesarean sections in our SES survey into low, medium, and high SES groups.

ANNEX C: LIST OF FACILITIES IN SAMPLE

Region	Selected facility
Kayes (S)	Hôpital Kayes
Kayes (S)	Diéma- CSRef
Kayes (S)	Nioro- CSRef
Kayes (S)	Guomitra- CSCoM (CSRef - Diéma)
Kayes (S)	Dianveily Counda- CSCoM (CSRef - Nioro)
Koulikoro (S)	CSREF Koulikoro*
Koulikoro (S)	Kangaba- CSRef
Koulikoro (S)	Banamba- CSRef
Koulikoro (S)	Narena- CSCoM (CSRef -Kangaba)
Koulikoro (S)	Toukoroba- CSCoM (CSRef -Banamba)
Sikasso (C)	Hôpital Sikasso
Sikasso (C)	Yan folila- CSRef
Sikasso (C)	Kolondiéba- CSRef
Sikasso (C)	Fakola- CSCoM (CSRef - Kolondiéba)
Sikasso (C)	Niessoumala- CSCoM (CSRef - Yan folila)
Ségou (C)	HNF- Hôpital
Ségou (C)	Bla- CSRef
Ségou (C)	San- CSRef
Ségou (C)	Penesso- CSCoM (CSRef - Bla)
Ségou (C)	Dieli- CSCoM (CSRef - San)
Mopti (C)	Hôpital Mopti
Mopti (C)	Douentza- CSRef
Mopti (C)	Tenenkou- CSRef
Mopti (C)	Boni- CSCoM (CSRef - Douentza)
Mopti (C)	Diguicire- CSCoM (CSRef - Tenenkou)
Tombouctou (N)	Tombouctou- Hôpital
Tombouctou (N)	Goundam- CSRef
Tombouctou (N)	Niafunké- CSRef
Tombouctou (N)	Tin Aicha- CSCoM (CSRef - Goundam)
Tombouctou (N)	Gounambougou- CSCoM (CSRef - Niafunké)
Gao (N)	H Gao- Hôpital
Gao (N)	Ansongo- CSRef
Gao (N)	Bourem- CSRef
Gao (N)	Bara- CSCoM (CSRef - Ansongo)

Region	Selected facility
Gao (N)	Kermachoe- CSCom (CSRef - Bourem)
Kidal (N)	Kidal- CSRef *
Bamako	Gabriel Toure- Hôpital tertiare
Bamako	Commune V- CSRef
Bamako	Commune II- CSRef
Bamako	Benkady- CSCom (CSRef - Commune V)
Bamako	Asacotoqa- CSCom (CSRef - Commune II)

*Acting as regional hospitals.

S=South C=Center N=North

ANNEX D: ADDITIONAL RESULTS

**TABLE D1: TRENDS IN CAESAREAN RATES BY REGION AND HEALTH DISTRICT 2005-2009
(AS A PERCENTAGE OF TOTAL EXPECTED DELIVERIES)**

Regional Hospitals and Health Districts (Cercles) by region	2005	2006	2007	2008	2009
KAYES REGION	<i>0.45</i>	<i>1.36</i>	<i>1.32</i>	<i>1.47</i>	<i>1.57</i>
Hôpital Kayes	1.04	2.92	2.44	2.39	2.31
Bafoulabé	0.13	0.92	0.85	0.96	1.25
Diéma	0.27	0.75	0.78	0.95	1.03
Kéniéba	0.10	0.53	0.95	0.66	1.12
Kita	0.39	1.07	1.02	1.63	2.07
Nioro	0.23	1.04	1.19	1.41	1.04
Yélimané	0.39	0.56	0.90	0.99	0.65
KOULIKORO REGION	<i>0.34</i>	<i>0.88</i>	<i>0.91</i>	<i>0.92</i>	<i>1.23</i>
Koulikoro	1.53	3.05	3.18	3.65	2.72
Banamba	0.16	0.47	0.75	0.87	0.88
Diola	0.60	1.45	1.37	1.38	2.76
Fana	0.15	0.57	0.60	1.16	1.38
Kangaba	0.62	1.52	0.87	1.32	0.65
Kolokani	0.40	1.29	1.67	0.98	0.55
Nara	0.28	0.64	0.88	0.55	0.64
Ouelessebg	0.16	1.08	0.57	0.58	1.49
Garnison Kati	0.00	0.00	0.00	0.00	0.00
SIKASSO REGION	<i>0.54</i>	<i>1.45</i>	<i>1.67</i>	<i>1.75</i>	<i>1.94</i>
Hôpital-Sikasso	0.46	1.53	1.92	1.85	3.09
Bougouni	0.48	1.38	1.27	1.50	0.77
Yanfolila	0.30	1.19	1.11	1.73	1.70
Kolondiéba	0.41	0.98	1.76	1.29	2.38
Kadiolo	0.75	2.28	3.14	3.32	1.37
Koutiala	0.73	1.49	1.13	1.57	4.68
Yorosso	0.61	1.07	1.45	1.07	0.91
Sélingué	0.50	1.61	2.82	2.62	2.98
SEGOU REGION	<i>0.65</i>	<i>1.59</i>	<i>1.87</i>	<i>1.93</i>	<i>2.01</i>
Hopital-Ségou	0.74	1.69	1.98	2.00	2.98
Baraouéli	0.52	1.68	1.39	1.64	0.99
Bla	0.66	1.43	1.79	1.72	2.81
Macina	0.43	1.84	1.78	1.77	1.19
Markala	0.53	1.45	1.46	1.89	2.30
Niono	1.26	2.35	3.19	3.23	5.07
San	0.27	1.05	1.51	1.47	1.85
Tominian	0.61	1.06	1.21	1.30	0.63
MOPTI REGION	<i>0.36</i>	<i>0.93</i>	<i>1.06</i>	<i>1.20</i>	<i>1.14</i>
Hôpital-Mopti	0.95	2.47	2.97	3.01	1.99
Bandiagara	0.30	0.62	0.84	1.03	1.32

Regional Hospitals and Health Districts (Cercles) by region	2005	2006	2007	2008	2009
Bankass	0.14	0.64	0.53	0.54	0.42
Djenné	0.29	0.71	0.81	1.08	0.76
Douentza	0.27	0.46	0.74	0.91	0.94
Koro	0.22	0.60	0.50	0.62	1.67
Tenenkou	0.33	0.72	0.75	1.15	1.05
Youwarou	0.16	0.68	0.93	1.17	0.51
TOMBOUCTOU REGION	0.21	0.77	0.97	0.85	1.02
Hôpital-Tombouctou	0.38	1.52	1.33	0.75	0.29
Diré	0.20	0.86	1.29	0.38	0.00
Goundam	0.00	0.13	0.25	0.36	0.54
Gourma Rharous	0.03	0.05	0.32	0.57	0.17
Niafunké	0.24	0.62	0.67	0.68	2.46
GAO REGION	0.50	1.14	1.67	1.37	1.64
Hôpital-Gao	1.00	2.08	3.20	2.85	6.03
Ansongo	0.16	0.71	0.94	0.43	0.61
Bourem	0.14	0.28	0.23	0.37	0.90
Ménaka	0.08	0.31	0.41	0.00	0.29
KIDAL REGION	0.28	0.51	0.65	0.53	0.62
Kidal	0.28	0.51	0.65	0.53	0.62
Abéïbara	0.00	0.00	0.00	0.00	0.00
Tin Essako	0.00	0.00	0.00	0.00	0.00
Tessalit	0.00	0.00	0.00	0.00	0.00
BAMAKO REGION	2.72	6.40	6.89	7.11	7.25
Commune I	1.67	4.51	4.40	4.57	5.10
Commune II	0.00	0.00	5.84	5.29	5.84
Commune III	0.00	0.00	0.00	0.00	0.00
Commune IV	3.13	5.26	5.28	6.47	8.12
Commune V	6.52	10.03	10.72	10.59	11.33
Commune VI	0.93	2.19	2.29	2.69	2.74

Source: HMIS data, 2005-2009

TABLE D2: TRENDS IN INSTITUTIONAL DELIVERY RATES BY REGION AND HEALTH DISTRICT 2005-2009 (AS A PERCENTAGE OF TOTAL EXPECTED DELIVERIES)

Regional Hospitals and Health Districts (Cercles) by region	2005	2006	2007	2008	2009
KAYES	40	42	50	57	58
Hôpital Kayes	58	60	72	75	79
Bafoulabé	35	35	40	56	50
Diéma	35	51	53	58	63
Kéniéba	15	22	26	20	23
Kita	30	29	38	53	53
Nioro	32	43	52	52	54
Yélimané	67	47	56	66	67
KOULIKORO	53	58	61	64	67
Koulikoro	52	51	59	63	73
Banamba	45	43	49	54	49
Diola	65	67	63	59	64

Regional Hospitals and Health Districts (Cercles) by region	2005	2006	2007	2008	2009
Fana	58	56	65	63	64
Kangaba	50	55	67	72	88
Kolokani	58	65	61	60	75
Nara	21	23	26	37	41
Ouelessebg	61	79	88	78	82
Garnison Kati	56	66	66	74	70
SIKASSO	64	59	63	66	71
Hôpital-Sikasso	71	62	58	52	64
Bougouni	68	52	65	70	66
Yanfolila	45	45	61	84	80
Kolondiéba	50	56	49	50	49
Kadiolo	72	76	78	97	103
Koutiala	66	64	79	80	82
Yorosso	57	57	45	59	67
Sélingué	45	48	60	50	59
SEGOU	50	55	60	61	63
Hopital-Ségou	46	42	52	53	53
Baraouéli	40	60	62	69	74
Bla	59	62	64	62	59
Macina	41	52	65	59	58
Markala	46	47	51	54	65
Niono	68	55	62	63	62
San	52	70	67	71	74
Tominian	41	57	57	57	63
MOPTI	34	40	37	42	44
Hôpital-Mopti	52	50	54	55	57
Bandiagara	34	38	20	19	22
Bankass	17	34	44	51	42
Djenné	36	33	26	35	34
Douentza	25	28	23	28	33
Koro	47	60	52	58	72
Tenenkou	22	33	35	42	43
Youwarou	16	14	16	27	27
TOMBOUCTOU	24	27	35	31	33
Hôpital-Tombouctou	49	51	52	52	55
Diré	22	27	30	33	33
Goundam	15	14	30	27	19
Gourma Rharous	29	40	42	23	17
Niafunké	19	21	29	39	44
GAO	20	22	22	22	24
Hôpital-Gao	27	29	28	31	26
Ansongo	12	15	17	13	23
Bourem	22	24	23	27	35
Ménaka	13	9	9	6	12
KIDAL	18	24	16	35	29
Kidal	38	31	18	46	42
Abéïbara	2	34	36	51	16
Tin Essako	1	30	4	35	80

Regional Hospitals and Health Districts (Cercles) by region	2005	2006	2007	2008	2009
Tessalit	8	6	5	11	7
BAMA KO	97	99	94	96	97
Commune I	106	105	106	117	119
Commune II	80	89	98	96	105
Commune III	82	95	93	96	98
Commune IV	114	104	93	111	113
Commune V	129	134	146	123	118
Commune VI	72	76	56	62	67

Source: HMIS data, 2005-2009

ANNEX E: BIBLIOGRAPHY

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