

Health, Nutrition, and Population in Madagascar 2000–09

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Contents

Acknowledgments	ix
Acronyms and Abbreviations	x
Executive Summary	xiii
1. Introduction and Context	1
Country and Sector Context.....	1
Objectives and Organization of the Country Status Report.....	2
Available Data and Reports	3
2. Sector Outcomes and Demographic Trends	5
Demographic Trends	5
Child Health.....	7
Maternal Health.....	12
Nutritional Status of Children and Women	14
Other Communicable Diseases Contributing to Mortality and Morbidity in Madagascar.....	16
Non-Communicable Diseases.....	19
Meeting the Millennium Development Goals (MDGs)	20
3. Behaviors Conducive to Better Health Outcomes	25
Behaviors and Interventions Affecting Child Health.....	25
Community Factors and Behaviors Affecting Nutritional Status of Children.....	29
Maternal Health and Reproductive Health	36
Communicable Diseases.....	43
Health Care Access and Utilization by the Poor.....	48
4. Health System Performance	56
Sector Organization.....	56
Quality of Services.....	66
5. Sector Financing	78
Financing of the Health Sector	78
Equity of Health Spending.....	90
Efficiency Issues of Health Spending	100
Scope for Creating Fiscal Space.....	104
Potential Impact of the Crisis on the Health Sector	105
6. Strengthening Accountability in the Health Sector	110
The Importance of Accountability for Health	110
Governance and Accountability in the Malagasy Context.....	111

Appendixes.....	131
Appendix 1. Indicators and Outcomes.....	133
Appendix 2. Child Nutrition and Early Childhood Development	135
Appendix 3. Health Financing.....	138
Appendix 4. Best Practices in RBF from around the World.....	142
Appendix 5. Summary of CSC Ratings in Anosy during implementation and follow-up.....	143
References.....	145

Boxes

Box 2.1. Maternal mortality in Madagascar	13
Box 3.1. Maternal knowledge and self-efficacy.....	32
Box 3.2. Creation of a National Community Nutrition Program.....	34
Box 3.3. Pilot to cover the direct and indirect costs related to emergency obstetrical and neonatal care in the regions of Boeny and DIANA	42
Box 3.4. Distance to the nearest health center: the case of a village in Majunga region.....	50
Box 3.5. Santé Sud program.....	51
Box 4.1. Quality of infrastructure affecting maternal and neonatal health	68
Box 4.2. Response of the public to suspension of user fees (2001-2004).....	71
Box 5.1. A brief presentation of Madagascar's budget execution process.....	85
Box 5.2. Some key elements of the equity funds at the health center level	94
Box 5.3. Some key elements of the equity funds at the district hospital level.....	96
Box 5.4. Community Insurance Scheme (Mutuelle) of Ankazomanga-Ouest.....	98
Box 5.5. Two examples of pilot community-based health insurance schemes in the regions of Haute Matsiatra and Atsinanana	99
Box 5.6. Selected country experiences with decentralization	103
Box 6.1. Accountability of FANOME and drugs for the poor	115
Box 6.2. Increasing utilization of basic maternal and child health interventions through RBF	122
Box 6.3. Community Score Cards process.....	124

Figures

Figure 1.1. Determinants of health sector outcomes.....	3
Figure 2.1. Madagascar's population composition in 2005.....	5
Figure 2.2. Projections for TFR, population growth rate and number of children under five.....	7
Figure 2.3. Under-five mortality rate: gaps between and within countries.....	7
Figure 2.4. Under-five mortality rates differentials by economic quintile.....	8
Figure 2.5. Under-five mortality rate differentials by residence	8
Figure 2.6. Principal causes of in-patient mortality at the hospital level for children under five in 2007 (number of deaths).....	11
Figure 2.7. Maternal mortality ratio (per 100,000 live births) in 2008	12

Figure 2.8. Anemia prevalence trends among children under five.....	15
Figure 2.9. Anemia prevalence trends among women 15–49 years old.....	16
Figure 2.10. Burden of disease mortality (percentage of all-cause mortality – on the left, percentage of all infectious and parasitic disease mortality – on the right).....	16
Figure 2.11. TB incidence, prevalence, and mortality, all forms with and without HIV+ (per 100,000 population per year)	18
Figure 2.12. Incidence and DOTS diagnosis of TB in Madagascar and Sub-Saharan Africa	18
Figure 2.13. Progress towards achieving MDG 4, Madagascar and Sub-Saharan Africa.....	21
Figure 3.1. Levels of vaccination coverage in Madagascar, 2008	26
Figure 3.2. ORS/ORT knowledge and utilization across economic strata (quintiles)	28
Figure 3.3. Hypothesized relation between poverty, stunting, child development, and school achievement	30
Figure 3.4. Maternal knowledge about child health and child development	33
Figure 3.5. Association between maternal knowledge and self-efficacy and maternal education.....	33
Figure 3.6. Modern contraceptive prevalence rate (percentage of married women).....	37
Figure 3.7. Prevalence of teenage mothers across social-demographic strata (percentage of adolescents aged 15–19 who are pregnant or already have a baby).....	39
Figure 3.8. Assistance at delivery (percentage of women who had medically trained assistance at birth, and percentage of women who delivered in a health center).....	41
Figure 3.9. Malaria transmission epidemiological zones	44
Figure 3.10. Immunization rate and poverty headcount by district and region (2003 and 2006 respectively)	48
Figure 3.11. Immunization rates by household assets quintiles	49
Figure 3.12. Reasons for not seeking health care when ill	49
Figure 4.1. Public and private health care delivery network.....	57
Figure 4.2. Hospital beds density (per 10,000 population)	58
Figure 4.3. Functioning of the drug supply chain.....	59
Figure 4.4. Physicians density (per 10,000 population).....	60
Figure 4.5. Nursing and midwifery personnel density (per 10,000 population)	61
Figure 4.6. Ratio of nurses and midwives to physicians	61
Figure 4.7. Community and traditional health workers density (per 10,000 population)	61
Figure 4.8. Ratio of health management and support workers to health service providers.....	62
Figure 4.9. Outflow of health workers, 1993–2002.....	63
Figure 4.10. Ratio of prescriptions filled to prescriptions written in the public sector, and number of new prescriptions at the health center (millions)	69
Figure 4.11. Number of prescriptions written (millions) and ratio of prescriptions filled to prescriptions written (1999–2008).....	69

Figure B4.2.1. Impact of crisis and fee suspension on outpatient visits per capita, 2001-2004 (smoothed data and smoothed monthly pattern)	71
Figure B4.2.2. Impact of the crisis and fee suspension on prescriptions filled in the public sector, 2001-2004 (proportion of prescriptions filled smoothed data, and smoothed monthly pattern)	72
Figure 4.12. Ability to correctly diagnose/prescribe treatment for various illnesses (percentage of centers in which all patients examined during the supervisory visit were correctly diagnosed/treated).....	73
Figure 4.13. Income inequalities in quality of antenatal care	74
Figure 5.1. Distribution of private sources of financing	79
Figure 5.2. Composition of MoH's budget and expenditures by economic category 2005-2008 (in percent).....	81
Figure 5.3. Distribution of resources to the Ministry's core programs 2008 (in percent).....	82
Figure 5.4. Total MoH Budgetary Allocation, Expenditure and Execution Rate (percent) 2004-2008 (in billions of Ariary and in percent)	83
Figure 5.5. Comparison of MFB and MoH execution rates.....	84
Figure 5.6. Roles and responsibilities in project and budget management.....	87
Figure 5.7. Distribution of the MoH's budget by administrative level in 2007 and 2008	91
Figure 5.8. Share of health spending in total spending per capita, by income quintile (in percent).....	92
Figure 5.9. Drug availability, income and expenditure (health center level).....	102
Figures A3.1a and A3.1b.: Regional distribution of non-salary recurrent expenditures per capita and distribution of health personnel under the ministry payroll	141

Tables

Table 2.1. Demographic trends (infant mortality rate, under-five mortality rate, TFR, modern CPR)	6
Table 2.2. Results from a Cox Proportional Model on child mortality (hazard ratio)	10
Table 2.3. Trends in malnutrition rates for children under five, 1997-2009	14
Table 3.1. SEECALINE availability and maternal knowledge and self-efficacy	35
Table 3.2. Child care practices in SEECALINE and non-SEECALINE survey sites (percentage of total number of mothers or children).....	35
Table 3.3. Prevalence of at-risk sexual behaviors of youth (2006 and 2008 data)	39
Table 3.4. Malaria indicators 2004-2008	45
Table 3.5. Changes in indicators of HIV knowledge and behavior among most at risk groups (2004, 2006, and preliminary results from 2008).....	46
Table 3.6. Tuberculosis treatment, pilot program indicators	47
Table 4.1. Number of medical facilities in 2007, by type and by sector.....	57
Table 4.2. Total numbers and densities of health workforce in 2002.....	60
Table 4.3. Estimates of annual losses due to mortality under age 60 among health workers in selected countries of the WHO Africa Region, based on life table analysis.....	63

Table 4.4. Infrastructure quality of health centers in 2005 (percent of surveyed centers)	67
Table 4.5. Health care personnel to patient ratio in 2005	67
Table 4.6. Availability of selected drugs (in percentage) as reported in November 2006 and in May 2007.....	70
Table 4.7. Number of health centers that complied with existent protocol for ANC visits.....	75
Table 4.8. Supervisory visit frequency and quality for public and private health centers (percentage of total health centers that responded).....	76
Table 5.1. Evolution of MoH’s budget and actual spending 2004-2009	80
Table 5.2. Growth of MoH’s budget by economic category 2005–2008 (in percent)	81
Table 5.3. MoH’s budget execution rate by economic classification, 2008.....	89
Table 5.4. Comparison of health expenditures per capita and the mortality rate in a number of selected Sub-Saharan African countries in 2006.....	100
Table 5.5. Distribution of MoH’s resources according to health functions.....	101
Table 6.1. Accountability categories, activities, and purposes.....	111
Table 6.2. Proportion of CSBs supervised.....	117
Table 6.3. Proportion of health workers absent at the time of the surveys, 2006/2007	119
Table 6.4. Reasons for absenteeism, 2006/2007 (as stated by health center director, in percent).....	120
Table A1.1. Population dynamics	133
Table A1.2. Population projections (000s).....	134
Table A2.1. Socio-economic correlates of nutritional outcomes	136
Table A2.2. District level changes on nutritional outcomes (1997-2004): fixed effect regressions	137
Table A3.1. Comparison in health expenditure indicators between Madagascar and other Sub-Saharan countries	138
Table A3.2. Comparison of the Budget allocation by ministries 2008-2009.....	138
Table A3.3. Budget execution rate of selected sector ministries 2008 (End of June 2009).....	139
Table A3.4. MoH’s budget by economic category 2005-2008 (in billions Ariary).....	139
Table A3.5. Summary of ongoing health projects funded by the development partners in 2008.....	139
Table A3.6. Distribution of the MoH budget by administrative level 2007 and 2008 ...	140
Table A3.7. Comparison between actual health budget and projections of the MTEF.....	140

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Acronyms and Abbreviations

ACT	Artemisinin-based Combination Therapy
AFD	<i>Agence Française de Développement</i>
AfDB	African Development Bank
AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ARI	Acute Respiratory Infections
AWP	Annual Work Program
BCG	Vaccine against tuberculosis
BEmONC	Basic Emergency Obstetrical and Newborn Care
CEmONC	Complete Emergency Obstetrical and Newborn Care
CHD	<i>Centre Hospitalier de District</i>
CPR	Contraceptive prevalence rate
CSB	<i>Centre de Santé de Base</i>
CSC	Community Score Card
CSR	Country Status Report
DAAF	<i>Department of Administration and Finance</i>
DDDS	<i>Direction de Développement des Districts Sanitaires</i>
DEP	Department of Planning
DHS	Demographic and Health Survey
DPT	Diphtheria, Pertussis, and Tetanus
DSSB	<i>Direction des Soins de Santé de Base</i>
EA	Anthropometric Survey
ECD	Early Childhood Development
EEEFs	Equity and Efficiency Study of Health Facilities
EmONC	Emergency Obstetrical and Newborn Care
EPM	<i>Enquête Périodique auprès des Ménages</i>
ESB	<i>Enquête de Surveillance Biologique</i>
ESC	<i>Enquête de Surveillance Comportementale</i>
EU	European Union
FANOME	<i>Fonds d'Approvisionnement Non-stop des Médicaments</i>
GDP	Gross domestic product
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)
HIV	Human Immunodeficiency Virus
IHP+	International Health Partnership and related initiatives
IMR	Infant mortality rate
INSTAT	<i>Institut National de la Statistique</i>
IPTp	Intermittent preventive treatment of pregnant women
JHSSP	Joint Health Sector Support Project
KfW	Kredit Anstalt für Wiederaufbau
MAP	Madagascar Action Plan
MBB	Marginal Budgeting for Bottlenecks

MDG	Millennium Development Goals
MFB	Ministry of Finance and Budget
MoH	Ministry of Health and Family Planning
MTEF	Medium Term Expenditure Framework
NGO	Nongovernmental organization
NHA	National Health Accounts
ORDSEC	Ordonnateur secondaire
ORS/ORT	Oral Rehydration Salts/Treatment
OSTIE	Enterprise-funded health facility
PAIS	Integrated supply chain and logistic plan for the procurement and distribution of essential health commodities
PDSSPS	Plan de Développement du Secteur Santé et de la Protection Sociale
PETS	Public Expenditure Tracking Survey
PFU	Participation Financière des Usagers
PSI	Population Services International
PSIA	Poverty and Social Impact Analysis
RBF	Results based financing
SALAMA	National Drug Procurement Agency
SEECALINE	Community-based Nutrition Program
SHSDP	Sustainable Health System Development Project
SIGFP	<i>Système Intégré de Gestion des Finances Publiques</i>
STI	Sexually transmitted infections
SSA	Sub-Saharan Africa
TB	Tuberculosis
TFR	Total fertility rate
UNFPA	United Nations Fund for Population Activities
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
WHO	World Health Organization

Executive Summary

Introduction and Context

With an income per capita below US\$400 in 2008, Madagascar is one of the poorest countries in the world. Poverty is widespread but with significant urban-rural differences (52 percent versus 74 percent). Health, nutrition, and the fight against communicable diseases and HIV/AIDS are key goals of the country's poverty reduction strategy, the Madagascar Action Plan 2007-2012. The National Health Sector and Social Protection Development Plan 2007-2011 was developed to strengthen the health system and improve service delivery to reduce neonatal, child and maternal mortality, address malnutrition and control communicable illnesses. In January 2009, political tensions erupted and led to the military-backed extra-constitutional transfer of power and the consequent establishment of an interim de facto Government on March 17, 2009, not recognized by the international community. The macroeconomic situation remains fragile, and political instability is likely to have a negative impact on growth. However, no in-depth study has been undertaken to measure the impact of the crisis on the population; therefore, the impact on the sector and on key health indicators is as yet unknown.

The health sector has benefitted from increasing investment over the last years, and a number of studies and surveys have been carried out, providing a wealth of information that is yet to be analyzed in a complementary way. This Country Status Report (CSR) seeks to capitalize on all of the existing data in the health sector, compare Madagascar to countries of similar income levels and assess the results achieved by the health system. The CSR provides an analysis of the population's health and nutrition status by linking health outcomes, household/individual behaviors, community factors, government interventions, and service provision. In addition to Demographic and Health Surveys (DHS) for 1997, 2003/04, and 2008/09, Madagascar has benefitted from two Studies of the Efficiency and Equity of Health Facilities 2003 and 2005, national Household Surveys conducted every two years since 1997, two sets of National Health Accounts (2003 and 2007), a series of commune surveys and censuses, several nutrition surveys including three rounds of Anthropometric Surveys, and a number of Biological Surveillance Surveys and Behavior Surveillance Studies (2004, 2006, and 2008). Finally, smaller surveys were undertaken, such as the Public Expenditure Tracking Survey (PETS), Bottlenecks in the Supply Chain of Pharmaceuticals, and Absenteeism of Health Sector Workers.

Sector Outcomes and Demographic Trends

Life expectancy, estimated at 59 years in 2007, is steadily increasing in contrast to many African countries affected by the burden of HIV/AIDS. Madagascar is facing rapid population growth and the population is very young, with 44 percent under 15 years. Estimated at 19.5 million in mid-2009, the population is expected to reach 42 million by 2050. The total fertility rate (TFR), estimated at 4.8 between 2006 and 2008, has steadily declined in the past ten years. The country is in the final stage of the demographic transition and the TFR is expected to rapidly decrease. Despite a decline in fertility the number

of women of childbearing age will continue to be disproportionately high (due to current fertility rates). As a result of this population momentum phenomenon, while birth rates will fall (number of children per woman), the total number of births per year will increase and population is projected to rise until at least 2050.

Prior to the 2009 political crisis, Madagascar seemed likely to achieve the fourth Millennium Development Goal (MDG) related to child health. Under-five mortality more than halved between 1997 and 2008, declining from 163 per 1,000 live births to 72, and is better than the Sub-Saharan African (SSA) average. However, poorer children continue to have a smaller chance of reaching their fifth birthday than better-off children, although the gap was reduced dramatically between 2003 and 2008. Child mortality is higher in rural areas and small urban centers than in the capital city but improving at a faster rate in rural areas than in urban ones. There are a number of possible reasons for these large geographical and income differences in child health outcomes, including the education of the mother, access to better sanitation and clean water, and multiple births. The top two causes of in-patient mortality were perinatal circumstances, followed by diarrhea-related complications. While malaria is the fourth cause of hospital mortality for children between one and four years old, it is thought to be the top cause of child mortality in general.

Although Madagascar is performing better than the SSA average of 645 per 100,000 live births, the maternal mortality rate has stagnated over the last decade and in 2008/09 was estimated at 498. These unsatisfactory results are in part attributable to inadequate access to skilled staff at delivery, poor quality of antenatal care, lack of emergency obstetric care services, sub-standard quality of care, inadequate post-natal follow-up, lack of confidence and belief in the importance and use of health services, and a persistently high unmet need for contraception. The contraceptive prevalence rate of 29 percent is increasing; yet unmet need continues to be very high and 15 percent of married women desiring to space or limit births are unable to access family planning services. Moreover, abortion rates are estimated at 1 per 10 live births, and abortion complications are a major contributor to maternal deaths. In addition, a third of girls under the age of 19 are mothers, and adolescent pregnancies are particularly at risk for maternal and neonatal mortality. Thus, it is unlikely that Madagascar will meet this MDG given the target of 149 per 100,000 live births in 2015.

The nutritional situation of Malagasy children has not improved and no progress has been made towards achieving the first MDG. Madagascar remains one of the countries in Africa with persistently high rates of chronic malnutrition; stunting affects almost half of children under the age of five (46 percent) with half of these being severely stunted. By the age of 24-35 months, an age after which stunting is difficult to reverse, more than half of children are nutritionally at risk. There has been improvement in moderate underweight incidence but none in the incidence of stunting. The prevalence of anemia, an underlying cause of chronic ill health, is very high among women and children. One in two children between 6 and 59 months and a third of women are anemic, however, anemia prevalence is decreasing, especially in rural areas.

With respect to communicable diseases, the malaria and HIV/AIDS related MDG is still achievable notwithstanding the political crisis, although more efforts need to be made on tuberculosis (TB). Malaria-related mortality has decreased; although prevalence of prevention activities is not wide-spread, it is improving and in 2008, almost half

the children and pregnant women slept under an insecticide-treated net. Madagascar is considered an anomaly to the HIV/AIDS epidemic since prevalence is very low, estimated at under one percent, despite a high prevalence of sexually transmitted infections in most-at-risk groups, especially syphilis. TB prevalence, incidence (respectively 417 and 251 per 100,000 population in 2007) and mortality are significantly lower than in most neighboring countries but on the increase. Madagascar is one of five African countries most heavily affected by plague. Bilharzias affects a third of the population with more than 80 percent of the country at risk. After India and Brazil, Madagascar has the highest prevalence of leprosy in the world with 1,521 cases reported in 2007. Finally, infectious and parasitic diseases are major contributors to morbidity and mortality.

Behaviors Conducive to Better Health Outcomes

Health care seeking behavior for preventive child health services at the health facility level is improving. Complete immunization coverage stands at 62 percent in 2008 (for children 12 to 23 months), but there are still large differences in coverage across regions, place of residence, and income groups. Vitamin A supplementation coverage is high and relatively equal across regions. At the same time, fewer mothers sought treatment when children showed symptoms of acute respiratory infections (ARI): only 42 percent of children under-five with a cough and breathing difficulties were brought to a health center in 2008 compared to 48 percent in 2003.

At-home behaviors conducive to better child health are not improving. Most women breastfeed their infants; however, only half are exclusively breastfed in their first six months of life, and the trend has stagnated in the past ten years. Knowledge and utilization of at-home treatment of diarrhea with oral rehydration treatment (ORT) is very low, varies across geographical regions, and favors the richest and the most educated. The prevalence of diarrhea is low and decreasing (18 percent in 2003/04 to 8 percent in 2008/09, mostly among 6-23 months) but with wide geographical variations. Although Madagascar was one of the first countries in the world to introduce zinc to complement ORT as treatment for diarrhea, until recently, there have been little results. The level of knowledge about child nutrition and care is dismally low: 75 percent of mothers are only able to identify one or two common causes of diarrhea among children, and 10 percent fail to point out any correct causes.

At the community level, there are a number of factors and behaviors that affect the nutritional status of children. The 2004 anthropometric survey indicated that community characteristics have a significant effect on malnutrition: children living in rural areas have, on average, higher malnutrition rates than those in urban centers, and access to safe water, electricity, health and transportation infrastructure diminishes significantly the prevalence of underweight children. Seasonal patterns also deeply impact the nutritional situation of at-risk groups, especially in the chronically food insecure areas such as the South and the South-East of Madagascar.

Madagascar stands out as one of the few African countries which sustained its commitment to combating malnutrition through the implementation of a large-scale community-based nutrition program, targeting children from a very young age and employing a preventive approach to promote behavioral change based on existing resources, with locally adapted messages. The objective is to improve nutritional status with a preventive approach that promotes behavioral changes in feeding, hygiene and child

care practices. The program had a positive effect on child-care practices (breastfeeding behavior, weaning practices, treatment of illnesses, and hygiene practices), nutritional knowledge, and maternal self-efficacy. Nonetheless, nationally, the prevalence of correct child-care knowledge and practices remains low.

Although there has been some progress in certain maternal health indicators (such as family planning and child spacing), others remain problematic (increasing adolescent pregnancies and decreasing assisted deliveries). More women than before are using modern contraceptive methods, especially in rural areas; however, there are wide geographical differences. Women rely heavily on short-term methods, such as injectable contraceptives and oral tablets. Moreover, although decreasing in the past five years, unmet need remains a serious constraint for women in Madagascar and in 2008, one in seven women who did not want more children or wanted to wait at least two years before having another pregnancy did not use modern methods of contraceptives. Adolescents begin their reproductive life very early: more than a quarter of teenagers between 15 and 19 years old had at least one child, and 5 percent did so at 15 years of age or younger at the time of the 2008/09 DHS.

Furthermore, more women than before attend an antenatal care (ANC) visit with a skilled professional. However, while more women deliver in a health center (35 percent according to 2008/09 DHS), fewer of them (44 percent) seek a medically trained professional during delivery. Unlike for all other behavioral changes for which indicators in rural areas have improved, the decrease in delivery assistance is attributable to poorer coverage in rural areas and in the capital. In 2008, the Ministry of Health (MoH) introduced safe delivery kits, for both normal and cesarean deliveries, making deliveries free-of-charge at the health center and hospital levels, but the effect of this policy has not been evaluated. Although child spacing has improved over the last ten years, nearly one in four births occurred less than 24 months from the preceding one. Finally, the high abortion rate contributes greatly to maternal mortality.

There have been marked improvements in behaviors preventing communicable diseases. Progress on malaria has surpassed regional control efforts. Utilization coverage of insecticide treated nets by children under-five is double the average of other countries in the region, and has increased three-fold during the past four years. HIV/AIDS prevention knowledge remains moderate among the most-at-risk populations but behavior is slowly changing: condom use is slowly increasing and the proportion of those who have multiple partners is decreasing. While voluntary testing is not widespread, there have been remarkable improvements for all at-risk groups. Rates of sexually transmitted infections (STIs), in particular syphilis, are extremely high in Madagascar among most at-risk populations and in response, a broad national STI control program was launched in 2003 focused on the promotion and use of STI treatment kits. Adherence to TB treatment is improving and a pilot program that fully subsidizes treatment costs had significant results.

Despite these improvements, inequalities in access to health services persist and occur most dramatically across households rather than across districts or regions. Financial barriers and physical access are among the main reasons preventing adequate access to health services; but the main reason is that illnesses are too often not recognized as serious. The Government has introduced measures to ease financial access bottlenecks, including an equity fund to cover the cost of drugs for the poorest. Ensuring financial

and physical accessibility to health care is necessary but not sufficient to guarantee that households seek care when ill. Knowledge about curative services for common illnesses (diarrhea, malaria, ARI, persistent cough) is lacking, and in most cases, the illness is not considered serious enough to seek healthcare.

Health System Performance

The health delivery system is aligned with the administrative structure of the country and includes the central, regional and district levels. Treatment is sought at public health centers (45 percent), private health clinics (34 percent) or at traditional healers. Basic health centers are the first point of contact followed by district and regional hospitals, and there are 3,347 medical facilities in Madagascar, 80 percent of which are public. Madagascar ranks very low among African countries in terms of hospital care availability with an in-patient beds density of only three beds per 10,000 population. The public drug supply chain starts at the central level with SALAMA, the semi-autonomous central drug procurement agency, which supplies the district pharmacies, who in turn provide drugs to the health centers. Since 2008, the MoH has adopted a plan for integrated supply chain and logistics for the procurement and distribution of essential health commodities, which integrates the regions into the drug delivery system.

Madagascar, like thirty-five other African countries, is confronting a critical shortage of health workers. While the physician density is one of the highest on the continent, 2.91 doctors per 10,000 population, nurses and midwives are scarce, with 3.16 personnel per 10,000 population. The resulting ratio of nurses and midwives to physicians (1.1) is the second lowest in Africa. Community and traditional health workers (CHW) have a relatively small share in the health system compared to other countries in the region, less than 1 CHW per 10,000 population. Finally, the proportion of health management workers in the health workforce (0.5) is one of the highest in Africa. Health workforce exit is a moderate problem in Madagascar compared to other countries in the region, however, anticipated retirements will strain human resources going forward. Annual losses due to premature mortality are comparable with other countries in the region, despite the low HIV prevalence. Beyond the shortages in terms of numbers, there are major imbalances in the distribution of medical staff across rural and urban areas and across the various levels of service delivery: only around 28 percent of doctors serve 75 percent of the population living in the rural areas. Salaries in the public sector are based on seniority whereas for private medical personnel they differ depending on qualifications, the kinds of specialized services available and location of facility.

In addition to the public services, a number of private health facilities also exist. Generally, these fall into two categories: the not-for-profit managed by faith-based groups or NGOs and the for-profit health clinics managed by private individuals. Once operational, all not-for-profit primary health centers are required to adhere to the MoH norms and regulations, and must integrate their work programs into the district health planning. In addition to these two main types of private services (profit and not-for-profit), two other types of facilities exist: para-public and inter-enterprise.

Quality of health service delivery continues to be problematic. Five dimensions of quality that reflect major health system issues were used for analysis: (i) infrastructure quality and staffing distribution, (ii) availability of drugs at the public health center's

pharmacy, (iii) compliance with diagnostic procedures for outpatient visits, (iv) quality of ANC visits, and (v) frequency and quality of supervision.

According to the 2005 facility survey, overall public health facilities were in a worse state than the private ones in terms of infrastructure, personnel to patient ratio, and transportation availability.

Availability of drugs in the system is poor and declining. A survey on Bottlenecks in the Supply Chain collected data in 2006 and 2007 on availability of drugs and concluded that not one health center reported a full stock of drugs, with the most acute shortages for anti-inflammatory drugs, vitamin A, and ORT. There are two main reasons for such poor performance: (i) the slow and problematic supply chain between the district pharmacy and SALAMA (it takes approximately one month between the time when districts place their orders with SALAMA and actual delivery); and (ii) irregular payments of some community pharmacy's dispensaries.

The suspension of user fees between September 2002 and December 2003 had a significant negative effect. The gratuity of health services resulted in a lagged increase in utilization of outpatient services, which put pressure on the supply chain for drugs, which was ultimately unable to meet this demand. The re-introduction of user fees brought the proportion of prescriptions filled back to its pre-crisis levels; however, it affected the attendance of some health services. While no changes were observed in children immunization visits, normal deliveries, and prenatal care consultations, important surgical interventions, caesarians, and laboratory tests decreased.

Moreover, misdiagnosis and erroneous treatment of common illnesses occur in some health centers, although there are no significant differences between the public and private (faith-based and non-faith-based) health centers in diagnosis performance. Incorrect diagnosis of malnutrition and anemia is of concern across all centers. Although the diagnosis of certain illnesses, such as severe malnutrition, is done following a pre-defined protocol, a high number of providers are not correctly identifying patients needing to be referred to the hospital level.

The quality of health services received by the poor is worse than that received by those better-off. Quality of antenatal care has been used as a proxy for quality of overall health services and varies substantially with location, poverty, and education. For instance, the quality of visits, as measured by whether blood and urine tests are provided, greatly correlates with income and location. Moreover, inequalities occur not only for preventive interventions that require access to laboratories, or depend on availability of supplies at the health centers but also for the provision of basic information, such as whether or not pregnant women are made aware of the signs of potential complications. Poor quality outcomes of health services are mainly attributable to a few specific health centers, given that the majority of health centers complied with the existing protocol for antenatal visits. Referral and emergency services are generally difficult to access for women, particularly in rural areas. Quality of services provided in the private sector is also of concern since there is no national policy to effectively engage the private facilities in achieving the Government's health objectives.

Quality of service delivery is very much influenced by the frequency and quality of supervision. A 2005 facility survey showed that 86 percent of public health centers were supervised at least once in the six months preceding the survey (more than half in the previous month). Nonetheless, supervision of public health centers tends to be deficient and of poor quality.

Sector Financing

Public funds account for half of the financing of the health system, followed by private and donor funds. Dependency of the sector on donor aid has improved since 2003, and is in line with other African countries. Out-of-pocket payments for both public and private facilities are the main source of private financing, which is an indicator of the potential inequities in the health system, given poor people's limited ability to pay and their lack of participation in risk pooling mechanisms. Budgetary allocations to the MoH have increased but remain below the sector's needs and international standards, but spending is a key challenge. With respect to the composition of the budget, the non-salary recurrent budget continues to be insufficient, affecting service delivery quality and sustainability of the investment program. In 2008, the MoH budget prioritized the fight against diseases (32 percent) and payment of salaries (27 percent); however, mother and child survival and development only garnered 5 percent of the budget and family planning, 1 percent.

The health sector continues to be plagued by poor budget execution, especially of donor-funded investments. According to Ministry of Finance and Budget (MFB) statistics, the MoH typically manages to execute less than two-thirds of its budget, on account of low execution of the investment budget and errors in budget preparation. Shortcomings across the budget cycle also contribute to this weak implementation performance. The introduction of a budget program concept in 2005 was designed to improve the links between sector policies and budgeting and overall monitoring of the budget, contributing to improvements in the budget preparation process. Nonetheless challenges remain. Even though simplification efforts have been made by the MFB, numerous and cumbersome expenditure procedures still exist, limiting the MoH's ability to efficiently execute its budget. The advantages of the budget program, including flexibility to shift expenditures, are also not fully capitalized. Insufficient technical and institutional capacity hampers procurement while there is inadequate flow of information. Lastly, the many reporting requirements constitute a severe administrative burden on the MoH. A number of budget reforms have been carried out in recent years, including coaching and training, dissemination of guidelines, information technology support and staffing. However, since the country has been in crisis since the beginning of 2009, it is not clear whether these accomplishments will be sustained.

Fairness of the financing system in terms of its impact on access to and utilization of health services is a key measure of performance. Even though the Government made efforts to devote more resources to priority areas in the health sector to achieve the MDGs, the MoH continues to face critical allocation decisions and the budget remains largely centralized. Furthermore, the recurrent budget of the MoH is unequally distributed due to a lack of clear criteria for equitable distribution of health resources across regions and districts.

The main challenge is to establish adequate mechanisms to pool health risks and provide financial protection to the population. One such mechanism is the Equity Fund, which grew out of different experiences with the elimination of user fees and introduction of a new cost recovery system, FANOME, in 2005 to facilitate the replenishment of essential medicines and supplies by the health centers. A certain percentage of the FANOME was then placed in an Equity Fund designed to provide free access to medicines for the most vulnerable segment of the population without putting an additional burden on the health budget. The program somewhat succeeded in targeting the most vulnerable population; but coverage remains low and not all Equity Funds are being used.

Key challenges include targeting of the poor, low use by beneficiaries due to stigma and lack of information, and weak accountability and monitoring. The financial solvency of the Equity Funds is precarious since it depends on utilization rates at the health center. Equity Funds have been also gradually introduced at the hospital level. Although the coverage is low and geographical barriers remain, experience with the hospital Equity Funds appears encouraging.

Health insurance schemes are limited. Madagascar has all the elements of a state-based system as the MoH is the main provider of health services; although it is neither equitable nor efficient. While advantages of social insurance schemes include the substantially bigger risk pool and the potential for redistribution of resources, the narrow base of formal employment in Madagascar constrains the development of such a compulsory insurance. International experience with community-based health insurance, which has existed in Madagascar for over ten years, suggests that such schemes can form part of a transition to a more universal health care coverage system. However, there are shortcomings, including limited income of the community and voluntary membership, which reduces the size of the risk pool. Finally, private/voluntary health insurance is limited as only a minority of the population is willing and able to afford unsubsidized voluntary insurance.

While mobilizing resources for the sector is important, efficient and equitable utilization of public resources is equally critical. Relating child mortality rate with per capita health expenditure in several SSA countries suggests that Madagascar manages some of its resources in an efficient manner. The distribution of resources to the different health functions generally gives priority to the most cost-effective interventions to ensure health improvements, although allocations to maternal health programs remain low at less than 8 percent. To render the health system more efficient, the Government began to implement a decentralization policy, but in practice, the country remains highly centralized. In recent years with the additional focus on achieving the MDGs, various tools have been developed to calculate the per capita cost of achieving health-related MDGs, such as Marginal Budgeting for Bottlenecks, which was used in Madagascar to develop the last two health Medium Term Expenditure Frameworks, 2006-2008 and 2009-2011. In addition, the MoH in cooperation with partners identified and costed a minimum package of sustainable and cost-effective health services; but its implementation has been put on hold since the beginning of the political crisis in 2009.

Although a key priority is to increase the efficiency and equity of health spending, it is clear that the current funding level is very low relative to needs. Once shortcomings in absorption capacity are addressed, larger increases in public health spending could be considered. Budget reallocation is a difficult exercise and low-income countries typically have only limited room for additional borrowing. Despite efforts to increase tax collection, tax revenue continues to be low, at less than 12 percent of GDP prior to 2008. In the short-term, donor funding seems to be the main alternative for scaling up health expenditures and mechanisms are available to increase aid effectiveness, such as harmonization of donor aid.

The political crisis since early 2009 has dramatically altered the country's economic performance and access to financing. Aid flows to the public sector have been severely cut by the decision of some donors to suspend or reduce their disbursements following the change in government. This situation is putting at risk the progress made in the health sector to date.

Strengthening Accountability in the Health Sector

Improving governance through greater accountability for health services is crucial, and an area in which many improvements can be made. This can, nevertheless, be a particularly challenging undertaking as the health sector is naturally characterized by information asymmetries (with patients often lacking medical knowledge), and moral hazard issues on the side of consumers and providers. Three dimensions of accountability are explored: financial, performance and political/democratic.

Madagascar's governance ranking had improved up until 2008 and was higher than most low-income countries. The country's progress until the crisis was also reflected in the 2008 Country Policy and Institutional Assessment scores. Madagascar's Corruption Perception Index score improved overall since 2005 despite a dip between 2008 and 2009. Governance improvements up to 2008 are in part attributable to efforts to fight corruption and improve transparency since 2002. The Government also recently implemented a number of important reforms to improve financial accountability in the health sector. The political evolution in 2009 has cast a cloud of uncertainty about future reforms and the sustainability of the most recent ones and despite progress, the unfinished agenda remains substantial.

Negative perceptions regarding the levels of corruption in the public health care system, and findings from the recent PETS point towards a myriad of problems hindering financial accountability in the sector, including inadequate planning and budget practices, weak budget implementation, as well as ineffective reporting structures at all levels of the system. Despite recent legal changes, health sector financing remains largely controlled by the central authorities. At district, commune and provider (hospital and clinic) levels, discretion for health spending is still limited. Moreover, the current allocation formula for health resources does not take into account demographic and socio-economic differences across regions. Despite the introduction of promising reforms in planning and budgeting at all levels of the health system, results are limited. At the regional level, Annual Work Programs are not used as tools to improve resource allocations and efficiency, but tend to reflect previous years' spending trends. Moreover, budget execution is a complicated process, and the many procedures involved not only burden central and local executive agencies, but can also substantially affect the degree of financial misuse. Monitoring accuracy of available reporting is crucial to improving accountability and reducing leakages, but is limited in practice.

Leakages in the pharmaceutical supply chain and problems linked to the accounting of the FANOME are important concerns. Almost three out of four health center-level pharmacies report leakage in the supply chain from district to commune levels. Leakage varies substantially across drug types, remoteness of health centers, degree of management, level of education of the health center director, and regularity of payment of medicine dispensers. The reasons for these governance issues relate mostly to weak capacity for accurate accounting and poor monitoring of accounts.

Performance accountability concerns accountability of policy makers and service providers with regard to the policies and outcomes they set. Health services are to be provided in conformity with norms and standards set by the MoH, but monitoring compliance is limited. Supervision is a key component of sub-national monitoring but the frequency and quality varies: around three-quarters of health centers received a supervision visit during year preceding the 2007 PETS, but monitoring decreased over time.

While health center heads are required to attend monthly meetings at the district level that include financial reporting and programmatic/technical oversight, information on regular attendance is limited. Management of human resources for health, another dimension crucial for performance accountability, is highly centralized. District health offices have limited ability to address performance issues, since salary matters related to performance are beyond their responsibility. Absenteeism rates for health workers are below those of many SSA countries, but they still can undermine service delivery. While incentives appear to be important determinants of absenteeism, the results indicate that (current) financial incentives might be less effective than in-kind ones like housing. Recent initiatives aimed at improving health worker productivity are promising, but linking payment to performance requires close monitoring and evaluation.

Performance-based approaches hold potential for increasing performance accountability and have been implemented on a pilot basis, including performance based contracting to civil society and/or private providers in remote rural areas, and results based financing (RBF) to increase utilization of basic maternal and child health services. Besides RBF's potential to improve financial flows, reduce corruption, and increase financial management, it also can strengthen health systems and foster empowerment. Despite the substantial potential benefits of RBF, successful implementation requires mitigating certain risks associated with the approach, including monitoring of outcome indicators by an independent agency. Proper evaluation mechanisms need to be put in place to ensure that progress in outcomes observed can actually be attributed to the RBF mechanism.

Political or democratic accountability relates to the participation of communities, citizens, or political entities in demanding accountability from the health care system. Until the recent piloting of Community Score Cards (two pilot phases between 2006 and 2008), there was only a limited scope for users to promote accountability. Initial evaluations of these social accountability tools point towards substantial success with user satisfaction levels as well as selected outcome indicators improving.

Introduction and Context

Country and Sector Context

With an income per capita below US\$400 in 2008, Madagascar is one of the poorest countries in the world. Poverty in Madagascar is widespread, with over two-thirds of the population living below the poverty line. There are also significant urban-rural differences (52 percent versus 74 percent), although between 2001 and 2005, poverty declined more rapidly in rural areas than in urban areas. Seventy percent of Madagascar's rural population cannot afford to buy the basic food basket. Not surprisingly, health outcomes are distributed inequitably across the population.

Health, nutrition, and the fight against communicable diseases and HIV/AIDS are key goals of Madagascar's poverty reduction strategy, the Madagascar Action Plan (MAP) 2007-2012. In line with the MAP, the Ministry of Health and Family Planning (MoH) developed the National Health Sector and Social Protection Development Plan (PDSSPS) for the period 2007-2011, which seeks to strengthen the health system and improve service delivery to reduce neonatal, child and maternal mortality, and control illnesses such as malaria, tuberculosis, sexually transmitted infections (STIs), and HIV/AIDS. Madagascar also has a National Strategic Plan for HIV/AIDS 2007-2012, the goals of which are to maintain prevalence below two percent among at-risk groups, and below one percent in the general population, and improve the quality of life for people living with HIV/AIDS.

Government has been increasingly committed to addressing malnutrition, resulting in the development of the National Nutrition Policy in 2004, and the National Plan of Action for Nutrition 2005-2009. In line with the Millennium Development Goals (MDGs) and the MAP, the goal of this strategy is to reduce by half the prevalence of chronic malnutrition in all children under-five. The key pillars of the strategy include promotion of exclusive breast-feeding and timely complementary feeding, integration of nutrition interventions at the primary health care level, extension of the community-based nutrition program to new districts and the creation of a national surveillance system for food security and nutrition.

However, the political situation in Madagascar remains fragile. In January 2009, political tensions erupted and led to a military-backed extra-constitutional transfer of power and the consequent establishment of an interim de facto Government (*Haute Autorité pour la Transition*) on March 17, 2009. The transitional Government is not recognized by the international community (United Nations, European Union, African Union and Southern African Development Community). As of the one year anniversary of this change, the macroeconomic situation remains fragile with the full impact of the 2009

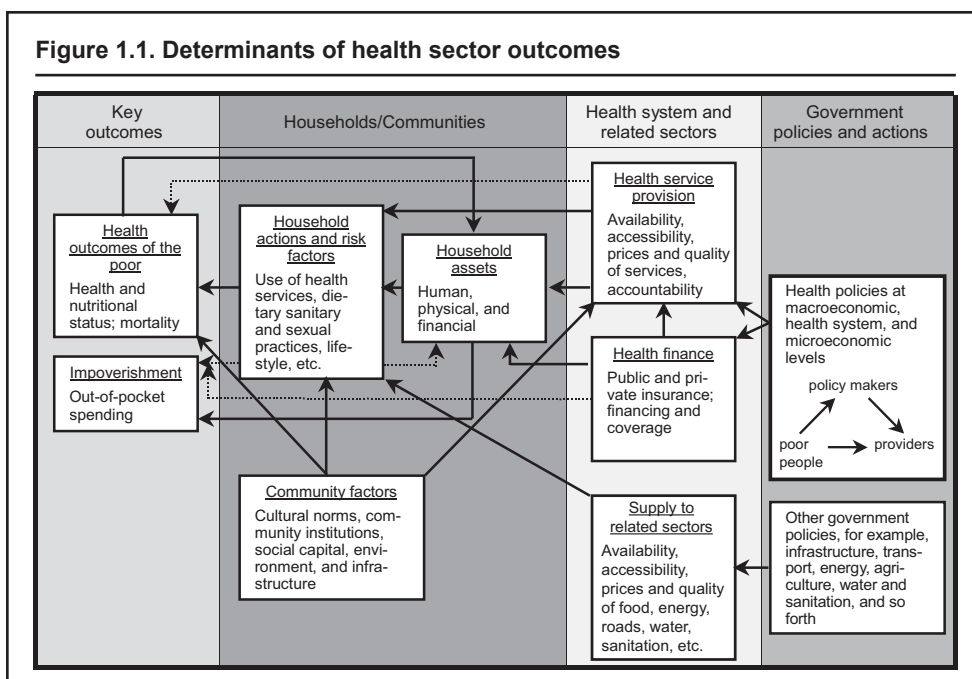
political crisis as yet unknown, but it is likely to have had a similar, if not worse, impact on growth as the 2002 political crisis. Moreover, many development partners, including the World Bank, suspended or reduced aid in the sector and are likely to resume only once presidential elections have been held and a recognized government is in place. A multi-donor assessment of the impact of the crisis on the health sector was completed in July 2009 based on anecdotal evidence and complements the analysis in this report. However, no in-depth survey or study has been undertaken to track the impact of the crisis on the population; therefore, the impact on the sector or on key health indicators is as yet unknown.

Objectives and Organization of the Country Status Report

A wealth of pre-crisis health sector data exists. The health sector has benefitted from increasing investment over the last few years and a number of studies and surveys have been carried out to evaluate the impact of these investments, providing a wealth of information that has not been analyzed in a complementary way. This Country Status Report (CSR) thus seeks to capitalize on all of the existing data in the health sector, compare Madagascar to countries of similar income levels and assess the results achieved by the health system.

The CSR provides an analysis of the population's health and nutrition status by examining the links between health outcomes, household/individual behaviors, community factors, government interventions, and service provision. An important objective of public health policy is to improve health sector outcomes, by reducing mortality and morbidity rates and improving the nutritional status of the population. A government has multiple instruments to pursue this and other development objectives, only one of which is to improve the delivery of public health and private clinical services. Figure 1.1, adapted from *A Sourcebook for Poverty Reduction Strategies*,¹ shows the causal chain from government health policy on the right, through the health system and related sectors, to the household and communities, and finally to the key outcomes. Other government policies outside the health sector impact the rate of economic growth and the availability of community-level infrastructure and social institutions (represented in the figure by the two boxes entitled "household assets" and "community factors"). The quality and accessibility of government and private health services, together with the household's income, education, and knowledge, influence the household's risk behavior and the achievement of its health (and non-health) objectives.

Health service provision is affected by both top-down government policies and by the direct influence of households as shown by Figure 1.1, which has been modified slightly from previous versions to better demonstrate this. It shows that the link between households (in the second column) and health care providers (in the third column) runs in both directions. While service provision can indeed affect health service quality and utilization (arrow from right to left), households can directly influence service provision either through their buying power or through direct political influence (arrow from left to right). Within Figure 1.1, which maps most determinants of health-related outcomes, the box on service provision deserves special attention, because the provision of high-quality, accessible health and curative services is a principal responsibility of the MoH and arguably, a chief concern of public health policy. In addition to availability, quality, and affordability of services, the accountability of health sector personnel affects utiliza-



Source: World Bank, 2002, *A Source Book for Poverty Reduction Strategies*, Vol. 2, ch. 18, p. 207, figure 18.3.

tion. The box for government policies has therefore been amended to include the phrase “accountability policies” with the belief that these deserve special mention as important determinants of service provision. The triangle inside this box (which is the analytical framework of the 2004 World Development Report²) highlights the fact that health care providers are agents of, and therefore are accountable to, both the poor people whom they serve and the policy makers who employ them or regulate their activities. An extensive analysis of governance and accountability issues is presented in Chapter 5.

The CSR offers a diagnostic of the health nutrition and population sector organized to follow Figure 1.1 sequentially from left to right: (i) an analysis of the trends in health outcomes with a focus on MDGs; (ii) a study of the behavioral determinants of these outcomes at the individual, household, and community levels, and an evaluation of inequalities in utilization of health services; (iii) an analysis of the performance of the health system; (iv) a review of sector financing sources, and an assessment of the equity and efficiency of public expenditures; and (v) an assessment of governance and accountability in the health sector in terms of accountability of providers to policy-makers and to the people they serve.

Available Data and Reports

In addition to the Demographic and Health Surveys (DHS) for 1997, 2003/04, and 2008/09 (for which preliminary results are available), the Malagasy health system has benefited from a number of surveys that analyze the relationships pictured in Figure 1.1. In 2003, the National Institute of Statistics (INSTAT) conducted a survey of 153 public and private health facilities (the *Study of the Efficiency and Equity of Health Facilities*, or EEEFS). Data was collected to measure the quality of health care delivery in each facility

and the degree and determinants of efficiency. In 2005, INSTAT carried out the same survey on an expanded sample of 275 health facilities. The second study included only basic health centers, and the sample of public health centers was expanded from 68 to 153, the private non-religious center sample from 49 to 58, and the private religious center sample from 14 to 64. The results were not published; however, the available data was analyzed for the performance evaluation in this report.^{3,4} In 2006, in-depth surveys were carried out as part of the Poverty and Social Impact Assessment (PSIA) at 17 basic health centers and 34 communities in three provinces⁵ to assess the equity of the health system and evaluate the implementation of the cost recovery policy and use of Equity Funds. These surveys revealed the difficulties the poor face in accessing public health centers.

Other major nationally representative pieces include national Household Surveys rolled out every two years since 1997, as well as National Health Accounts (NHA) for 2003, with a second under finalization based on 2007 data. An Epidemiological Profile and an analysis of the determinants of HIV infection was undertaken in September 2008 as well as Biological Surveillance Surveys and Behavior Surveillance Studies in 2004, 2006, and 2008. In addition, smaller surveys were undertaken, such as the Public Expenditure Tracking Survey (PETS), Bottlenecks in the Supply Chain of Pharmaceuticals, and Absenteeism of Health Sector Workers, using data sets from 2006 and 2007.⁶ Several nutrition surveys have also been undertaken over the last ten years, including three rounds of Anthropometric Surveys, longitudinal at the community level, spanning 1997/98, 2004, and 2007.⁷ Two commune surveys were undertaken in 2002 and 2004 to assess the economic and social impact of the 2001/02 political crisis, as well as the impact of the suspension of user fees in the public health sector.⁸ Finally, two Commune Censuses were undertaken in 2001 and 2007, which include detailed information on demographic and socio-economic characteristics of all communes in the country, and a qualitative and quantitative survey in 2004 capturing key quality aspects of services by non-governmental organization (NGO) providers, measured by their physical and human resources as a proxy, and organizational structure.

Notes

1. Claeson, M., Griffin, C. C., Johnston, T. A., McLachlan, M., Soucat, A. L., Wagstaff, A., et al. (2002). Health Nutrition and Population. In J. Klugman, *A Sourcebook for Poverty Reduction Strategies* (pp. 201-230). Washington, DC: World Bank.
2. World Bank. (2004). *World Development Report 2004: Making Services Work for Poor People*. Washington, DC: World Bank, page 6.
3. INSTAT. (2005). *L'Éfficiency et l'Équité des Formations Sanitaires Malagaches: Résultats d'une enquête*. Institute National de la Statistique Madagascar, Direction des Statistique des Ménages. Washington, DC: World Bank.
4. INSTAT. (2005, November). Survey on Efficiency and Equity of Health Centers (only raw data is available).
5. Antananarivo, Majunga, and Tulear.
6. The findings and the relevant policy recommendations are summarized in Sharp, M. and Francken, N., "Service Delivery in the Education and Health Sectors in Madagascar" 2009, DRAFT.
7. The first two surveys are nationally representative, while the last excludes big urban centers but includes tests of child development outcomes for children aged 3-6.
8. Minten, B., & Ralison, E. (2005). Dynamics in Health Sector:2002-2004. In *Dynamics in Social Service Delivery and the Rural Economy of Madagascar: Descriptive results of the 2004 Commune Survey* (p. Chapter 3). Ilo Project, Cornell University.

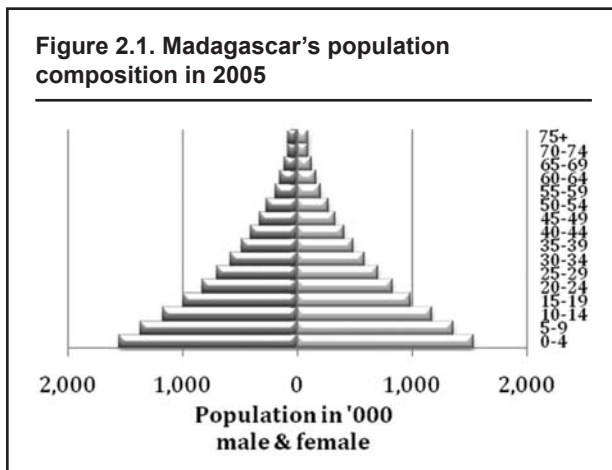
Sector Outcomes and Demographic Trends

This chapter reviews progress on the most important health and population outcome indicators in Madagascar prior to the 2009 political crisis, and compares the achievements to those of other countries of similar income levels. It also provides an analysis of the burden of disease of the population in general, and on maternal and child health outcomes in particular.

Demographic Trends

Life expectancy in Madagascar is steadily increasing. It was estimated at 59.4 years in 2007, in contrast to many African countries affected by the burden of HIV/AIDS,¹ and is expected to increase to 64 years by 2025. Given the country's per capita income (an index measure for standard of living), life expectancy at birth is better than expected based on an international trend-line fit. In 2000, Madagascar's life expectancy at birth was 56.3 years while the per capita Gross Domestic Product (GDP) was US\$240 (constant 2000). Although the macroeconomic and political crisis in 2001/2002 prevented any significant gains in per capita GDP, life expectancy increased by 5 percent to 59.4 years by 2007, while GDP per capita increased modestly to US\$246 (constant 2000).²

But Madagascar is facing rapid population growth and the population is very young, with 44 percent under 15 years of age. Estimated at 19.5 million in mid-2009, Madagascar's population is expected to more than double by 2050 to reach 42.3 million.^{3,4} Compared to other Eastern African countries, the country is more urbanized with 30 percent of the population in 2005 living in urban centers, of which 9 percent live in large cities.⁵



The population is very young, with 44 percent under 15 years of age as pictured by the wide base and the very narrow top of the population pyramid in Figure 2.1.

By 2025 the share of the population under 15 years of age will decline, while the

Source: World Development Indicators, 2009.

percent of the population in the working-age group will increase. The share of the population in the younger age groups (under 15 years of age) is expected to decline, reaching 36 percent by 2025, and the pyramid will assume a less triangular shape with a narrower base. The total age-dependency ratio (defined as the ratio of the dependent population—children under 15 and adults over 65—to the working age population), which has been increasing in the past decade, is expected to decline from the current 95 percent to 67 percent by 2025, and more than 60 percent of the population will be in the working-age group.

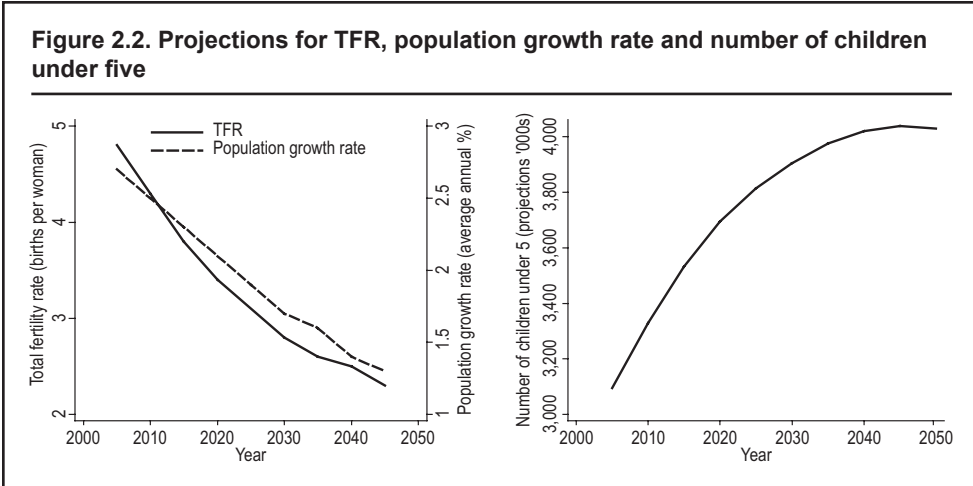
Madagascar is in the final stages of the demographic transition. Infant mortality has been halved in the last ten years and stands at 48 deaths per 1,000 live births. A decline in infant mortality below 100 often marks the beginning of a fertility decline in demographic transitions of developing countries. Such is the case in Madagascar, where the total fertility rate (TFR) has steadily declined in the past ten years and is estimated at 4.8 over the period 2006 to 2008/09. Given this trend, the country (especially the urban areas) is in the final stage of the demographic transition, and the TFR is now expected to rapidly decrease.⁶ While rural areas are lagging behind both in terms of the TFR and related indicators, such as the modern contraceptive prevalence rate (CPR), results have nonetheless accelerated in the past ten years. The CPR quadrupled in rural areas from 7 percent to 28 percent and the TFR was reduced by 1.5 points (between 1997 and 2008/09); however, there is still an eight percent point difference in the CPR between rural and urban areas, and the TFR is 2.3 points higher than in urban areas (Table 2.1).

Table 2.1. Demographic trends (infant mortality rate, under-five mortality rate, TFR, modern CPR)⁷

	Infant Mortality				Under-five mortality			
	2008	2003	1997	1992	2008	2003	1997	1992
Rural	55	75.6	105.0	106.8	84	120.0	173.8	183.4
Urban	45	42.8	77.9	74.7	63	73.3	127.1	142.1
Total	48	57.8	96.3	93.0	72	93.9	159.2	162.8
	TFR				CPR			
	2008	2003	1997	1992	2008	2003	1997	1992
Rural	5.2	5.7	6.7	6.7	28.0	15.9	7.1	2.9
Total urban	2.9	3.7	4.2	3.8	35.6	26.5	17.6	15.8
Capital	2.7	2.7	—	—	38.6	33.4	—	—
Other urban	3.0	4.0	—	—	33.7	24.4	—	—
Total	4.8	5.2	6	6.1	29.2	18.3	9.7	5.1

Source: Demographic and Health Surveys (DHS) 1992, 1997, 2003/04, 2008/09.

There is a downward trend in fertility rates. With sustained Government focus and high-level policy commitment on health and population programs, a significant decline in fertility could be achieved. However, as the left panel of Figure 2.2 suggests, even under the current scenario of continued decline in total fertility (from 6.1 to 4.8 between 1992 and 2008), it will take more than 20 years for it to reach replacement level. Furthermore, since the number of women of childbearing age will continue to be disproportionately high (because of current fertility rates), birth rates will fall, but the number of births will increase and population totals will continue to rise (*population momentum phenomenon*). The right panel of Figure 2.2 illustrates this trend and the increase in number of children under five can be expected to taper off only after 30 years.



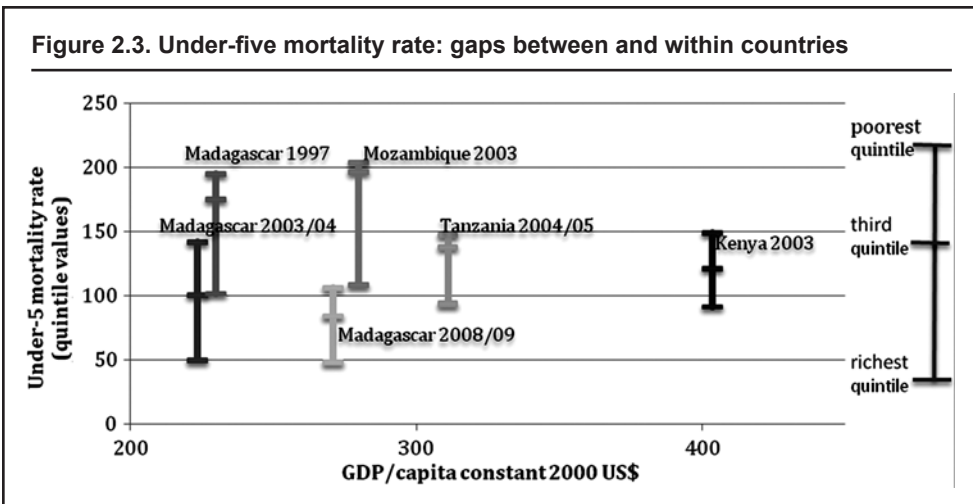
Source: World Development Indicators, 2009.

Child Health

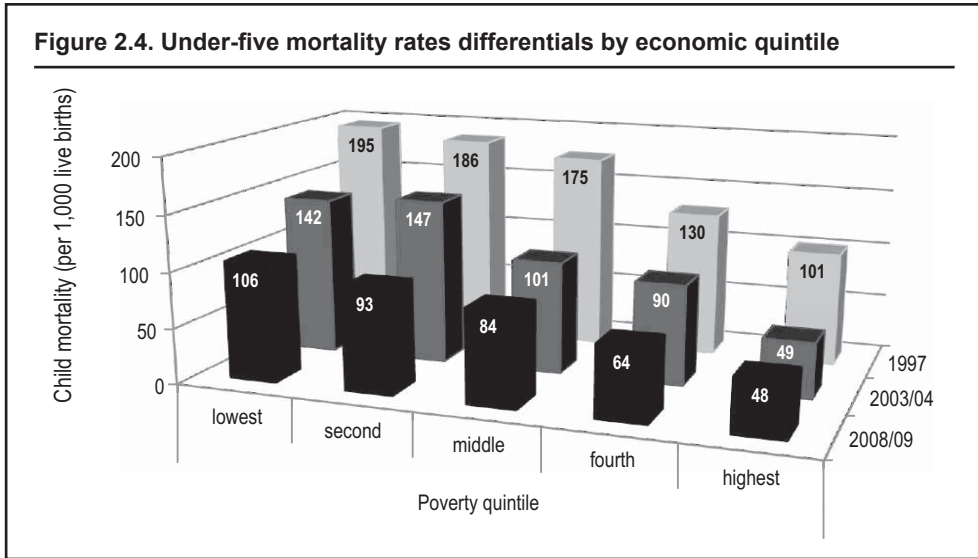
Child health outcomes have improved in recent years and under-five mortality more than halved between 1997 and 2008 and is better than the Sub-Saharan African average.

The child mortality rate (under-five mortality, probability of dying by age five per 1,000 live births) steadily decreased from 159 in 1997 to 72 in 2008, according to DHS. Moreover, this is considerably better than the Sub-Saharan African average of 146 per 1,000 live births.⁸ The infant mortality rate (per 1,000 live births) followed a similar trend during the same period halving from 96 to 48 during the same period, compared to the Sub-Saharan African average of 89 per 1,000 live births.

However, poorer⁹ children have a smaller chance of reaching their fifth birthday than better-off children as shown in Figure 2.3 (for every country, children belonging to the poorest quintile have higher under-five mortality rates than those from the richest quintile, with the gap illustrated by the horizontal bars).



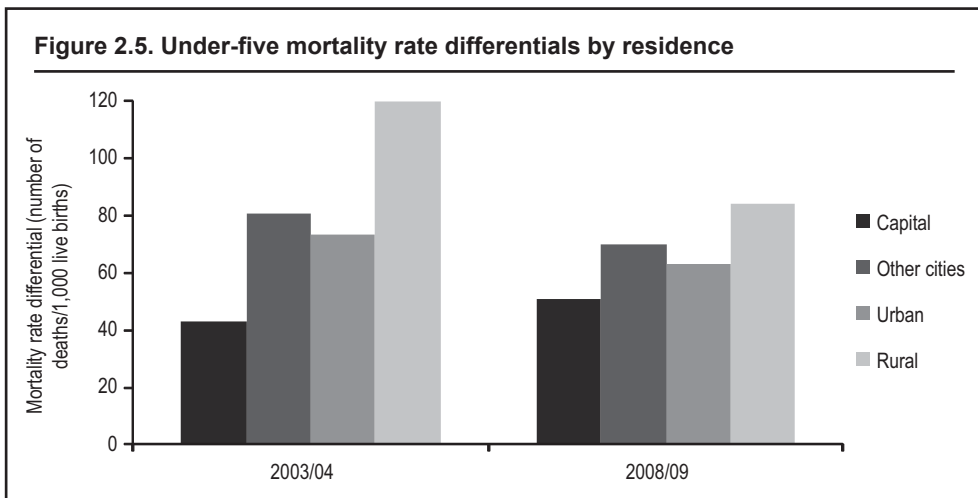
Source: DHS data for under-five mortality rate; WDI data for GDP per capita.



Source: DHS 2003, 1997 and 2008/09.

Nonetheless, the inequality in child mortality outcomes between the richest and the poorest is getting smaller in Madagascar with a remarkable reduction between 2003 and 2008 (Figure 2.4). In 2003, in Madagascar, about 93 more children (per thousand) were dying before their fifth birthday if born in a poor household relative to an affluent home. In 2008, this difference was 48 per thousand.

Child mortality is higher in rural areas and small urban centers than in the capital city but improving at a faster rate in rural areas than in urban ones. Cross-tabulation by residence (Figure 2.5) shows that children are at greater risk in rural areas, but in 2003, this difference was driven mainly by superior outcomes in the capital. The difference was smaller between secondary urban areas and rural areas. The 2008/09 DHS indicates that mortality outcomes have improved for children living in rural areas at a faster rate than for those living in urban centers. Over the last five years, under-five mortality rates have declined by 30 percent (36 per 1,000) while in urban areas, the decline



Source: DHS 2003/04, and 2008/09.

was only of 14 percent (10 per 1,000). However, the infant mortality rate has slightly increased in urban areas (from 43 per 1,000 live births to 45) while there is a substantial decrease in rural Madagascar, from 76 per 1,000 live births to 55 in 2008/09.

There are a number of possible reasons for these large geographical and income differences in child health outcomes. To understand the effect of the determinants of child health outcomes, a multivariate analysis was carried out for three available successive DHS surveys (1992, 1997 and 2003/04.) The 2008/09 DHS data was not available for this analysis. The results are presented in Table 2.2 and summarized below.

First-born child and multiple births face a higher risk of mortality than subsequent children and single-births. The results in all three surveys show that the first-born child faces a risk of death about twice as high compared to the second or third child. Compared to the single-birth children, multiple-birth children had a twice as high death risk in 1992, two and half times in 1997, and more than three times in 2003/04. Thus, multiple-birth children are exposed to higher death risks, possibly due to biological, behavioral, and cultural factors. Multiple-birth babies are often smaller in size at birth (biological disadvantage) and breastfed insufficiently (behavioral disadvantage).

Mother's education has a significant effect on increasing the probability of survival of her children. Mother's education becomes an important factor beyond secondary school, indicating that children with mothers who finished secondary or higher schooling have about forty to fifty percent lower risk of child mortality (DHS 1992 and 1997). Also, the age of the mother at the time of birth is a significant determinant for child mortality across all surveys, with older mothers increasing the risk of child mortality.

Larger households, access to better sanitation and clean water increase the probability of child survival. Larger households lead to greater chance of child survival, most likely due to better availability of childcare and additional sources of revenue for extended families. A household's access to clean water decreases the risk of child's mortality; however, this effect was significant only in 1997. Intuitively, children with access to improved sanitation have a better chance of survival: having flush toilets reduces child mortality by 67 percent and latrine toilets by 22 percent compared to having no toilet according to the 2003/04 survey data.

Children living in the capital and highland areas have a better chance of survival. According to 2003/04 survey, child mortality is about 70 percent higher in rural areas compared to the capital. Compared to the highlands, children are exposed to a higher mortality risk by 43 percent in the coastal areas and by 85 percent in the desert south. This may be due to the nature of illnesses (such as malaria and diarrhea) that contribute to child mortality and are distributed unequally across regions.

It is interesting to note that **when all other variables were accounted for, the availability of quality health services and the level of household income do not have any significant further impact on child survival.** Econometric analysis does not show a statistically significant positive relationship between availability of quality health services and child survival. In 1997 higher coverage of facilities contributed to better child survival, although the effect is very small. Similarly, a very small positive effect on child survival is observed when there is better antenatal care coverage in a district. Furthermore, full vaccination coverage did not change the hazard risk in all years. A similarly insignificant statistical relationship is observed between household income and odds of survival. However, this is not to say that health services and income do not have otherwise positive impacts on health and well-being.

Table 2.2. Results from a Cox Proportional Model on child mortality (hazard ratio)

Dependent Variable = 1 if child is dead, =0 if alive		(1)	(2)	(3)	(4)	(5)	(6)
DHS Year		1992	1997	2003	1992	1997	2003
Child characteristics							
Birth order	1st	1.803***	2.016***	1.824***	1.807***	2.032***	1.825***
	2-3 (Base)						
	4-6	0.635***	0.703***	1.081	0.633***	0.695***	1.062
	7+	0.520***	0.715**	0.938	0.520***	0.699**	0.880
Sex of child	Female (Base)						
	Male	1.022	1.074	1.190*	1.016	1.074	1.194*
Multiple birth	Single (Base)						
	Twin and more	2.032***	2.467***	3.162***	2.031***	2.564***	3.187***
Mother's characteristics							
Age at birth	<20	0.400***	0.406***	0.328***	0.395***	0.405***	0.321***
	20-29 (Base)						
	30-39	1.767***	1.681***	1.927***	1.773***	1.700***	1.958***
	>=40	3.985***	2.982***	3.152***	4.005***	3.049***	3.264***
Education	None (Base)						
	Primary	0.877	0.863	0.917	0.895	0.919	0.976
	Secondary	0.467***	0.537***	0.935	0.479***	0.599***	1.005
Household characteristics							
Household size	household size	0.869***	0.827***	0.762***	0.866***	0.832***	0.758***
	household size ^{Δ2}	1.063	1.142***	1.082	1.066	1.134***	1.089
Drinking water	piped	0.919	0.812*	0.796	0.923	0.798*	0.813
	well	0.968	1.677***	1.185	0.994	1.628***	1.216
	river etc (Base)						
Sanitation	flush toilet	0.636	0.477	0.331*	0.673	0.527	0.338*
	latrine/traditional	0.836*	0.911	0.783*	0.874	0.968	0.796
	nature/none (Base)						
Community characteristics							
Type of residence	capital (Base)						
	city	0.810	1.253	1.428	0.840	1.220	1.460
	rural	0.943	1.236	1.718*	0.958	1.157	1.690*
Region	desert	1.288*	0.923	1.853***	1.236	0.865	1.742***
	coastal	1.171*	1.097	1.434***	1.140	1.026	1.376**
	high land (Base)						
Wealth	Poorest (Base)						
	Poorer		1.085	1.024		1.122	1.025
	Middle		0.896	0.924		0.919	0.963
	Richer		0.697**	0.850		0.763	0.936
	Richest		0.573*	0.678		0.597*	0.749
Availability of service							
Full vaccination coverage (%)				0.998	0.998	0.999	
Antenatal visit Coverage (%)				0.999	0.998	0.993**	
Facility delivery (%)					0.998	0.994***	1.000
Observations		16974	21643	20333	16974	21590	20333

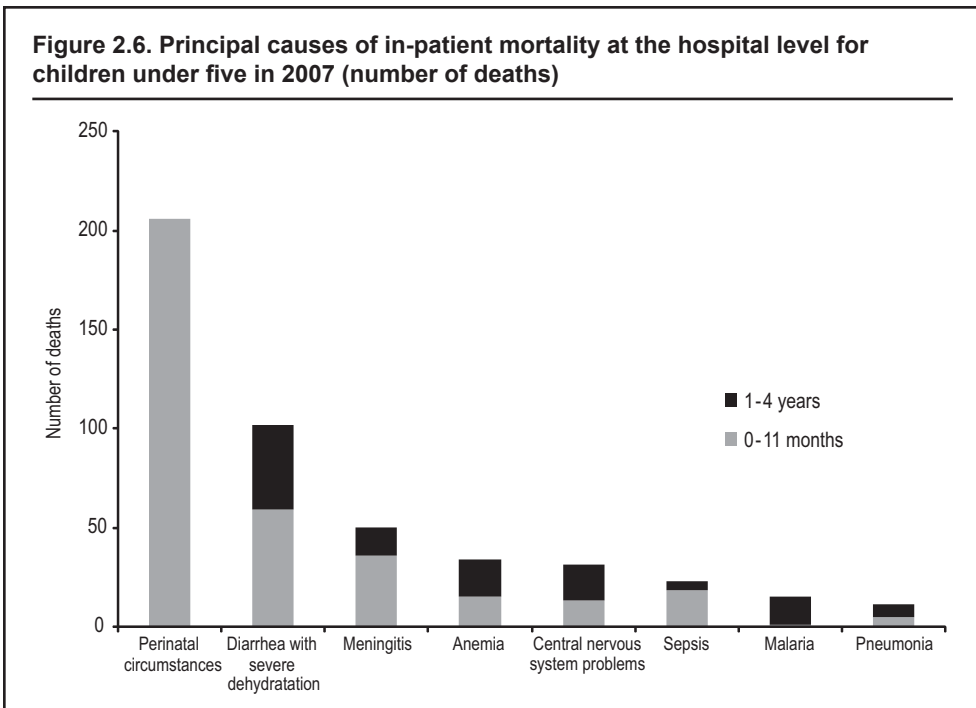
Source: DHS surveys (1992, 1997, and 2003/04.)

*** p<0.01, ** p<0.05, * p<0.1

The top two causes of in-patient mortality were perinatal circumstances, followed by diarrhea-related complications. While there is no accurate data available on burden of mortality for infants and children, some trends can be evaluated by analyzing health facility data. In 2007, at the hospital level,¹⁰ 23 percent of infant mortality was due to perinatal circumstances, linked in large measure to the poor conditions surrounding birth, even when skilled attendance is available. The other major causes of infant mortality were diarrheal diseases, meningitis and sepsis, all of which are readily curable. Juvenile mortality at the hospital level was heavily influenced by diarrheal diseases, followed by anemia and central nervous system problems. While malaria is fourth cause of hospital mortality in Madagascar for children between one and four years old, it is estimated to be the top cause of child mortality in general, which, however, is hard to calculate. Figure 2.6 illustrates the mortality causes of children under five (infant and juvenile mortality combined) at the hospital level.

Since most children are not brought to a health center in case of an illness, the cause of mortality at the hospital level is not representative of the general mortality trend, but can nevertheless draw attention to some important health problems. Also, there are notable differences in malaria mortality between the highlands and the endemic coastal areas and therefore, the contribution of malaria to mortality may be lower in the highlands.

Since 2004, malaria mortality has followed a downward trend in the overall population as well as among children under five years of age both in absolute terms as well as in proportion of all-cause mortality;¹¹ however, the malaria burden is higher in Madagascar than in most of the Sub-Saharan Africa. In 2008, malaria-attributed mortality was 18 percent of deaths of children under five,¹² which represents a higher burden than the



Source: Annuaire des Statistiques du Secteur Santé, MoH, 2007.

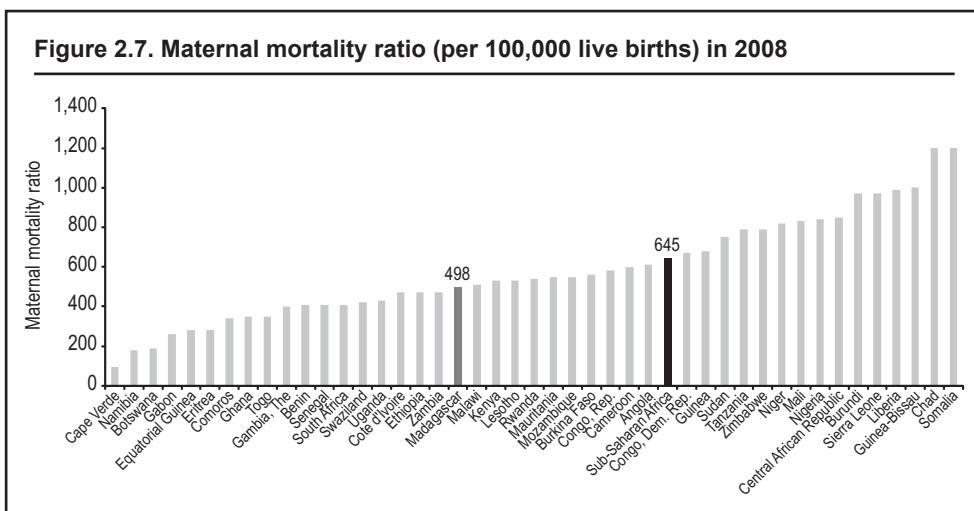
African region estimate of 16 percent.¹³ Furthermore, it is an important cause of morbidity, especially throughout the coastal regions, albeit decreasing between 2007 and 2008 both among adults and children.¹⁴ In 2008, 116,073 cases (6 percent of all outpatient visits) were reported with uncomplicated confirmed malaria among children under five.

While the impact of the current crisis is still unknown, it is likely that child mortality did not continue to improve as expected since routine services at the basic health centers have been negatively impacted with shortages in supplies.

Maternal Health

Although better than the Sub-Saharan African average, maternal mortality is not decreasing in Madagascar. Although Madagascar is performing better than the sub-Saharan African average of 645 per 100,000 live births (Figure 2.7), in fact the maternal mortality rate remained stable over the last decade and in 2008/09 was estimated at 498.¹⁵ However, neonatal mortality, which is affected by maternal health interventions, overall decreased from 34 in 2003/04 to 24 in 2008/09 per 1,000 live births; however, it increased in urban areas from 22 per 1,000 live births to 26, while it decreased in rural Madagascar from 37 per 1,000 live births to 24.

There are multiple reasons for this stagnation including lack of access to assisted deliveries, poor post-natal care at the basic health center level, and inadequate referral system to the hospital level. This stagnation is in part attributable to inadequate access to skilled staff at delivery, poor quality of antenatal care, lack of emergency obstetric care services, sub-standard quality of care, inadequate post-natal follow-up, lack of confidence and belief in the importance and use of health services, and persistently high unmet need of contraception. Achieving universal access to reproductive health services is challenging and while access to antenatal care was estimated at 86 percent in 2008/09, only 49 percent of women had the four antenatal care visits recommended by the World Health Organization (WHO), and the quality of care varied across geographical regions and income groups, with the urban rich population benefitting the most. Given that 65 percent of women do not give birth in a health center and the rate of assisted deliveries decreased from 51 percent to 44 percent in the past five years,¹⁶ post-natal care interven-



Source: World Development Indicators 2010, World Bank.

tions are all the more critical for the health of the newborn and the mother. However, 35 percent of women who gave birth outside of a health center did not receive any medical follow-up. An overview of maternal mortality related issues is presented in Box 2.1.

Malagasy women face persistently high unmet need of contraception and abortion rates are very high, posing an unnecessary fatal risk to women. The CPR of 29 percent is increasing; yet unmet need continues to be very high and 15 percent married women desiring to space (8.4 percent) or limit (6.2 percent) births are unable to access family planning services.¹⁷ This situation is of particular concern since abortion rates are estimated at 1 per 10 live births, and abortion complications are a major contributor to maternal deaths.¹⁸ Furthermore, a third of girls under the age of 19 are mothers, and adolescent pregnancies are particularly at risk for maternal and neonatal mortality.¹⁹

Box 2.1. Maternal mortality in Madagascar

A woman is at risk of mortality throughout the pregnancy period, during child-birth, and immediately after delivery. While there is no in-depth data available in Madagascar to reveal the burden of each period to maternal mortality, the most recent DHS provides an overall picture of utilization of maternal health services that have an impact on maternal mortality.

Making pregnancy safer

The World Health Report 2005 report outlined three most important influences on the outcome of a pregnancy: antenatal care, unwanted pregnancies, and the legal and social framework. Antenatal care provides both the opportunity to reach a woman with important information regarding safe delivery, as well as the necessary pregnancy-related care and monitoring. In Madagascar, these opportunities are largely ignored. While antenatal care coverage is high—86 percent of women who had a child in the preceding five years reported having been to one antenatal care visit at a trained health service provider—only 49 percent were informed about signs of pregnancy complications. This indicates a large missed opportunity to reach women with adequate information related to pregnancy emergencies. Eclampsia (a common hypertensive disorder) is the third leading cause of maternal deaths worldwide; however it can be detected during pregnancy. Although pre-eclampsia is not treatable, adequate monitoring can prevent eclampsia during childbirth. However, only 49 percent of women attended the minimum four antenatal care visits recommended by the WHO, 81 percent had the blood pressure verified, and a mere 30 percent had the urine tested. To diagnose pre-eclampsia, a woman should have the urine checked for protein when she is diagnosed with pregnancy hypertension. Urine testing can be done with a dipstick but there are also methods that can be used in their absence, and therefore such tests can be carried out at any health center.

Another way to improve pregnancy outcomes is to prevent and safely deal with unwanted pregnancies. There is very limited data on abortions in Madagascar; however, there are estimates that suggest that there is one abortion for every ten live births. Worldwide abortions account for 13 percent of maternal deaths, being the fifth-leading cause of maternal mortality, while estimates for Madagascar give it a much higher mortality burden. Adequate family planning offer can in fact prevent much of these unnecessary deaths, but 19 percent of women who desire to space or limit births do not have access to family planning methods. Finally, the social and judicial framework can influence the outcome of a pregnancy. In Madagascar, 12 percent of married women are not at all involved in decisions regarding their health, and an additional 48 percent must take these decisions jointly with their husband. An alarming 9 percent of women and 8 percent of men believe it justifiable that a husband beats up his wife if she refuses sexual relations. In terms of legal provisions, Malagasy women lack access to safe abortions and if deciding to terminate the pregnancy attempt an unsafe abortion, risking their lives and health.

(Box continues on next page)

Box 2.1 (continued)**Preventing mortality from childbirth complications**

The top four causes of maternal deaths worldwide occur during childbirth (hemorrhage, infections, eclampsia, and obstructed labor). Although Madagascar lacks an adequate referral and emergency system, many complications can be prevented at the basic health center. However, only 35 percent of women who had a child in the five years preceding the survey delivered at a health center. Skilled professional care during and after childbirth can also significantly influence the health outcome of the mother, but only 44 percent of women were assisted by a trained medical provider. Finally, the 48 hours after delivery are crucial for the health of the mother and the newborn, however only 46 percent of women had a postnatal exam during this critical period and 35 percent did not have any post-natal exam at all.

Sources: Data are from DHS 2008/09, whereas world statistics are from *The World Health Report 2005, Make Every Mother and Child Count*.

Nutritional Status of Children and Women

Madagascar remains one of the countries in Africa with persistently high rates of chronic malnutrition. Although a lot of progress has been made in decreasing child mortality, stunting, growth retardation secondary to chronic malnutrition, affects almost half of Malagasy children under the age of five (46.3 percent) and half of these are severely stunted.^{20,21} By the age of 24-35 months, an age after which stunting is difficult to reverse, more than half of children in Madagascar are nutritionally at risk. Malnutrition affects children across income groups: 48 percent of the poorest children are stunted versus 44 of the richest ones.²²

Table 2.3. Trends in malnutrition rates for children under five,²³ 1997-2009

	1997/98		2003/04		2008/09 ²⁴	2003-2008
	EA ²⁵	DHS	EA	DHS	DHS	Sub-Saharan Africa
	Apr-June	Sept-Dec	Apr-July	Nov-Mar	Nov-Aug	
Moderate Stunting (height-for-age)	47	48.3	47.5	47.7	50.1	42*
Moderate Wasting (weight-for-height)	8.3	7.4	5.4	12.8	n/a	10*
Moderate Underweight (weight-for-age)	42.7	40	34.3	41.9	n/a	15

Source: UNICEF (2009). *The State of the World's Children*. New York: UNICEF.

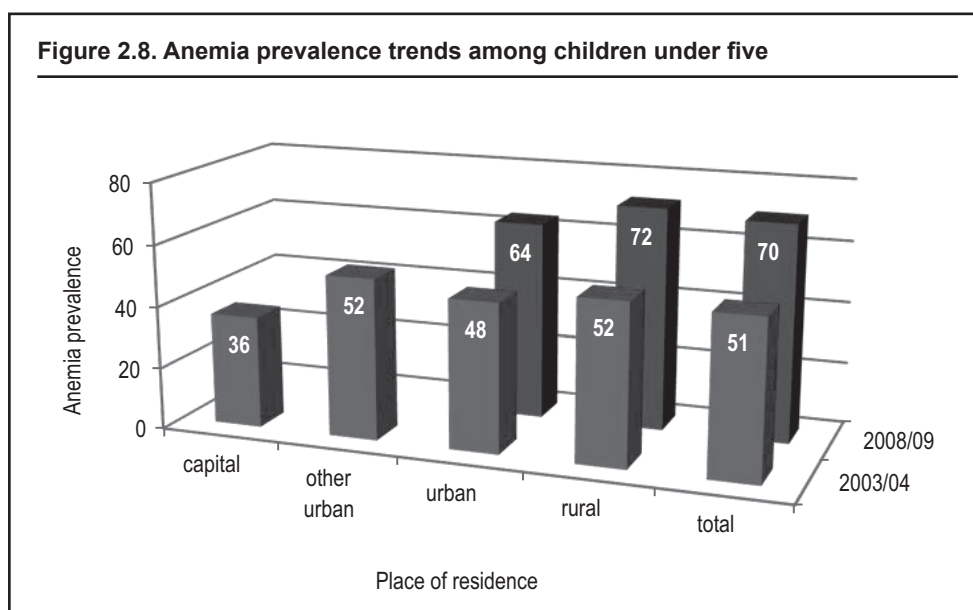
*Statistics for Sub-Saharan Africa for stunting and wasting represent moderate and severe cases.

There has been improvement in moderate underweight incidence but none in the incidence of stunting. Over the past ten years, Madagascar experienced an overall improvement in the prevalence of underweight, but virtually no change was observed in the prevalence of stunting, an indicator of long-term nutritional deprivation. Table 2.3 describes the time evolution of nutritional status in Madagascar using comparable nationally representative anthropometric surveys (*Enquête Anthropométrique—EA*)²⁶ for the period 1997–2004. However, any progress achieved still places Madagascar far from the MDG objective of 28 percent moderately underweight by 2015, and very far from the Sub-Saharan Africa average.

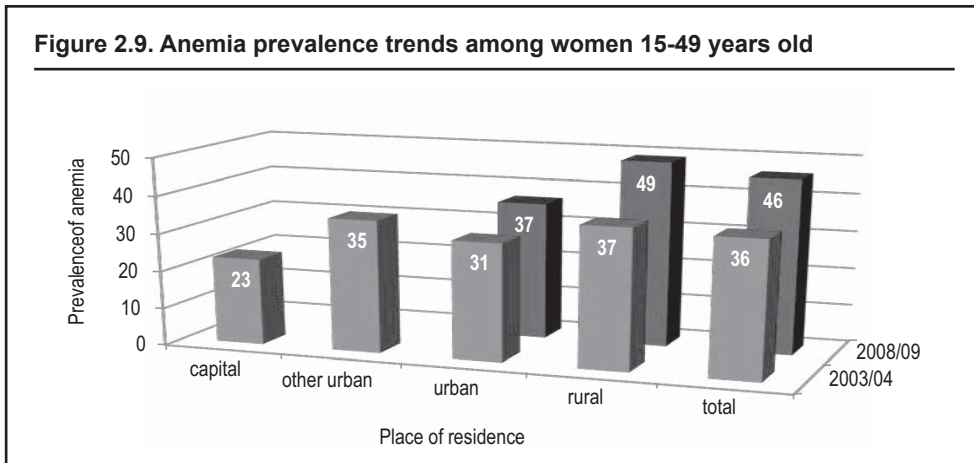
Prevalence of anemia, an underlying cause of chronic ill health, is very high among children in Madagascar. One in two children between 6 and 59 months is anemic, 40 percent of whom are considered moderately anemic. Regional variations are very high, for example in DIANA (Antsiranana province), 7 out of 10 children are anemic, while in Betsiboka (Mahajanga province), anemia prevalence is at 25 percent. These children are put at a higher risk of infection, delayed cognitive development, and reduced physical capacity. Nonetheless, anemia has decreased among children under-five since 2003, when prevalence was alarmingly high at 70 percent (half of which presenting moderate and severe anemia). Accelerated results occurred in rural areas where the prevalence decreased by 20 percentage points during the past five years (Figure 2.8). However, except for the capital, the levels surpass the 40 percent threshold that categorizes anemia as a severe public health problem that requires targeted and aggressive interventions,²⁷ but the results are comparable to the continent's average of 67.6 percent.²⁸

A third of Malagasy women are anemic, however, anemia prevalence is decreasing, especially in rural areas. In Madagascar, more than one in three women (15 to 49 years old) are anemic (36 percent), however, few of them are moderately and severely anemic (overall 6 percent and under 1 percent respectively). Among pregnant women, 35 percent suffer from anemia, mostly from a mild form.

Moreover, Figure 2.9 shows that prevalence of anemia among women is decreasing, especially in rural areas. Furthermore, these results are significantly lower than Africa's estimated average of 57 percent among pregnant women and 48 percent among non-pregnant women.²⁹ Moderate anemia affects pregnant women disproportionately (16 percent of pregnant women are moderately anemic). Anemia among pregnant women impairs fetal development and increases the risk of maternal death during childbirth.³⁰



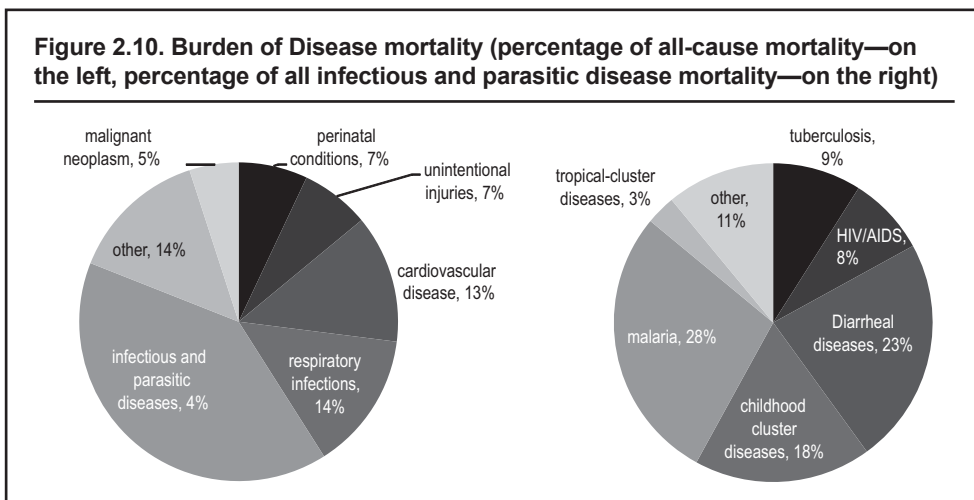
Source: DHS 2003/04 and 2008/09.



Source: DHS 2003/04 and 2008/09.

Other Communicable Diseases Contributing to Mortality and Morbidity in Madagascar

Infectious and parasitic diseases are major contributors to mortality in Madagascar. Because Madagascar's vital registration system only records about 4 percent of all deaths and the country has never carried out a population-based survey of mortality by cause, the distribution of mortality by cause is unknown. Health facility data on in-patient mortality, while biased by incomplete diagnoses and the exclusion of deaths occurring outside the hospital, might be indicative of some of the major causes. Available information from the WHO suggests that about 40 percent of all deaths are attributable to infectious and parasitic diseases, of which most are preventable diseases. Lower respiratory infections (14 percent of all cause mortality), cardiovascular diseases (13 percent), malaria (11 percent), and diarrheal diseases (9 percent) were the estimated top causes of mortality in 2002, as shown in Figure 2.10.



Source: WHO, Department of Measurement and Health Information (2002 estimates).

Madagascar is considered an anomaly to the HIV/AIDS epidemic since prevalence is very low, despite a high prevalence of sexually transmitted infections (STIs), and in particular, syphilis prevalence,³¹ and relatively high rates of sexual partner change in most of the country.

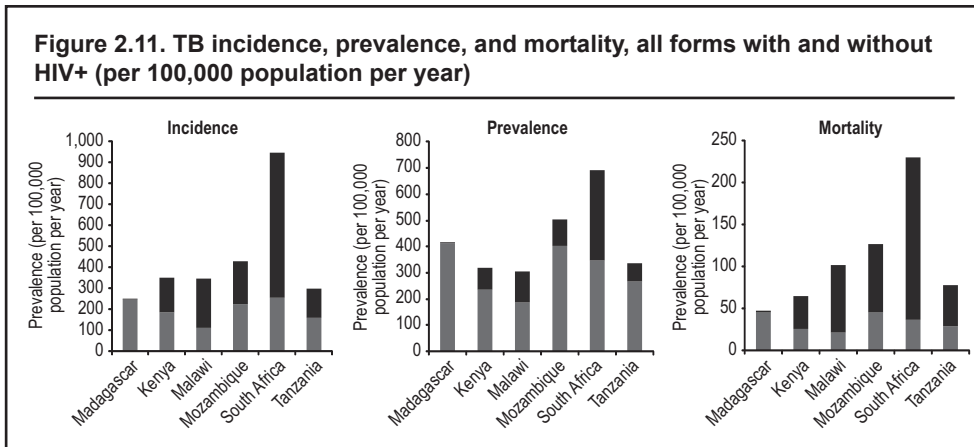
Prevalence of HIV is estimated under one percent nationally,³² and epidemiological surveys confirm that it is spreading at a slow rate in Madagascar. Surveillance data from 2007 shows that HIV is prevalent among pregnant women in both urban (0.19 percent) and rural (0.26 percent) settings across the country. There were no significant differences across age groups, education level, or matrimonial status. However, it is interesting to note that none of the pregnant women under 15 or over 44 were identified to be HIV+. For the ten identified cases, there were no significant differences in age, matrimonial status, and education level. A similar survey among sex workers was carried out in seven sites and only three reported HIV+ individuals.³³ Again, there was no significant difference across age groups, matrimonial status, and education level. Between 2005 and 2007, HIV prevalence has decreased across the high risk groups, and remained significantly unchanged among pregnant women.³⁴ Furthermore, these studies show that the molecular epidemiology of HIV on the island appears to be very different from that in other African and Asian countries where one specific subtype dominates. No specific subtypes dominate at the regional level or in population sub-groups. The diversity of viral subgroups in the absence of a predominant one suggests that HIV is only spreading at a slow rate. In contrast, the emergence of dominant subtypes would signal a new phase of more active and speedy diffusion.³⁵

STI rates are extremely high in Madagascar, especially in certain most at risk groups. Underscoring this is data from a sample of households surveyed for the 2003/04 DHS, which revealed a syphilis prevalence of 6.3 percent among adults aged 15-49. However, syphilis rates are at 8.2 percent³⁶ among pregnant women, but with wide regional differences, 16.8 percent in Toamasina while 3.6 percent in Antananarivo. These rates are among the highest in Africa.³⁷ The main contributing factors are unfavorable sexual practices, which continue to be an important risk, as illustrated by age at first sexual relation, high numbers of concurrent sexual partners and low levels of condom use, as well as lack of awareness that STIs are a serious health problem.

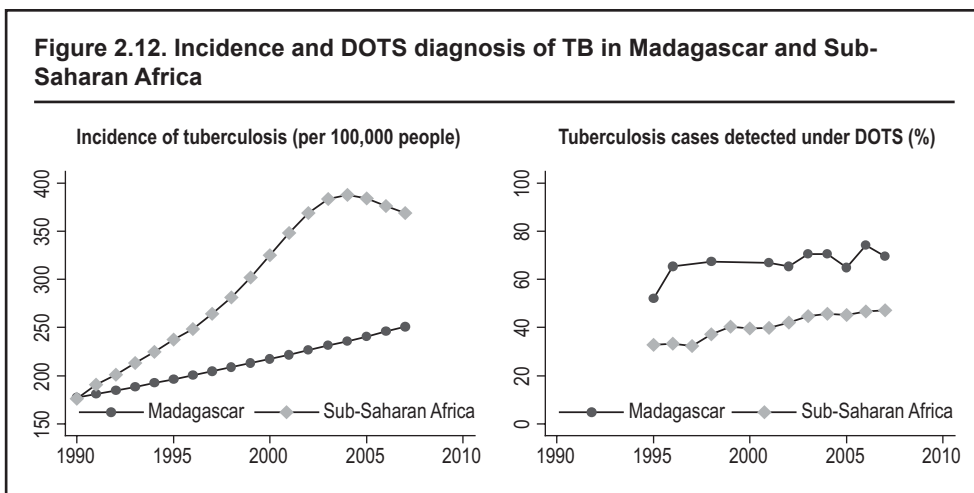
Tuberculosis (TB) incidence and mortality in Madagascar is significantly lower than in most neighboring countries where the HIV/AIDS epidemic has increased the number of new TB cases, but the prevalence rate is comparable to the other countries in the region, as demonstrated by Figure 2.11.

But prevalence and incidence of TB in Madagascar are on the increase compared to a decreasing Sub-Saharan trend. The prevalence rate (per 100,000 population) increased from 359 to 417 by 2007, and the incidence rate (per 100,000 population) reached 251 from 217. This is in contrast with the Sub-Saharan trend which has followed a downward path since 2005 (Figure 2.12).

Increased TB incidence may be due to worsening poverty on one hand and increased numbers of cases being detected on the other. There are a couple of intertwining explanations for these findings. The sustained increase in TB incidence, which is the rate of new cases being identified, can be attributed to worsening poverty in Madagascar as well as to implementation of a more successful TB program which has translated into more cases being detected. Conversely, over the last five years, Sub-Saharan Africa expe-



Source: WHO Global TB Database, 2009; data for 2007.



Source: Global TB database WHO 2009.

rienced an increase in anti-retroviral treatment coverage, therefore reducing the number of HIV patients who are susceptible to TB infections. In Madagascar, despite these increases in incidence and prevalence, the mortality rate estimated at 48 deaths per 100,000 has only slightly oscillated during the same period.³⁸

Madagascar is one of the top five African countries heavily affected by plague, which is endemic in two urban centers. Although its incidence in the country is small relative to other diseases, plague has a symbolic importance because of its high case-fatality ratio (30 percent to 60 percent if left untreated), its association with poverty, and the public's abhorrence of its vectors, namely the infected rat and flea. Moreover, given the very low level of sanitation (53 percent of households do not have access to garbage disposal, and more than 48 percent have no latrines³⁹), the disease may be prone to outbreaks, particularly in impoverished districts. While outbreaks through flea transmission can be controlled with relatively simple measures, human-to-human outbreaks through pulmonary transmission are much more deadly and more difficult to control.

Plague is endemic in two urban centers, in Antananarivo and Majunga (the second largest city). In 2008, plague caused 33 deaths among confirmed cases (71 deaths among suspected cases) in Antananarivo, Majunga, and in 34 other districts. A downward trend for reported cases has been observed since 1997, with two peaks in 2004 and 2007/2008.⁴⁰ The Pasteur Institute has developed a specific rapid field test allowing prompt confirmation of the diagnosis and therefore, better compliance with the treatment, essential for reducing complications and fatality. The relatively constant annual number of deaths per confirmed cases illustrates the limits of a purely clinical care approach and the need to improve sanitation.

Bilharzias affects a third of the population and more than 80 percent of the country is at risk. Bilharzias, one of the neglected tropic diseases, affects about five million people, a third of the population, and 15 million people, more than 80 percent of the country, are at risk in 95 out of the 111 districts. Both intestinal and urinary bilharzias are widely prevalent at various endemic levels nationwide.⁴¹ Elimination is a difficult task since it involves eliminating the habitat of the vector, the water-dwelling snail, or the contact opportunities between humans and snails, which is impossible to accomplish in the current context. Therefore, the principal objective of the bilharzias program is to reduce the morbidity through mass treatments in hyper-endemic areas. The available treatment with praziquantel can be successful in treating the disease if administered orally once every few years (1-3), however, it does not protect against new contamination, and to be effective, such mass treatments must be repeated every two to three years. A major scale-up in mass campaigns occurred between June and October 2008 when more than one million school-aged children (82 percent of the target population) were treated through a donation of 3.4 million praziquantel tablets by Merck KGaA.⁴²

Cases of influenza caused by AH1N1 have been confirmed and treated. As of April 2010, 1,013 cases of the AH1N1 have been confirmed in Madagascar, out of which three resulted in death. All cases were treated at domicile, free-of-charge, by the MoH and the Pasteur Institute of Madagascar. The situation has improved considerably since January 2010, and no cases have come to light since March 23, 2010. The Government has been working closely with UN agencies and technical partners. A National Contingency Plan and UN Contingency plan are in place to address AH1N1, and each possible case is being closely monitored by the health authorities.

After India and Brazil, Madagascar has the highest prevalence of leprosy in the world with 1,521 cases reported in 2007.⁴³ Fianarantsoa and Toliary are the two most affected provinces mainly due to: (i) a high level of poverty; (ii) poor health facility coverage; and (iii) the prevalence of other skin problems resembling leprosy lesions.⁴⁴ The objective is to reduce leprosy prevalence to less than 1/10,000. With diagnosis and treatment mostly financed by the Raoul Follereau Foundation, treatment with Poly-chemotherapy has been used since 1992.⁴⁵

Among the vector-borne diseases, **filariasis, cysticercosis, favus, and tungiasis represent an important health burden for the population.**

Non-Communicable Diseases

Hypertension is on the rise in Madagascar. Cases of hypertension diagnosed in health facilities increased by 160 percent between 1999 and 2004,⁴⁶ and in 2005, according to a

national survey on risk factors related to chronic non-communicable diseases, 17.6 percent of the population suffered from hypertension.

The annual number of cancers diagnosed in the public health system varied between 439 and 1206 in 2003, which most likely considerably underestimates the actual number of people diagnosed with cancer countrywide.

Oral health is a major burden of disease for the population; 85 percent of the children aged six years have dental cavities, while among adults (35-44 years old), the figure reaches 98 percent. Access to oral health is very limited because of the cost and 90 percent of the population has no access to dental health services. There are 410 dentists throughout the whole country. However, one public health intervention⁴⁷ piloted under a World Bank project (although not yet evaluated) was to improve the salt-making, iodization and fluoridation process in Madagascar in order to reduce cavities.

A national survey in 2003 estimated that 7.5 percent of the population is disabled,⁴⁸ with congenital deficiencies accounting for 17 percent. Among the acquired deficiencies, the largest share (67 percent) is related to disease-related disabilities while trauma and traffic accidents represent about 14 percent.

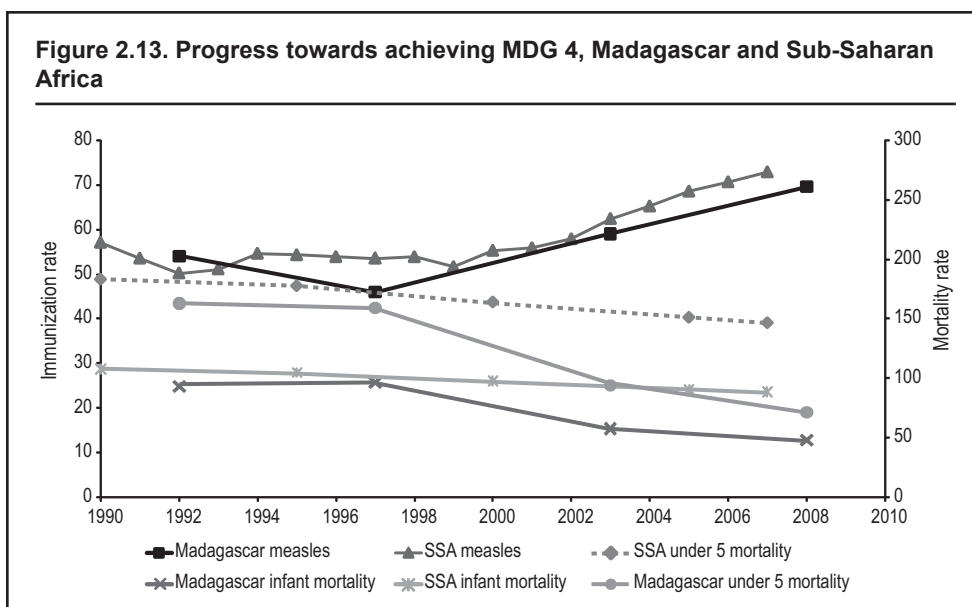
Meeting the Millennium Development Goals (MDGs)

Prior to the 2009 political crisis, Madagascar seemed likely to achieve the fourth MDG related to child health and was on track to meeting the sixth MDG related to communicable diseases, with respect to HIV/AIDS and malaria, although increased efforts are needed for the fight against TB. Despite progress on child mortality, it is unlikely that hunger will be eradicated and indicators show that Madagascar is not on track to achieve the first MDG. Finally, the stagnation of maternal mortality in the past 10 years will prevent the country from achieving the fifth MDG. In 2008, Madagascar seemed to be on track for achieving its health-related MDG objectives for child mortality and transmissible diseases, and was performing better than the Sub-Saharan Africa average. However, the impact of the 2009 political crisis on the sector is as yet unknown; as such, the country is in danger of backsliding and gains in the sector are being jeopardized.

There has been positive progress towards the fourth MDG. Child mortality has halved in the last ten years and the immunization rate (percentage of children 12-23 months fully immunized) has doubled. It is interesting to note that despite no major gains in GDP per capita, Madagascar's declining trends for infant and child mortality rates are more accelerated than the overall trend for Sub-Saharan countries. At the time of agreement on MDGs, Madagascar was performing worse than the average in Sub-Saharan Africa for measles vaccination. However, since 1997, vaccination efforts have shown improved results and Madagascar almost reached the Sub-Saharan average by 2008⁴⁹ (Figure 2.13).

Despite a decrease in mortality, children under five continue to have a high morbidity risk, and suffer from poor nutritional status; thus, concerted efforts are required to address other key causes of child deaths including diarrhea, malaria, acute respiratory illnesses (most notably in rural areas) and vaccination coverage for epidemic-prone diseases.

The nutritional situation of Malagasy children has not improved and therefore no progress has been made towards achieving the first MDG. Although no data is available in the 2008/09 DHS to estimate the prevalence of underweight children under



Source: SSA data from WDI 2009, while Madagascar data from DHS 1992, 1997, 2003/04, and 2008/09.

five years of age, data on the core intermediate indicators shows a clear stagnation of nutritional indicators in the country. Vitamin A supplementation for children 6-59 months has decreased in the past five years, breastfeeding practices have remained the same since 1997, and there is no change in low-birth weight incidence rate.⁵⁰ Since no progress has been made on these intermediate indicators, it is unlikely that the first MDG will be met by 2015.

With respect to communicable diseases, the malaria and HIV/AIDS related goals are still achievable notwithstanding the political crisis, although more efforts need to be made on TB. The malaria-related goal is clearly achievable by 2015 as all indicators are favorable if interventions are continued. The prevalence of prevention activities is not wide-spread but improving, and in 2008, almost half the children and pregnant women slept under an insecticide-treated net.⁵¹ Malaria-related mortality has decreased across all groups in the population. The prevalence of HIV/AIDS continues to be very low at below one percent. Both the prevalence rate and the incidence rate of TB have followed an upward trend since 2000. This trend could be reversed if sufficient financing and attention were given to the national program as was prior to the crisis. However, given the reduction in donor financing and resulting gap, it may be difficult to reverse this trend by 2015.

In contrast with the gains in childhood mortality, interventions in maternal health have had little results and maternal mortality rate is stagnating, and it is unlikely that Madagascar will meet this MDG. Neonatal mortality, although decreasing, is not declining (from 34 to 24 per 1,000⁵²) as swiftly as necessary to achieve the target of 17 per 1,000. Maternal mortality, estimated around 498 per 100,000 live births in 2008/09, is almost unchanged over the last decade since 1997 (488 per 100,000), and is far from the MDG target of 149 per 100,000 live births in 2015.

The above analysis highlights the need for aggressive interventions in maternal and neo-natal health areas, specifically to address reproductive health and maternal malnutrition particularly in adolescents and increase the proportion of assisted and facility-based deliveries.

Notes

1. Life expectancy for Eastern Africa is 51, Kenya and Tanzania, 53 and Mozambique, 43 (Population Reference Bureau).
2. GDP per capita (constant 2000 US\$) decreased from US\$247 in 2001 to US\$209 in 2002, and then slowly increased to US\$246 in 2007.
3. The population projection change is on par with Eastern Africa's expected population growth rate of 118 percent over the same period.
4. Population Reference Bureau. (2009). *World Population Data Sheet*.
5. 22 percent of Eastern Africa's population is urban, and 6 percent lives in urban areas larger than 750,000 (PRB).
6. May, J. (2006). *Dimension Population et Lutte contre la Pauvrete a Madagascar*. Aide Memoire, WB.
7. Mortality rates are ten year rates for urban/rural and five year rates for total, per 1,000 live births; the TFR indicates average number of children per woman represented by the synthetic fertility rate; the CPR is the percentage of sexually active women who use a modern method of contraception.
8. Latest available between 2005-2007 from World Development Indicators database.
9. 'Richest' and 'poorest' in this chapter refer to the households in the top and bottom wealth quintiles of the population.
10. Including the University Hospital and the Regional Reference Hospitals.
11. For children under five, the absolute number of deaths attributed to malaria (probable and confirmed) decreased from 302 to 102 between 2004 and 2008, while the proportion in all-cause mortality decreased from 28.5 percent to 17.7 percent. For those over five years of age, the absolute number of deaths attributed to malaria (probable and confirmed) decreased from 413 to 174, while the proportion in all-cause mortality decreased from 13.4 percent to 7.7 percent.
12. Data is from the Malaria National Level Report, *Service de Lutte contre le Paludisme*, 2009.
13. UNICEF, Roll Back Malaria, and The Global Fund. (2009). *Malaria and Children: Progress in intervention coverage*. New York: UNICEF.
14. There was a 48 percent drop in adult outpatient visits with confirmed malaria. A similar drop was recorded among children under five.
15. Although the estimate has increased between 2003/04 and 2008/09 from 469 to 498, statistically no change can be concluded since the two 95 percent confidence intervals overlap.
16. 2008/09 DHS.
17. 2008/09 DHS.
18. Gastineau, B., & Razafiarison, J. C. (2005, March). L'avortement à Madagascar. *Bulletin d'Information sur la Population de Madagascar*, pp. 1-3.
19. 31.7 percent of girls 19 years old and younger already had a child or are pregnant; 57 percent of 19 year-olds, 50 percent of 18 year-olds, 29 percent of 17 year-olds, and alarmingly 17 percent of 16 year-olds (source: DHS 2008/09)
20. The proportion of stunted children in Madagascar is the highest in Africa, and only surpassed by Afghanistan and Yemen in the world.
21. Stunting is indicated by height-for-age <-2 Z-score of NCHS standards, wasting by weight-for-height <-2 Z-score of NCHS standards, and underweight by weight-for-age <-2 Z-score of NCHS standards. Severe forms of malnutrition is indicated by <-3 Z score of NCHS standards.
22. 2008/09 DHS.
23. Moderate stunting is indicated by z-score H/A <-2SD, moderate wasting by z-score W/H <-2SD, and moderate underweight by z-score W/A <-2SD.
24. 2008/09 DHS results are based on the comparison with the results from the WHO Multicenter Growth Reference Study Group, 2006, and therefore may not be directly comparable to earlier

studies which were based on the references of the NCHS/CDC. Also, no results are available for wasting and underweight from the 2008/09 survey.

25. The 1997 survey covers 108/111 districts. The districts comprising the capital (Antananarivo) and two other districts (Kandreho and Benenitra) not surveyed during the 1997 were subsequently added in 2004, to achieve national coverage.

26. The EA 1997 & 2004 were administered to a nationally representative sample from April to July, overlapping with the harvest season. The DHS were collected in different periods of the year (September to December 1997 following the harvest season, and November 2003-March 2004 in the lean season). As such, indicators of short-term nutritional status are not comparable over time by using the DHS.

27. According to World Bank analysis, a severe public health problem exists when anemia prevalence is greater than 40 percent in any group; it is considered moderate when the prevalence is between 20 percent and 39 percent. (Source: Health Nutrition and Population.(2004). *At a Glance: Anemia*. World Bank Group.)

28. WHO Global Database on Anemia. (2008). *Worldwide prevalence of anaemia 1993-2005*. Geneva: World Health Organization.

29. WHO Global Database on Anemia. (2008). *Worldwide prevalence of anaemia 1993-2005*. Geneva: World Health Organization.

30. Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, Mathers C, Rivera J for the Mather and Child Under-nutrition Study Group (2008) Maternal and Child under-nutrition: global and regional exposures and health consequences, *Lancet*: 371: 243-60.

31. 4.5 percent among pregnant women in 2007.

32. *Secrétariat Exécutif du Comité National de Lutte contre le SIDA (SE/CLNS), 2006.*

33. Majunga 2.1 percent/7 cases; Tulear 1.2 percent/4 cases; and Taolagnaro 0.3 percent/1 case.

34. The molecular epidemiology of HIV in Madagascar appears to be very different from that in other African and Asian countries where one specific subtype dominates. No specific subtypes dominate at the regional level or in population sub-groups. The diversity of viral subgroups in the absence of a predominant one suggests that HIV is only spreading at a slow rate. In contrast, the emergence of dominant subtype would signal a new phase of more active and speedy diffusion. *Analyse du profil épidémiologique et des déterminants de l'infection au VIH*, September 2008.

35. *Analyse du profil épidémiologique et des déterminants de l'infection au VIH*, September 2008. Direction Générale de la Lutte contre le SIDA and Direction de la Surveillance Epidémiologique des IST et du VIH/SIDA. (2003). *Etude Combinée des Séroprévalences de l'infection à VIH et de la Syphilis chez les Femmes Enceintes*. Ministère de la Santé.

36. Direction Générale de la Lutte contre le SIDA and Direction de la Surveillance Epidémiologique des IST et du VIH/SIDA. (2003). *Etude Combinée des Séroprévalences de l'infection à VIH et de la Syphilis chez les Femmes Enceintes*. Ministère de la Santé.

37. In the 1990's syphilis prevalence rates (%) among pregnant women varied from 2.5 in Burkina Faso, 6.7 in Central African Republic, 8.4 in South Africa, and 17.4 in Cameroon. Source: World Health Organization. (2001). *Global Prevalence and Incidence of Selected Curable Sexually Transmitted Infections. Overview and Estimates*. Geneva: World Health Organization.

38. Global TB database, WHO 2009.

39. DHS 2003/04.

40. See Appendix 1 for trends in plague indicators.

41. Intestinal form is endemic in the southern and eastern parts, while the urinary form is endemic in the northern and western regions. National prevalence rate is at 31 percent, while in some areas the prevalence is as high as 70 percent. WHO, November 2008. Action against Worms. Geneva, Switzerland.

42. Only a total of 110,000 people have been treated between 1999-2006.

43. World Health Statistics Report 2007.

44. Up to 40 percent diagnosis errors with other dermatosis in certain districts.

45. 12 months PCT for multi-bacillar patients, 6 months PCT for the others.

46. *Annuaire Statistiques du Secteur Sante*, 1999 and 2004.

47. A feasibility study was carried out in 2004 and the results published in COPOLLA Pierre, Ap-

pui à la mise en place des coopératives sauniers de Toliara dans le Développement de leur Métier, Sept. 2003; MACQUET Frédéric, ONG TRANSMAD Etat des lieux dans le cadre de a mise en place d'un système de production de sel de qualité iodé et fluoré à Toliara, Février 2004.

48. It is estimated that 10 percent of the world's population lives with disabilities.

49. World Development Indicators, 2009.

50. Percentage of children 6-59 months who received one dose of vitamin A in the past six months decreased from 77 percent to 72 percent between 2003/04 and 2008/09; Proportion of infants under six months who are exclusively breastfed increased only slightly from 48 percent to 51 percent between 1997 and 2008/09; and Low birth weight incidence rate remained at 13 percent between 2003/04 and 2008/09.

51. 45.8 percent of children under 5 and 46.2 percent of pregnant women slept under an insecticide-treated bed net, while 49.5 percent of children and 50.3 percent of pregnant women slept under a bed net overall (2008-2009 DHS preliminary data).

52. DHS 2003/04 and 2008/09.

Behaviors Conducive to Better Health Outcomes

The previous chapter provided a review of the most important health and population outcome indicators in Madagascar. This chapter will provide an analysis of the determinants of these indicators and link access to health services and household/individual behaviors to the previously described health outcomes.

Behaviors and Interventions Affecting Child Health

Improvements in household/individual behaviors affecting child health are very mixed in Madagascar, highlighting certain missed opportunities in interventions. Vaccination coverage has improved while vitamin A coverage has decreased although vitamin A and routine immunizations are administered during Mother and Child Health Weeks. Knowledge of home-based prevention and treatment activities is also mixed and fewer mothers than five years ago know about oral rehydration treatment for diarrhea. This decline can be attributed to a change in questionnaire between the last two surveys; however it can also result from a decrease in awareness raising activities related to diarrhea treatment in favor of other programs affecting preventable diseases.¹

Breastfeeding

Fewer children are exclusively breastfed during the first six months of life; however, the situation is better than in other countries in the region. Most Malagasy women breastfeed their infants; however, exclusive breastfeeding for children younger than six months² stood at only 51 percent in 2008. Although exclusive breastfeeding in Madagascar is more widespread than in other Eastern and Southern African countries (average 42 percent³), there has been no significant progress in the past ten years (48 percent in 1997). However, the median duration of exclusive breastfeeding doubled between 1997 and 2008 from 1.8 months to 3.7 months. Given the very poor nutritional status of pregnant women in Madagascar, which in turn leads to low birth weight and poor nutritional status of infants, exclusive breastfeeding is an important behavioral change intervention that could have a positive effect on this intergenerational cycle of malnutrition.

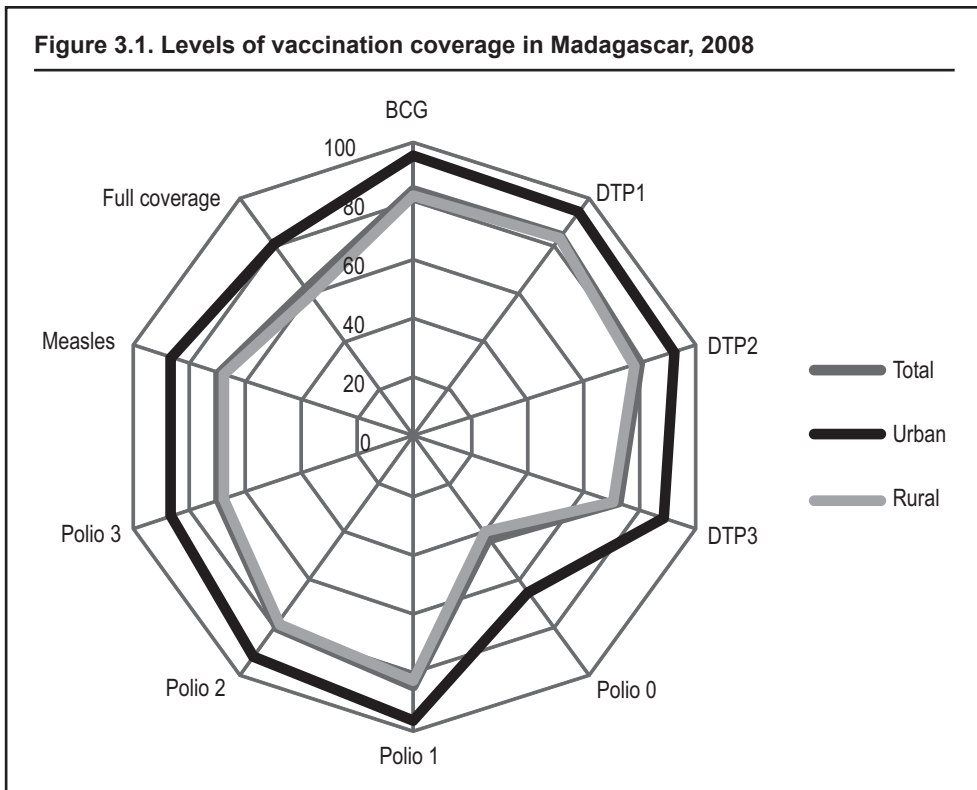
Immunization

Immunization coverage has improved in Madagascar. Complete immunization coverage for children 12 to 23 months old in 2008 was 62 percent. According to the WHO guidelines, children are considered fully vaccinated if by the age of 12 months, they have received the following vaccinations: measles, BCG (tuberculosis), three doses of

diphtheria, pertussis, and tetanus (DPT), and three doses of polio (excluding the one given at birth).

The rates for the first polio and DPT are high (84 percent) and on par with the Sub-Saharan coverage (74 percent and 85 percent, respectively⁴); but some children are not brought in for subsequent immunization doses and thus, the third doses coverage rates for polio and DPT are only 70 percent and 73 percent respectively (Figure 3.1). Vaccination coverage of measles, complications of which are one of the leading causes of deaths of children world-wide, remain the lowest out of all childhood vaccination coverage at 70 percent (an increase from 2003 levels of 60 percent), and lower than the Sub-Saharan Africa average of 73 percent.⁵ Measles complications can be mitigated through adequate nutritional intake; however, almost half of children under five in Madagascar suffer from malnutrition.

There are large differences in immunization coverage across regions, place of residence, and income groups. Detailed analysis of immunization rates indicate a sharp decrease in percentage of children (12-23 months) completely immunized in Antananarivo from 83 percent to 72 percent, while immunization coverage in other cities and in rural Madagascar has substantially increased from, respectively, 67 percent to 86 percent and from 49 percent to 59 percent. Regionally, Androy and Atsimo Antsinanana have the lowest vaccination coverage (30 percent and 31 percent), while Itasy has the highest (84 percent). The urban-rural difference is striking with 81 percent coverage compared to 59 percent. The largest differences are based on education status: only 39 percent of



Source: DHS 2008/09.

children of uneducated mothers were fully vaccinated, compared to 65 percent for those mothers who have completed their primary education and 80 percent for those who have secondary or higher education.

Micronutrient supplementation

Vitamin A supplementation coverage remains relatively high and equal between urban and rural settings. The WHO recommends provision of Vitamin A supplements every four to six months for children 9 to 59 months. Vitamin A is important for proper functioning of the immune system, growth, and development and is associated with a decrease in all-cause mortality in children. National coverage of children 6 to 59 months for the six months prior to the survey was estimated at 72 percent, a decrease from 77 percent in 2003; however, Madagascar is performing better than other Sub-Saharan countries (average coverage was 67 percent in 2007⁶). It is interesting to note that while vaccination coverage improved in Madagascar, vitamin A coverage decreased although Vitamin A is administered as part of the routine immunization services, and during the bi-annual Mother and Child Health Weeks.

Geographical coverage of vitamin A varies significantly; the lowest coverage was in Androy region (51 percent), while the highest is in Itasy region (84 percent). However, urban-rural differences were small (77 percent in the capital, 79 percent in other urban settings, and 72 percent in the countryside). Large differences exist relative to the education level of the mother (60 percent for no-education, 75 percent for primary, and 82 percent for secondary and higher).

The prevalence of adequate iodine content in salt is uneven among Malagasy households. Only half of households that had their salt tested during the DHS 2008/09 had adequate levels (15+ ppm) of iodine, and 29 percent had no iodine in salt. A further six percent of households had no salt at the time of the survey. In some regions,⁷ more than 8 out of 10 households had adequate levels of iodine in salt, however, in five regions,⁸ less than 1 out of 10 households had adequate levels of iodine in their salt. Iodine supplementation of salt is important in Madagascar since a 1995 survey of seven sentinel sites, revealed a goiter prevalence of 23 percent among children 6 to 12 years.⁹ Iodine deficiencies in pregnant and lactating women and children under two years old may jeopardize brain development of the fetus and the child.

Iron deficiency is high among Malagasy children; however, it decreased in the previous five years. In 2003, 70 percent of children were suffering from anemia, mostly from mild (10.0-10.9 g/dl) and moderate (7.0-9.9 g/dl) forms, while in 2008, this proportion decreased to 51 percent (30 percent from a mild form, and 19 percent from moderate anemia). Nonetheless, anemia remains a public health problem, and in some regions anemia prevalence is still alarmingly high (70 percent in DIANA region). Despite such high anemia prevalence, only 4 percent of children 6-59 months received the recommended iron supplementation in the week preceding the survey.

Treatment of acute respiratory infections

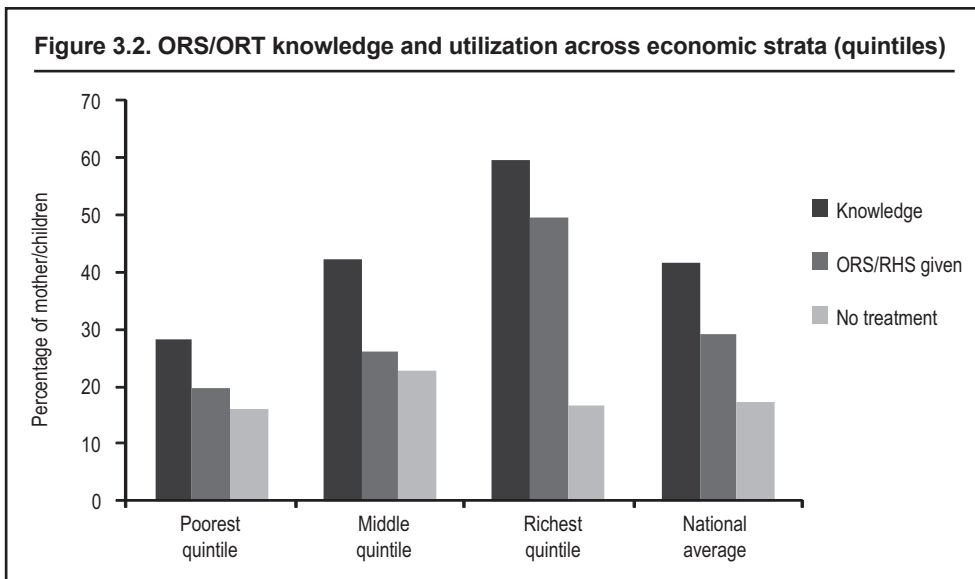
Fewer mothers than five years ago sought treatment when children show symptoms of acute respiratory infections (ARI). Only 42 percent of children under-five with a cough and breathing difficulties were brought to a health center in 2008, as compared to 48 percent in 2003. However, this indicator is higher than the Sub-Saharan average of 40 percent. Furthermore, the burden of morbidity decreased in the past five years: for the two

weeks preceding the survey, 9 percent of children were suffering from ARI symptoms in 2003, and 3 percent in 2008. There are also wide social and geographic differences in seeking care: 27 percent of children whose mothers are uneducated were brought to a medical professional (decreasing from 37 percent in 2003), 40 percent for mothers with primary education (decreasing from 47 percent in 2003), and 66 percent for mothers with secondary and higher education (decreasing from 71 percent).

Diarrhea prevention and treatment

The prevalence of diarrhea is low and decreasing, however, there are wide geographical variations. The diarrhea prevalence rate during the two weeks preceding the DHS interviewer's visit decreased from 18 percent in 2003/04 to 8 percent in 2008/09, mostly among 6-23 months (15 percent of whom had a diarrhea episode in the two weeks prior to the survey). This difference resulted partly from the timing of the two surveys although both surveys were conducted during the rainy season. More children had a diarrhea episode in urban areas (12 percent) than in rural areas (8 percent), the situation being worse in the capital (16 percent). There were wide geographical differences, with prevalence the highest in coastal regions of Boeny, Androy, Betsiboka, Menabe, Analanjirofo, and Antsinana and in two in-land regions of Haute Matsiatra, and Betsiboka, where diarrhea prevalence exceeded 10 percent.

Knowledge and utilization of oral rehydration treatment is very low and varies across geographical regions. Morbidity and mortality resulting from diarrhea can be greatly reduced by treatment with Oral Rehydration Treatment/Salts or ORS/ORT (a simple salt and sugar solution dissolved in water), which replaces the fluids and electrolytes lost and slows dehydration. However, analysis of the 2008/09 DHS data indicates that this basic treatment is not known by most of the poor in Madagascar (Figure 3.2). Furthermore, in the region of Androy, which has one of the highest prevalence rates of



Source: DHS 2008/09.

Notes: Knowledge—percentage of women; ORS/RHS given and no treatment—percentage of children under five who had a diarrhea episode in the two weeks preceding the survey.

diarrhea, knowledge of ORS/ORT among mothers is the lowest in the country (8.5 percent of women). Only in one region (Haute Matsiatra) that is significantly affected by diarrhea (over 10 percent of children with a diarrhea episode in the two weeks preceding the survey), ORS/ORT knowledge surpassed the national average of 42 percent. Utilization of ORS/ORT or the Recommended Home Solution (RHS) for diarrhea treatment is also very low (29 percent of children who had a diarrhea episode in the two weeks prior to the survey received the treatment). In the regions particularly affected by diarrhea, the proportion of children receiving ORS/ORT was higher (43 percent in Betsiboka, and 26 percent in Haute Matsiatra).

Knowledge about ORT varies, favoring the richest (concentration index = 0.14,¹⁰ 28 percent for the poorest, and 60 percent for the richest), and the most educated (24 percent for non-educated, 41 percent for those who completed primary level, and 61 percent for the secondary and higher).¹¹ Overall, there is also a significant difference in utilization of ORT across economic groups (concentration index = 0.18, 20 percent of the poorest children received the treatment during a diarrhea episode compared to 50 percent among the richest 20 percent).¹²

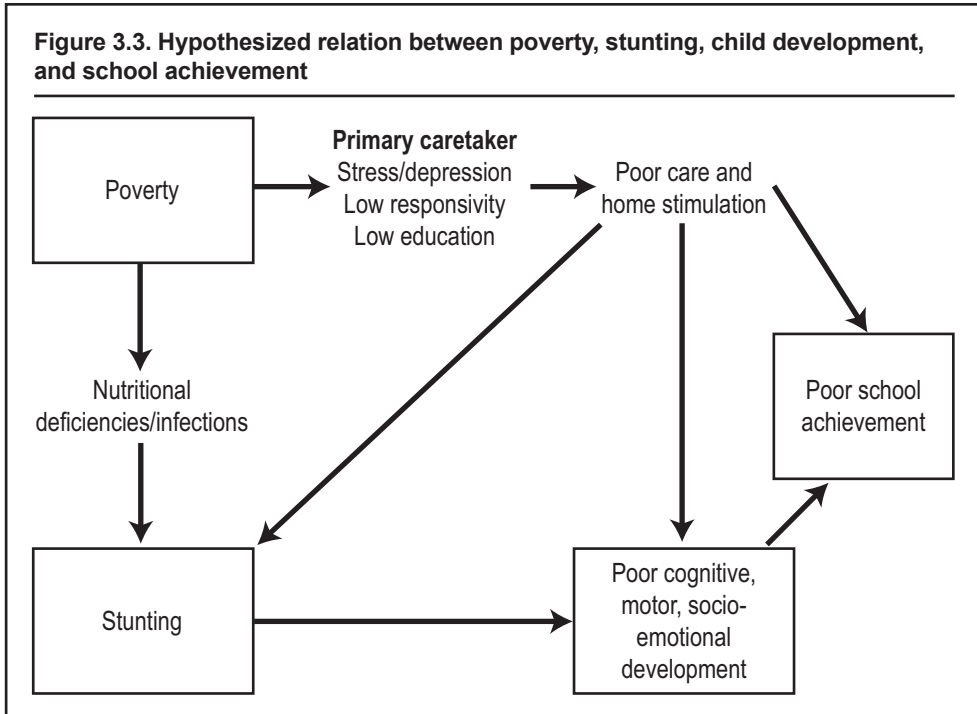
Madagascar was one of the first countries in the world to introduce zinc to complement ORS/RHT as treatment for diarrhea; however, until recently there have been little results. The current WHO/UNICEF recommendation is to treat diarrhea with a 10-14 days course treatment of ORS/RHT to prevent dehydration and zinc to reduce the duration and severity of the diarrhea. In addition, zinc provides protection against any further episodes of diarrhea. In 2007, this new treatment plan was introduced by the MoH in 12 districts. Since 2009, through USAID's program *Point-of-Use Water Disinfection and Zinc Treatment* this policy was strengthened by the introduction of the same treatment course in the formal and informal private sector markets. Prior to this private sector initiative, treatment for diarrhea relied heavily on inappropriate medication such as antibiotics (37 percent), and unspecified pills and syrup (28 percent),¹³ while only 8 percent of children received ORS and less than 1 percent received zinc (55 percent received the recommended home fluid).¹⁴

Community Factors and Behaviors Affecting Nutritional Status of Children

General causes and consequences of child under-nutrition

According to the most recent Lancet series, maternal and child malnutrition are the underlying cause of 3.5 million annual deaths worldwide, and account for 35 percent of the disease burden among children under five.¹⁵ There is a strong consensus that improvements in the nutritional status of infants and young children not only have a direct, short-term impact on their health, but also impact their physical and mental development later in life. Figure 3.3 illustrates this relationship.

The first few years of a child's life (specifically from the age of 9 months to 24 months) are the most important for achieving their developmental potential, physically, as measured through growth faltering,¹⁶ as well as emotionally, socially, and cognitively. From conception to five years of age, a child's brain is developing at a rapid rate. Poverty shapes and defines the environment that a child experiences during these critical years and is inextricably linked to a child's ability to develop fully.



Source: LANCET series on child development 2007.

Deficiencies in basic health and nutrition contribute significantly to delayed physical and cognitive development.^{17,18} Birth weight and height-for-age can be used as proxy measures for nutritional intake during gestation and early childhood, respectively. Significant associations exist between low height-for-age and delayed cognitive development, psychomotor development, and behavior. Grantham-McGregor et al. provide a comprehensive review of the existing literature which consistently indicates a link between under-nutrition and deficits in intelligence and school performance.¹⁹ Previous studies show that malnourished children fail to achieve their genetic potential in physical and cognitive development that negatively reflects on their adult outcomes ranging from social behavior to lower labor productivity.²⁰ Cognitive deficits in early ages are difficult to reverse and if they compound over time, the investments made during school years will be less effective, with significant long-term costs in terms of educational attainment and adult productivity.

Consequences of nutritional status on ECD

Anthropometry outcomes confirm the evidence that the children's growth potential is determined by age three. The WHO Child Growth Standards for children's physical development (height, weight, body-mass-index, head and arm circumference) have proved invaluable for evaluating the need for interventions, as well as setting targets for what children can achieve anywhere in the world, given proper nutrition, family support and health care.²¹ Econometric analysis on Malagasy data²² indicates that stunting before age three is significantly correlated with subsequent poor early childhood development (ECD) outcomes, confirming that nutritional deficiencies are an important channel of children developmental deficits before they reach school age. The strong positive cor-

relation of the anthropometric measures in the first three years of life with the verbal and non-verbal outcomes at ages three to six years corroborates the results found in other studies around the world, and reinforces the importance of early childhood nutrition interventions.

Determinants of malnutrition

A child's characteristics such as age, birth order and gender have a significant effect on being underweight as indicated in the econometric analysis²³ of the 2004 EA. Younger children (age 12 to 24 months) are at a higher risk of being underweight than older ones (age 48 to 60 months). Also, first through third born have a lower incidence of underweight compared to higher order children. Low birth weight (self-reported perception by the mother) is significantly associated with worse nutritional outcomes, in line with the international evidence on the costs of low birth weights.²⁴ Interestingly, boys have worse nutritional status compared to girls, a pattern that seems to be consistent across countries in Sub-Saharan Africa.^{25, 26}

Maternal characteristics are also found to be important predictors of the nutritional status of children. The height of the mother is an important proxy for the genetic and non-genetic (e.g. dietary) factors that affect nutritional outcomes and are not picked up by her socio-economic and demographic characteristics.

Commune characteristics contribute significantly to nutritional outcomes as well. Children living in rural areas have, on average, higher malnutrition rates (4.5 percent points higher) than those living in urban centers. This may be linked to higher food insecurity levels in rural areas.²⁷ Access to safe water, electricity, health infrastructure (immunization center, hospital, basic health facility) and transportation infrastructure (national or provincial road, paved road)²⁸ significantly diminishes the prevalence of underweight children. When communes were ranked according to such an infrastructure index, the difference in underweight prevalence between the top and the bottom quartile was of 11 percentage points in 2004.

Improvement of location-specific determinants would therefore translate into better nutritional status for children. International evidence using household surveys from twelve countries²⁹ suggests that allowing community and household infrastructure to change over time would increase the impact of 2.5 percent of per capita income growth on the incidence of national rates of underweight by about 9 percent. In Madagascar, according to Commune Census data, access to public services and infrastructure conditions improved between 2001 and 2007,³⁰ including availability of safe water and schools. Transportation and accessibility as measured by availability of roads, travel time and cost also show positive trends. Cash crops, which have relatively higher returns, have also grown in relative importance over time. When analyzing the change in prevalence of underweight children between 1997 and 2004,³¹ the availability of safe water (running water in the case of weight-for-age, and protected wells for height-for-age) is the most significant variable to affect this trend, while remoteness comes out as the second most significant. Improvement in height-for-age, which indicates long-term gains in nutritional outcomes, is also associated with longer-term improvements in crop availability, with cash crops proxying for improved economic resources in the district, and access to pulses, legumes, and nuts which represent important sources of proteins and fats.

Finally, **weather shocks, such as cyclones and drought, adversely impact households through a myriad of channels**, such as loss of crops and habitat, increase in infectious diseases, and reduced income. When districts were ranked according to the incidence

of cyclone damage, differences between the top and bottom quartiles suggest important negative effects of cyclones on weight-for-age, however, the effect is even worse on height-for-age, suggesting greater damage to children's long-term growth prospects.³² Incidence of a shock during the critical period of 13 to 24 months of life is much more detrimental than later exposure. These findings are becoming more important since the overall incidence of cyclones has intensified over the period. According to the 2001 Commune Survey, about 20 percent of the districts had never been exposed to a cyclone, and 15 percent of communes were hit by at least one cyclone in the preceding three years. However, by 2007, the incidence of weather shocks had become more widespread with over 40 percent of the districts having all communes hit by a cyclone. Econometric analysis shows that the negative trends of height-for-age, weight-for-age, and stunting between 1997 and 2004 in some districts, are partly explained by this increased incidence in weather shocks.

Seasonal patterns also deeply impact the nutritional situation of the most at-risk groups, especially in the chronically food insecure areas such as the South and the South-East, as proven by a seasonal increase in malnutrition prevalence.³³

Prevalence of behaviors conducive to better child nutrition

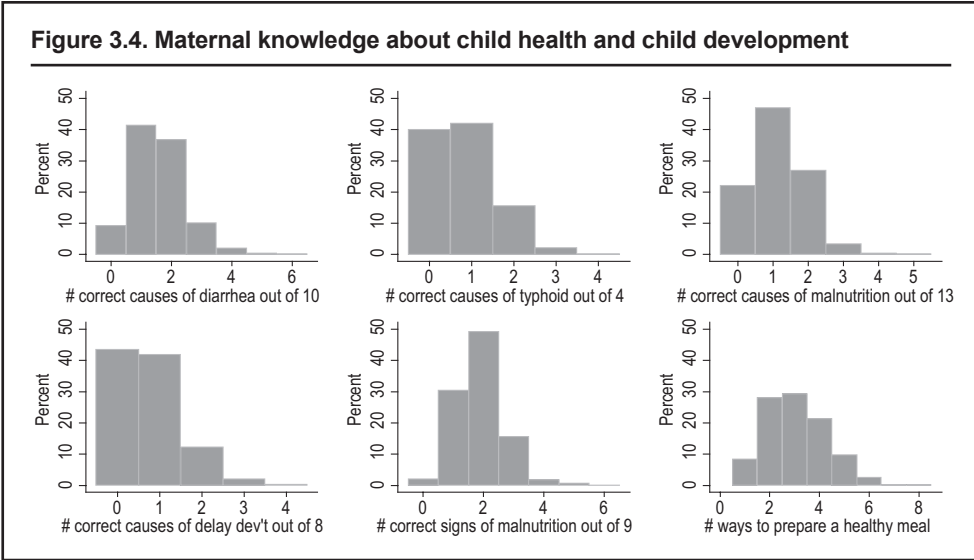
The Anthropometric and Child Development surveys provide an insight into the prevalence of behaviors conducive to better child nutrition in Madagascar. Box 3.1 below provides a description of the core concepts that the survey managed to capture.

Box 3.1. Maternal knowledge and self-efficacy

Knowledge: Several studies have found a close correlation between a mother's knowledge and practices of child care and her child's nutritional outcome. Most of the studies reviewed aggregate multiple knowledge-related variables (nutritional practices, exclusive breastfeeding, complementary feeding) into a single index using principal components analysis. In Lesotho, nutritional knowledge captured by this type of index is positively associated with children's growth, but only for households possessing a minimum level of resources.³⁴ On the other hand, for poorer households, this association between knowledge and children's growth was non-existent. In Ghana, an improved-care index was constructed to include knowledge on nutrition and hygiene. The study revealed that exposure to improved care during the first six months of life is a key input in children's nutritional status.³⁵ Finally, an analysis of a composite index constructed using several feeding practices from Latin American DHS surveys shows a positive correlation of the index with the anthropometric status of children.³⁶

Self-efficacy: Self-efficacy³⁷ is a psychological domain that pertains to personal judgments about one's ability to execute a future course of action. In US literature, improved self-efficacy is associated with better quality of mother-toddler interactions³⁸ and is believed to have a protective effect for the health and development of children living in poverty. Maternal self-efficacy is thus an important mediator between nutritional inputs and a child's health and development outcomes. However, this relationship is not well documented in low-income countries. The self-efficacy scores in the EA in Madagascar refer to the perceived ability of mothers to carry out actions in the specific domain of child care.³⁹

The level of knowledge about child nutrition and care is dismally low in Madagascar. According to the 2007 EA (Figure 3.4), 75 percent of mothers are only able to identify one or two common causes of diarrhea among children, and 10 percent fail to point out any correct causes.



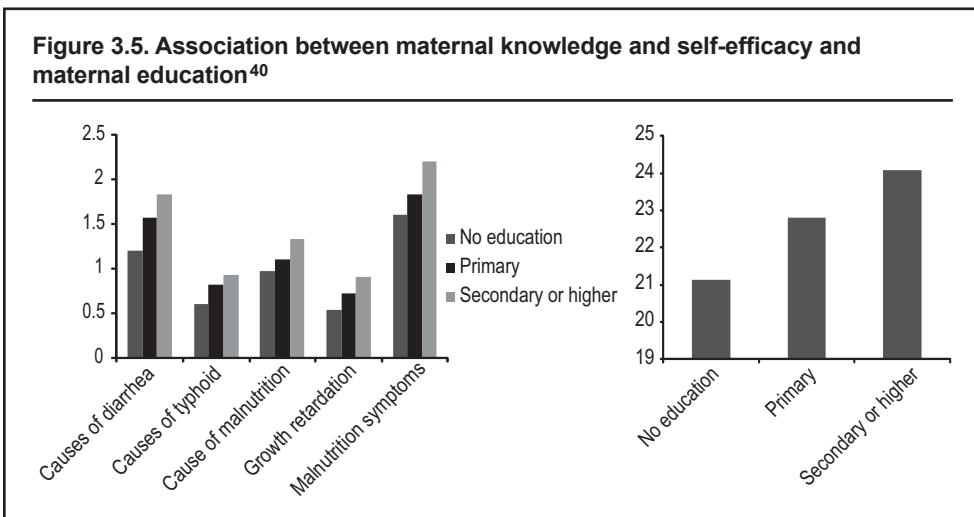
Source: 2007 EA.

Similarly, 20 percent are not aware of any signs of malnutrition, and 80 percent can only identify one or two symptoms out of nine most common observable ones. Analogously, over 20 percent of mothers cannot identify a single correct cause out of 13 most common causes of malnutrition, 45 percent identify only a single correct cause, and only 27 percent identify two correct causes.

Both knowledge and self-efficacy are positively associated with maternal education as can be seen in Figure 3.5.

Community-based Nutrition Program

Malnutrition interventions are carried out through the national community-based nutrition program, targeting children from a very young age⁴¹ and employing a preventive approach to promote behavioral change based on existing resources, with locally



Source: WB calculations using 2007 Anthropometrics and Child Development Survey.

adapted messages. The program revolves around a monthly growth monitoring and promotion activity as a focal point to raise awareness of mothers about the importance of malnutrition. On a monthly basis, a community nutrition worker weighs all the children under the age of two⁴² and provides counseling to the mothers about the nutritional status of their children as indicated by the growth chart. If the child's growth chart shows no progress or if s/he misses a weighing session, the community nutrition worker undertakes a home visit. The promotion of behavioral change is complemented by nutrition and hygiene education sessions, which highlight the importance of exclusive breastfeeding, the timing and composition of the introduction of complementary food, and appropriate feeding practices and child care during illnesses. Finally, the community nutrition worker provides cooking demonstrations to promote proper weaning practices, and prepares recipes that rely on locally available products to promote a diversified diet.

Box 3.2. Creation of a National Community Nutrition Program

To address the persistently high rates of chronic malnutrition and improve the nutritional status of children under the age of three, and of pregnant and lactating mothers, with financing from the World Bank in 1999, Madagascar expanded a community-based nutrition program, SEECALINE (*Surveillance et d'Education des Ecoles et Communauté en matière d'Alimentation et Nutrition Elargie*) which started in two provinces in 1995. The community-based program adopts preventive approach to combat malnutrition.

The program was initially targeted to the most malnourished and most vulnerable districts of the country. The selection of the district was based on the nationally representative 1997 EA.⁴³ All districts⁴⁴ that had an average malnutrition rate (moderate underweight) above the national average were selected for the intervention, amounting to 43 percent of the country's districts. In addition, ten rural districts affected by droughts and cyclones in the year 2000 were added to the program. By the beginning of 2002, the program was operational in 3,600 project sites, covering about half the communes in half the districts in the country. In 2002, six additional urban districts were added, in the aftermath of the political crisis. Emergency sites were opened to alleviate the impact of the crisis on urban populations, and were subsequently made permanent.⁴⁵ The program expansion was planned to reach a coverage rate of 50 percent of all children under three in the intervention areas over a period of four years. In practice, about a third of the sites were established between 1999/2000, another third between 2000/2001 and the remainder between 2001/2002. Starting from the year 2005, the Government adopted a single common package of activities, harmonized across different nutrition actors, including SEECALINE. By 2006, the national program covered 5,515 sites, amounting to around 70 percent of the communes of the country and about 56 percent of the total target population. It stands out as one of the few examples from African countries of a sustained and large-scale community-based intervention designed solely to combat malnutrition. As of this report, 5,550 sites are operational and cover around 1.1 million children under five, which represents a third of this age group within the total population.

The community-based nutrition program has a positive effect on child-care practices: even controlling for maternal education, mothers living in program villages exhibit a higher level of knowledge and maternal self-efficacy. Table 3.1 provides evidence of a correlation between the availability of the SEECALINE program at the village level and maternal knowledge about causes and signs of malnutrition and cause of typhoid.

This association, although not proving a causal link, provides suggestive evidence that the program is likely to have enhanced maternal knowledge about child health, in an environment with very low overall knowledge levels. It is interesting to note that

Table 3.1. SEECALINE availability and maternal knowledge and self-efficacy⁴⁶

	Cause of Diarrhea	Cause of typhoid	Cause of malnutrition	Causes of child retardation	Correct signs of malnutrition	Ways of preparing a healthy meal	Self-efficacy index
Village with SEECALINE program	0.109 (0.096)	0.232** (0.104)	0.254*** (0.088)	0.076 (0.091)	0.186** (0.092)	-0.031 (0.112)	0.667** (0.392)

Source: World Bank's calculations based on EA 2007.

there is no correlation between program availability and knowledge about the causes of child retardation: the program had no specific messages about overall early childhood development, and hence the lack of association is not surprising.

The prevalence of correct child-care knowledge and practices (breastfeeding behavior, weaning practices, treatment of illnesses, and hygiene practices) is low; however the program resulted in significant improvements. Table 3.2 summarizes the incidence of recommended child-care practices across treatment status and in the overall sample of the 2004 survey.

Table 3.2. Child care practices in SEECALINE and non-SEECALINE survey sites (percentage of total number of mothers or children)

Micronutrient supplementation	SEECALINE	non-SEECALINE
received vitamin A supplementation	77.4	75.6
received message with vitamin A.	58.6	54.0
has health card (carnet de santé)	83.2	77.8
Traditional practices: breastfeeding		
exclusively breastfed during first 6 months	38.6	31.5
initially breastfed (within 1 hour of birth)	54.9	46.9
Fed colostrums (pre-lacteal)	80.5	71.2
mother ate more while breastfeeding	13.5	12.3
mother drank more while breastfeeding	55.3	55.4
Traditional practices: weaning practices		
<i>Non-dietary aspects of feeding</i>		
child eats different meal	18.5	14.9
child is encouraged to eat	80.2	79.5
meal consistency: boiled/puree	20.2	17.9
child eats alone	59.4	61.4
mother received nutritional counseling	50.0	19.2
Prenatal care, delivery		
assisted delivery (trained medical personnel)	51.4	53.8
received tetanus injection during pregnancy	17.8	14.4
received vitamin A after delivery	33.4	22.6
Treatment of illness*		
received ORS/homemade liquid	40.2	37.8
drank more during diarrhea episode	46.7	41.1
ate more during diarrhea episode	4.2	4.8
Hygiene practices		
garbage disposal: hole in the ground	54.3	46.7
water purification method: tablets or boiling	37.6	34.1
toilet: hole in the ground	56.6	46.4
hand-washing	31.2	25.3

Source: Galasso, Umapathi (2007).

Only 34 percent of mothers provided exclusive breastfeeding in the first six months of life. Mothers tend not to change their nutritional behavior during lactation (only 12 percent eat more). Any form of water purification and hand-washing is practiced by 36 percent and 28 percent respectively, and only 43 percent of the children drank more liquids during episodes of diarrhea.⁴⁷ The program had a significant impact on behavioral change in hygiene practices, with more appropriate disposal of garbage, toilet use, and improved methods of water purification, all of which reduce the likelihood of water and food contamination and, as a consequence, the vulnerability to environmental diseases and shocks.

Breastfeeding practices have improved. Exclusive breastfeeding until six months of age is the single most important maternal input that can affect child growth and development, and the impact evaluation found a 6.8 percentage point gain in exclusive breastfeeding (or 17 percent improvement) within SEECALINE communities. As a consequence of the program, improvements were also noted in non-dietary aspects of feeding, weaning practices, and vitamin A supplementation within eight weeks postpartum. It must be noted that these are the lower bounds of the extent of behavioral change since the treatment effect calculated at the community level includes both participating and non-participating mothers.

The annual reduction in the incidence of underweight attributed to the community-based nutrition program is of 1-1.5 percentage points. In the absence of the program, the country would have experienced an improvement in underweight incidence. The estimated trend varies between 2 and 4 percentage points between 1997/98 and 2004 or, equivalently, to an annual reduction of 0.4-0.6 percent per year. This trend is in line with international analysis that estimates the implied reduction in malnutrition rate to be around 0.5 percent a year.⁴⁸ However, the nutritional situation of children living in participating communities has improved more than the national average. Over the period of 1999 and 2004, the estimated effect of the availability of the program at the community level on the incidence of underweight ranges between 5.2 and 7.5 percentage points. This amounts to an estimated impact of 1-1.5 percentage point reduction per year.⁴⁹ If one considers that the program was gradually introduced across geographic localities with an average duration of program operation of three years, the adjusted impact estimate amounts to 1.7-2.5 percentage point reduction per year for participating areas. To give an idea of the overall size of the program effects: with a baseline incidence of underweight of 43 percent, the gains attributed to the program ranging 5.1-7.5 percentage points imply that the impact of the program ranges between 12 and 17 percent. Comparable calculations for stunting correspond to program gains ranging between 6 and 7 percent. Almost a third of the overall share of the observed change in underweight prevalence between 1997 and 2004 can be attributed to the program.

Maternal Health and Reproductive Health

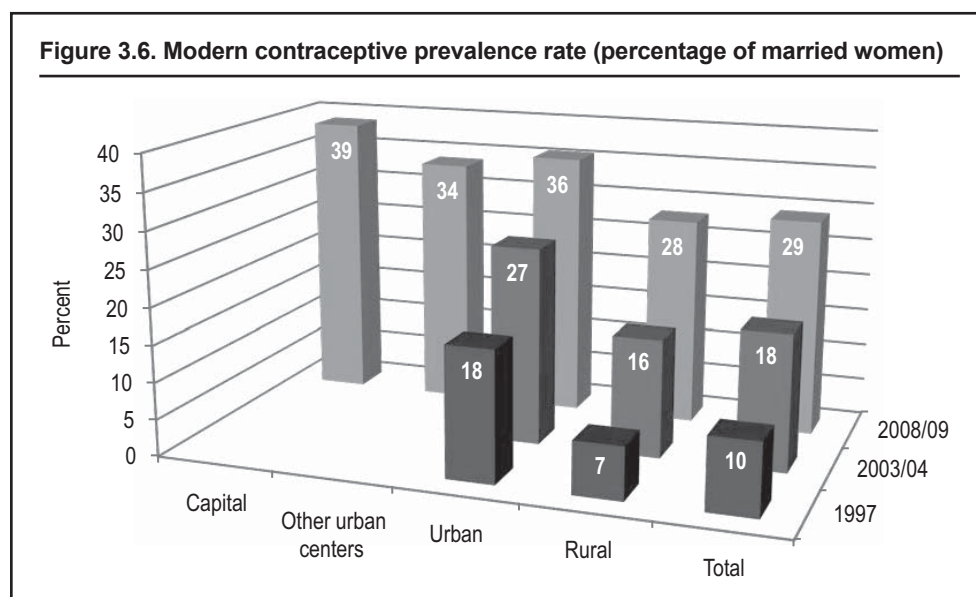
Family Planning Practices

Since 2002, family planning has moved up on the health agenda in Madagascar. The repositioning of the Family Planning program was seen as important for two reasons: (i) it is expected to have a positive impact on maternal and child morbidity and mortality, and (ii) there is a positive relationship between slowing demographic growth (through appropriate responses to unmet need) and economic growth. As a first step, the Ministry

of Health changed its name to Ministry of Health and Family Planning in June 2003. As a second step, it took the lead in organizing a series of stakeholder meetings to develop a new family planning strategy for the well-being of Malagasy couples, which culminated with a national conference. The Family Planning program subsequently gained recognition at the same level as the fight against HIV/AIDS and Roll Back Malaria. To encourage wide-spread use of modern family planning practices, the MoH is currently promoting family planning services (consultation and products) free of charge at public health facilities. The introduction and expansion of community-based provision of the injectable contraceptive Depo Provera has attracted many new users. Since 2006, the provision of Implanon (long-lasting contraceptive method, for up to three years) has been promoted with donor assistance, and other long-term methods are beginning to become more available through NGOs and the private sector.

The modern contraceptive prevalence rate is increasing, especially in rural areas. The increased attention on family planning translated into improved behaviors over the past five years. The use of modern methods of contraception surpassed the Sub-Saharan average of 23 percent of women,⁵⁰ and has more than doubled (from 18 percent of all married women to 29 percent), mostly due to remarkable improvements in the rural areas, albeit from a very low prevalence of 16 percent in 2003 to 28 percent in 2008 (Figure 3.6). However, these relatively uniform prevalence rates hide wide regional variations. In Androy, only 3 percent of women who are sexually active utilize a modern method of contraceptive, and an additional 1 percent practices a traditional method, meaning that more than 9 in 10 women do not use any method of contraception. Among the best performers is the capital region of Analamanga, where 39 percent of married women utilize a modern method of contraception.

The contraceptive mix relies heavily on short-term methods, such as injectable contraceptives (18 percent of all sexually active women) and oral tablets (6 percent). Between 2003 and 2008, in urban areas, the prevalence of injectable contraceptives in-



Source: DHS 1997, 2003/04, and 2008/09.

creased by six percentage points and in rural areas, by 8 percentage points. The prevalence of oral tablets increased only slightly in urban areas (from 6 percent to 8 percent) but doubled in rural areas (from 3 percent to 6 percent). Long-term methods, more effective in protecting against unwanted pregnancies and cost less over a three-year period, are not common but are gaining popularity in Madagascar. Implant methods that share the convenience of injectables, but last six to ten times as long, are used by only 1.5 percent of sexually active women. While the first generation implant (Norplant) required a minimal technological environment,⁵¹ which exists only in a few hospitals countrywide, the newer disposable Implanon can be inserted at the health center level. It is interesting to note that in Bongolava, the region that has the highest modern contraceptive prevalence rate, long term methods play a very important role (9.5 percent of women utilize implants). The prevalence rate of female voluntary surgical contraception has decreased in urban areas, decreasing by more than half between 1992 and 2008/09, while it has more than doubled during the same period in rural areas.

Unmet need remains a serious constraint for women in Madagascar and in 2008, one in five women who did not want more children or wanted to wait at least two years before having another pregnancy did not use modern methods of contraceptives (19 percent, compared to 24 percent five years earlier). As in other Sub-Saharan African countries, accessibility is not a significant reason for not using family planning services (only 0.8 percent of all non-users reported costs and lack of access as the main reason for not intending to use any modern contraceptive method).⁵² On the other hand, almost a third of the women (31 percent) had concerns about the safety of the contraceptive methods (18 percent feared side effects, 19 percent reported health concerns and one percent cited inconvenience). Although five years ago the second most important reason for not using contraceptives was knowledge-related (10 percent did not know of a method and 5 percent did not know of a source), in 2008 this proportion decreased to 5 percent.

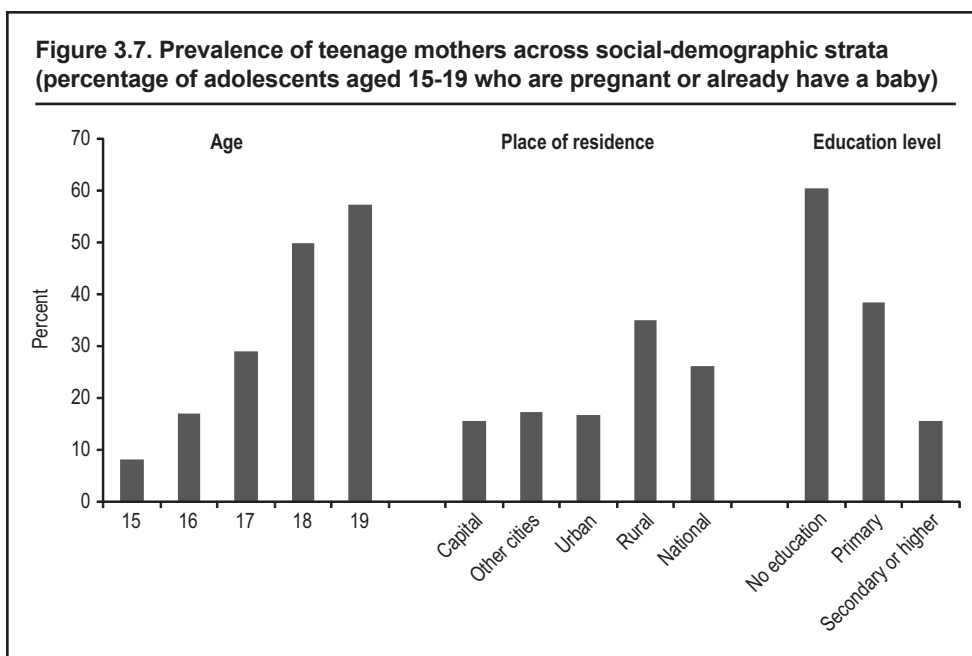
To date, Madagascar's family planning efforts have depended heavily on financing from donors such as UNFPA, USAID, and the World Bank, which altogether accounted 99 percent of spending for contraceptives from 2004 to 2008. Although in 2006, the Malagasy government allocated for the first time funds to purchase contraceptives, Madagascar cannot yet auto-finance its family planning program nor the procurement of contraceptives.

Reproductive Health of Adolescents

Adolescents begin their reproductive life very early, and adolescent pregnancy is a serious problem: according to the DHS 2008/09, more than a quarter (26 percent) of teenagers between 15 and 19 years old had at least one child, and 5 percent did so at 15 years of age or younger (Figure 3.7).

Additionally, 6 percent of adolescents were pregnant with their first child, while 50 percent of 18-year-old women had a child or were pregnant. This situation stagnated between 1997 and 2008, but has deteriorated overall since 1992. Very large differences were observed across place of residence and education level of girls as depicted in Figure 3.7.

The preliminary results of the most recent survey on the at-risk behaviors of youth (age 15 to 24 years old) indicates an increase in the incidence of sexual activity among both boys and girls between 2006 and 2008, however, there is a decrease in age at first sex.⁵³ In 2006, there were large differences between surveyed testing sites. The highest sexual activity rates, above 90 percent for both sexes, were reported in Behenjy⁵⁴



Source: DHS 2008/09.

and Ambositra,⁵⁵ while in Miarinarivo,⁵⁶ only 43 percent of boys and 25 percent of girls reported being sexually active. There are no significant differences across religion and place of residence (urban vs. rural). However, sexual activity for girls decreases with level of education, while for boys, it does not vary significantly.

The prevalence of condom use to prevent unplanned pregnancies and STIs, while improving, is very low. Around eight in ten sexual intercourse acts put young girls at unnecessary risk for pregnancy. The available data from 2006 (Table 3.3) suggests a very positive relationship between the level of education and condom use (only 6.5 percent and 3.6 percent of uneducated boys and girls, respectively, used a condom during their last sexual intercourse, while 27.5 percent and 28.3 percent of those with high-school education did so). There are also wide gaps in favor of the urban population for both girls and boys (22.1 percent vs. 10.2 percent for boys, and 23.0 percent vs. 9.5 percent). Thus, uneducated rural girls are the most at risk for unplanned pregnancies.

Table 3.3. Prevalence of at-risk sexual behaviors of youth (2006 and 2008 data)

	Boys		Girls	
	2006	2008	2006	2008
Percentage who are sexually active	73	74.7	67	69.3
Percentage who had the first intercourse at 15 years old or younger	32.8	29.0	39.3	37.5
Percentage who know where to purchase a condom, close to their home, or place of work	n/a	56.6	n/a	51.1
Percentage of those who are sexually active who used a condom during the last sexual intercourse	16.0	21.3	16.0	22.0

Source: Enquête de Surveillance Comportementale 2006 and 2008.

Antenatal Care

Antenatal care (ANC) is important for the health of the mother and the likelihood of survival of the infant. The antenatal period provides an opportunity to reach pregnant women with a number of interventions, including immunization against tetanus toxoid, prevention and treatment of malaria, management of anemia through iron supplementation, assisted delivery by a skilled health care provider, and critical information on birth spacing. While the WHO recommends at least four ANC visits, even one visit may improve the health of the infant and ensure a healthier pregnancy for the mother.

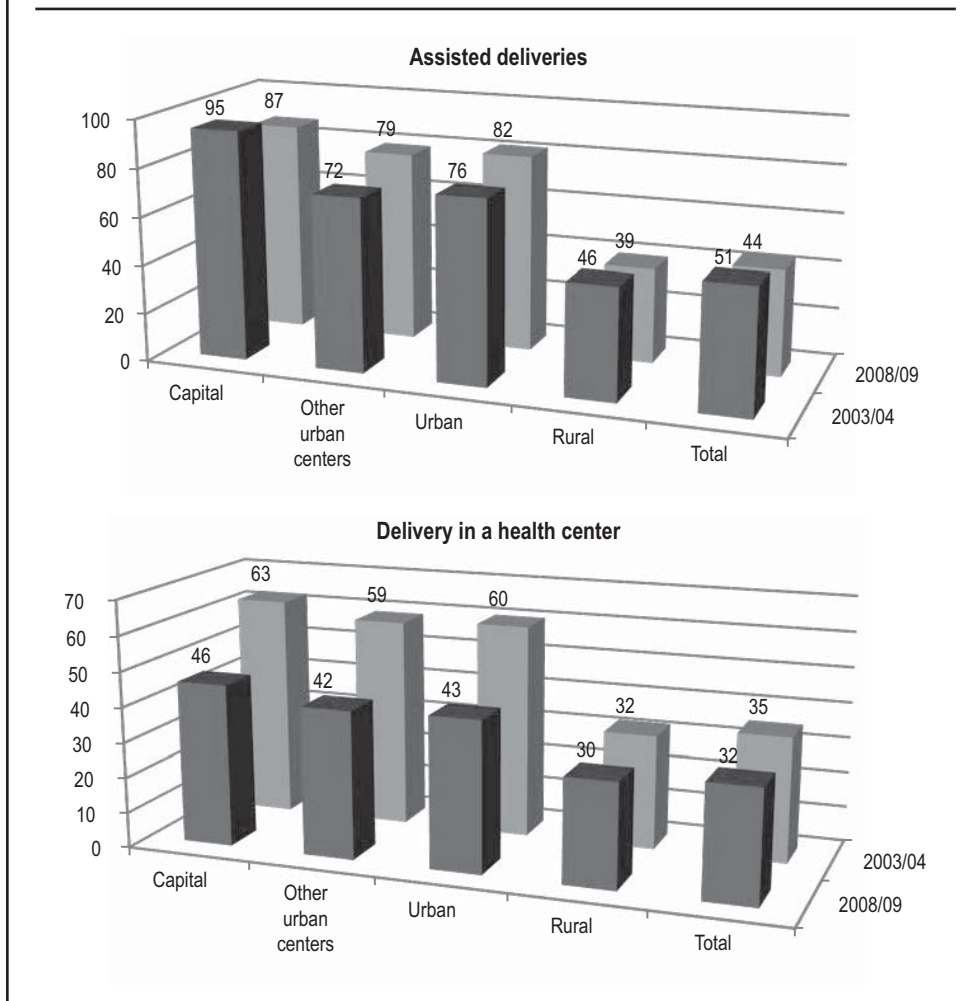
Antenatal coverage is high, however, there are large socio-economic differences. In Madagascar, 86 percent of women attended an ANC with a skilled professional according to the results of DHS 2008/09, representing a moderate increase over the previous five years both in urban and rural centers; in 2003, ANC coverage was at 80 percent, 77 percent for rural areas and 90 percent for urban centers. However, according to this DHS, little under half of pregnant women had the WHO recommended four ANC visits (49 percent⁵⁷). These results are significantly better than the Sub-Saharan average coverage of 72 percent for antenatal care and 42 percent coverage for four ANC visits.⁵⁸ Despite these elevated rates of antenatal care attendance, only 48 percent of pregnant women received at least two shots of the neonatal tetanus immunization (the minimum to provide adequate protection), and 70 percent had adequate protection.⁵⁹

Assisted Deliveries

Assisted deliveries in Madagascar decreased from 51 percent to 44 percent between 2003 and 2008, especially in rural areas and in the capital; but deliveries in a health center marginally increased. Medically trained assistance during delivery improves the health outcomes of the mother by preventing or treating postpartum hemorrhage and that of the newborn in the immediate postnatal period. According to the results of the 2008/09 DHS, a smaller percentage of women sought medically trained assistance during childbirth than in the previous five-year period (Figure 3.8). Unlike for all other behavioral changes for which indicators in rural areas have improved, the decrease in childbirth assistance is attributable to poorer coverage in rural areas and in the capital. However, more women delivered in a health center but this percentage remains alarmingly low, especially in rural areas (35 percent overall, 32 percent among rural residents, and 60 percent in urban areas).

Medically trained assistance at delivery varies across regions and is correlated to income and the level of education of the mother. Unlike for antenatal care, there were wide geographical variations in the provision of assistance at delivery in 2008: in Antananarivo, 87 percent of women give birth assisted by a medical professional, while in rural areas, only 39 percent do so. In the region of Vatovavy Fitovinany, barely 1 in 10 women deliver with medical assistance (12 percent of all births). In addition, there is a clear correlation between income, the level of education of the mother and the likelihood of professionally attended deliveries. While 23 percent of mothers with no education seek professional assistance during childbirth, that share rises to 42 percent and 76 percent among mothers with primary and secondary education respectively. Across income groups, differences are even wider, 22 percent of the poorest mothers compared to 90 percent of the better-off deliver with medical assistance.

Figure 3.8. Assistance at delivery (percentage of women who had medically trained assistance at birth, and percentage of women who delivered in a health center)



Source: 2008/09 DHS.

Referral and emergency services are generally difficult for women to access, particularly in rural areas, further amplifying some of these differences. Health centers manned by a doctor are not always accessible and distances to district level hospitals are even greater. In addition to the physical inaccessibility, the costs associated with the visit (direct costs, medicines, transport and lodging for family members) constitute a barrier to access. Box 3.3 outlines the objectives and preliminary results of a pilot to provide emergency obstetrical and neonatal care free of charge in the regions of Boeny and DI-ANA, with a view to scaling up so as to address the financial barriers.

Box 3.3. Pilot to cover the direct and indirect costs related to emergency obstetrical and neonatal care in the regions of Boeny and DIANA

To reduce maternal and neonatal mortality, a pilot project is being undertaken to provide care related to obstetrical and neonatal emergencies free of charge in the regions of Boeny and DIANA (the University Hospital in Majunga, the regional reference hospital in DIANA, the Type II district hospitals in Nosy Be and in Marovoay) since April/May 2008. These are two regions in the north of Madagascar, where the poverty rate is lower than 50 percent.⁶⁰ The pilot is designed to cover all patients needing emergency obstetrical and neonatal care through a third-party payer system. The specific objectives of the pilot are to: (i) cover charges related to dystocic deliveries, cesarean surgeries, and pediatric emergencies for infants 0 to 6 months of age; (ii) increase the number of assisted deliveries; (iii) increase the revenues of the targeted hospitals; and (iv) improve the quality of obstetric and neonatal emergency care in the targeted facilities.

Financed by the Bank-financed Sustainable Health System Development Project (SHSDP), an NGO was sub-contracted to manage the funds necessary to run the payment system. The patient seeks the approval of the NGO prior to receiving care, presents this information to the hospital at the time of service, and the hospital presents the receipts to the NGO for payment of fees. Eligible expenses include all expenses related to treatment (drugs and supplies, laboratory tests, and x-rays), room and board for the patient and one accompanying relative.

In the first year, the program covered 1,754 women in Boeny and 1,030 in DIANA. However, the number may be artificially high if: (i) cases that should otherwise have been referred to other (paying) health centers were 're-routed' to the hospital so as to benefit from the free coverage under the pilot, or (ii) a number of caesarians were prescribed when not necessary. The one-year review of the pilot revealed that despite the fact that all treatment charges are covered, patients continue to have significant out of pocket expenditures, between Ariary 40,000 on average (US\$20) in Marovoay and Ariary 100,000 (US\$50) on average in Nosy Be. Most of the out of pocket expenditure (64 percent) is for drugs and supplies purchased within the hospital or a private pharmacy. However, the review also revealed that patient satisfaction with services is very high for the pilot (around 90 percent in Majunga and Marovoay, and 100 percent in DIANA and Nosy Be).

In response to low assisted deliveries, in 2008 the MoH introduced safe delivery kits, for both normal and cesarean deliveries, resulting in deliveries becoming free-of-charge at the health center/hospital level. The provision of these kits is now in jeopardy as donor funding for this critical health input has been reduced as a result of the crisis, and supplies have run out at many health centers and hospitals. With the support of UNFPA, funds have been mobilized to reinstate free cesarean deliveries; but additional resources will need to be secured to avoid any further unnecessary interruptions of this crucial activity. While the gratuity initiative is expected to have an impact on women's behaviors, the fieldwork for the 2008/09 DHS was undertaken too early to capture this effect.

Child Spacing

Although child spacing in Madagascar has improved over the last ten years, nearly one in four births occurred less than 24 months from the preceding one. A child born within 24 months of its predecessor is 1.85 times more likely to die, confirming the need to encourage adequate spacing of pregnancies. Long term methods of contraception are effective in increasing spacing between births and avoiding unwanted pregnancies. Intra-uterine devices and hormonal implants are more cost-effective, and less prone to failure and discontinuation than short-term methods such as the pill and condoms. In

Madagascar, since 1997, this interval has been increasing, from 29 months in 1997 to 33 months in 2008, but stagnated in the past five years; however, in 2008, almost one in four births (23 percent) occurred less than 24 months from the preceding one. As expected, trends in child spacing follow the same socio-economic trends as the other indicators of women's reproductive health, with the problem being more acute in rural areas (24 percent of all births), among least educated (27 percent), the poorest quintile (27 percent).

Abortion

The abortion rate is estimated at approximately 1 for 10 live births and contributes greatly to the maternal mortality ratio.⁶¹ Among women who already had children, 24 percent have already had an abortion.⁶² While abortion is sometimes the resort of young women attending school in urban areas, it is more often practiced by older women with several children in rural areas, where contraceptive availability is relatively lower. It was estimated that between 1975 and 2000, deaths related to abortion accounted for 52 percent of maternal mortality in Antananarivo, while it accounted for only 40 percent of maternal mortality in rural areas during the same period due to the risk of maternal death from other causes.

Communicable Diseases

Malaria

The four plasmodium species are endemic in Madagascar: *P.falciparum* (estimated for 90 percent of all cases), *P.vivax* (6 percent), *P.ovale* (1 percent), *P.malariae* (3 percent), and three mosquito species play a major role in transmitting malaria (*A. gambiae*, *A. arabiensis*, and *A. funestus*). Malaria transmission is characterized by four epidemiological profiles (Figure 3.9).

Malaria transmission is stable on the East coast where it occurs all year long and on the West coast where, except for July and August (dry season), transmission is intense. These patterns translate into high mortality rate in young children and pregnant women. Transmission is unstable in the Central Highlands and, in many years, it is almost absent, while in the semi-desert in the South, it is very unstable and follows a seasonal pattern.⁶³ These patterns translate in low immunity in the population, severe morbidity and mortality in all age groups, and severe seasonal and periodic epidemics. As such, the national malaria control strategy includes the following elements:

Indoor Residual Spraying in unstable transmission zones and a key component of the malaria elimination strategy for the Central Highlands. Its advantage is that it does not require any individual behavior change or community normative change, but only the support of the community leader and a comprehensive information campaign for the population. To mitigate dichlorodiphenyltrichloroethane's increasing costs, and avoid the development of insecticide resistance, indoor residual spraying campaigns follow a three-year rotation of different classes of insecticides⁶⁴ since 2005.

Long Lasting Insecticide-treated Bednets. The Government's goal is for every household in stable transmission zones to have two nets. The distribution strategy is three-fold: (i) free distribution during national campaigns targeting all children under five; (ii) free distribution through health centers to pregnant women during first ante-natal care visit and to children upon completion of routine immunizations, at around nine



Source: President's Malaria Initiative, Malaria Operational Plan FY09.

months of age; and (iii) social marketing of highly-subsidized nets⁶⁵ through community health workers and rural shops. While distribution of insecticide-treated bednets during campaigns and social marketing is adequate, the supply at the local health center level is *ad hoc*. There is currently no systematic, rapid, and reliable way to ensure transportation for commodities such as artemisinin-based combination therapy (ACT), insecticide-treated bednets and rapid diagnostic tests, between the district pharmacies and/or storage facility and the commune-level pharmacy in the health center. While the current system, relying on individuals transporting the commodities on their own (often in bush taxis) functioned well prior to the introduction of ACT, rapid tests, and long lasting insecticide-treated bednets, it does not ensure routine distribution to the community level anymore. These items are either bulky or have a short expiration date.

Improved case management in health centers combined with increased use of rapid diagnostic tests nationally, and *community-based treatment with ACT* in areas of stable transmission. According to national policy, malaria diagnosis should be confirmed by microscopy at hospitals and by rapid diagnostic tests at all health centers. However, both of these tests are under-utilized. While microscopy has a user fee of approximately US\$1 per test, rapid diagnostic tests are provided free-of-charge. Nevertheless, supervisory visits confirm that stocks of the latter are expired or near expiry at the health center level. Thus, diagnosis is still done based on clinical symptoms, such as fever. Poor planning at the national level is also evident in the management of ACTs: during a World Bank field visit in May 2008, it appeared that many health centers received ACTs only two months prior to the expiration date.⁶⁶ Since 2008, with support from Population Services International (PSI), treatment of uncomplicated malaria with ACT is available through community health workers, pharmacies and medical stores. At the health center level, there is no fee charged for a sick child visit or malaria treatment.

Intermittent Preventive Treatment for pregnant women (IPTp) in areas of stable transmission. Malaria during pregnancy leads to anemia in the mother and a low birth weight of the fetus. According to the DHS 2008/09, 38 percent of pregnant women and 39 percent of breastfeeding mothers were estimated to be anemic. Since 2004, the Government's strategy is to provide two doses of directly observed sulfadoxine-pyrimethamine free of charge to pregnant women for the prevention of malaria in areas of stable transmission. For treatment of malaria cases during pregnancy, the national protocol calls for quinine during the first trimester and ACTs during the second and third trimesters.

Table 3.4. Malaria indicators 2004-2008

Indicator	2004	2005	2006	2007	2008	Eastern/ Southern Africa ²
Percentage of households owning at least 1 bednet	—	—	—	—	62 ¹	48
Percentage of households owning at least 1 ITN	21.9	25	45.1	59.2	67.2 57 ¹	39
Percentage of children under 5 years of age who slept under a bednet the previous night before the survey	—	—	—	—	49.4 ¹	31
Percentage of children under 5 years of age who slept under an ITN the previous night before the survey	15.9	21	37.5	60.2	65.5 45.8 ¹	26
Percentage of pregnant women who slept under an ITN the previous night before the survey	11.9	22	32	54.9	63.7 46 ¹	32
Proportion of person per net	5.71	—	5.41	—		—
Percentage of children under 5 yrs with fever that received efficacious anti-malarial medicine the same/next day	6.4	10	18.1	—		16
Percentage of children under 5 yrs with fever that received any anti-malarial medicine the same/next day	64.6	60	52.1	—	8.1 ¹	
Proportion of women who received 2 or more doses of IPTp during their last pregnancy in the last 2 years ¹					6.4 ¹	
Proportion of targeted houses sprayed with a residual insecticide in the last 12 months	—	9.4	10.1	9.8	52.2	

Source: National Malaria Control Program, Roll Back Malaria, Malaria National Level Report, 2008; ¹ DHS data; ² Data for 2006–2008 from Malaria and children: Progress in intervention coverage, Summary update 2009, UNICEF.

With support from USAID, the MoH has trained public health center staff, trainers and regional supervisors in administering IPTp. However, continued training is necessary especially in treatment of malaria during pregnancy, and the need to use quinine as opposed to ACTs during the first trimester. The national malaria control strategy also calls for training of private health service providers. While community health workers are not included in the delivery of IPTp, they promote demand for, and utilization of, prenatal services.

Progress in Madagascar has surpassed regional control efforts. Compared to Eastern and Southern Africa, a higher proportion of households have access to and utilize home preventive methods, and a higher proportion of children have access to anti-malarial medication. Utilization coverage of insecticide treated nets by children under five⁶⁷ is double the average of other countries in the region, and has increased three-fold during the past four years.

HIV/AIDS

HIV/AIDS prevention knowledge remains moderate among the most-at-risk populations but behavior is slowly changing. A behavioral survey of most-at-risk populations (military, truck drivers, and youth) was conducted in three waves in 2004, 2006, and 2008,⁶⁸ providing insights into their attitudes and behaviors towards sex and their HIV/AIDS knowledge (Table 3.5). Knowledge of HIV/AIDS transmission and prevention remains moderate among the three groups although there was a slight improvement between 2004 and 2008. However, there have been certain setbacks such as for youth whose knowledge of means of prevention actually fell according to the 2008 results.

Table 3.5. Changes in indicators of HIV knowledge and behavior among most at risk groups (2004, 2006, and 2008)

Indicators	Boys (15-24 yr)			Girls (15-24 yr)			Truck drivers			Military		
	'04	'06	'08	'04	'06	'08	'04	'06	'08	'04	'06	'08
Knowledge of three main means of prevention (percentage of total)	63	67+	66.3	57	66+	62.6	54.9	52	58.3+	48	53+	55.2+
Knowledge of fake beliefs on transmission (percentage of total)	53	57+	—	57	57	—	60	56		78	84+	—
Age at first intercourse	16.9	16.8	16.9+	16.5	16.5	16.6+	18.3	18.3	—	18.4	18.6+	—
Percentage who had two or more sexual partners in the past 12 months	38.6	42.2	38.0+	25.8	22.5+	19.5+	48.0	39.0+	46.5	39.5	34.5+	35.2
Percentage who have used a condom during the last intercourse (excluding intercourse with sex-workers)	19.6	14.1	19.3+	15.8	16.5+	22.2+	53.8	48.0	52.1+	56.4	47.4	63.6+
Percentage who have used a condom during last intercourse with a sex-worker	24.4	26.9+	31.9+	20.1	22.0+	26.5+	67.8	69.1+	71.3+	78.1	70.8	80.2+
Percentage who sought voluntary testing for HIV and received the results	2	8+	18.0+	4	9+	21.2+	12	17+	25.9+	25	39+	75.5+

Source: Behavioral survey of at risk populations, 2004, 2006, and 2008.

A “+” sign denotes an improvement in the indicator with respect to previous survey.

Research suggests that the risk of HIV infection increases with number of concurrent partners especially if one engages in unprotected sex. In Madagascar, these negative behaviors are slowly decreasing among the surveyed groups: condom use is slowly increasing and the proportion of those who have multiple partners is decreasing. While voluntary testing is not commonly observed, there have been remarkable improvements for all at-risk groups, especially among the military.

Sexually Transmitted Infections (STIs)

STI rates, in particular, syphilis, are extremely high in Madagascar among most at-risk populations. Underscoring this is data from a sample of households surveyed for the 2003/04 DHS, which revealed a syphilis prevalence of 6.3 percent among adults aged 15–49. However, STI rates are much worse in high-risk groups. The main contributing factors are unfavorable sexual practices, which continue to be an important risk, as illustrated by age at first sexual relation, high numbers of concurrent sexual partners and low levels of condom use, as well as lack of awareness that STIs are a serious health problem.

A broad national STI control program was launched in 2003 focused on the promotion and use of STI treatment kits. A syndromic approach⁶⁹ to diagnosis is employed and two standardized STI kits for treatment are sold at a subsidized price in the public sector and at a slightly higher price, in the private sector through social marketing in pharmacies and *depôts pharmaceutiques*.⁷⁰ The pre-packaged therapy contains antibiotics to treat the STI, enough condoms for the duration of treatment, partner referral cards, and educational and informational leaflets. Since 2006, 697,500 Genicure kits to treat genital ulcer syndrome, and more than one million Cura-7 kits to treat genital discharge syndrome, have been distributed and/or sold in the public and private sectors.⁷¹ In addition, as syphilis treatment for pregnant women has been shown to be highly cost-effective,⁷² a syphilis campaign for pregnant women is being implemented in regional and district hospitals as well as in about 350 rural health centers.

Tuberculosis (TB)

Table 3.6. Tuberculosis treatment, pilot program indicators

Diagnostic and treatment centers	Enrolled patients	Currently in treatment	Treated	Lost to follow-up	Percentage lost to follow-up
Itaosy	182	41	112	22	12
Manjakandriana	46	10	33	0	0
Betafo	104	21	54	22	21
Tsiroanomandidy	123	45	74	1	1
Ambatondrazaka	174	45	126	0	0
Ihosy	48	36	12	0	0
Maevatanana	219	33	182	1	0
Marovoay	258	51	191	7	3
Mahabibo	207	31	168	0	0
Sakaraha	78	12	50	10	13
Toliara	69	26	35	6	9
Total	1,508	351	1,037	69	5

Source: SHSDP data.

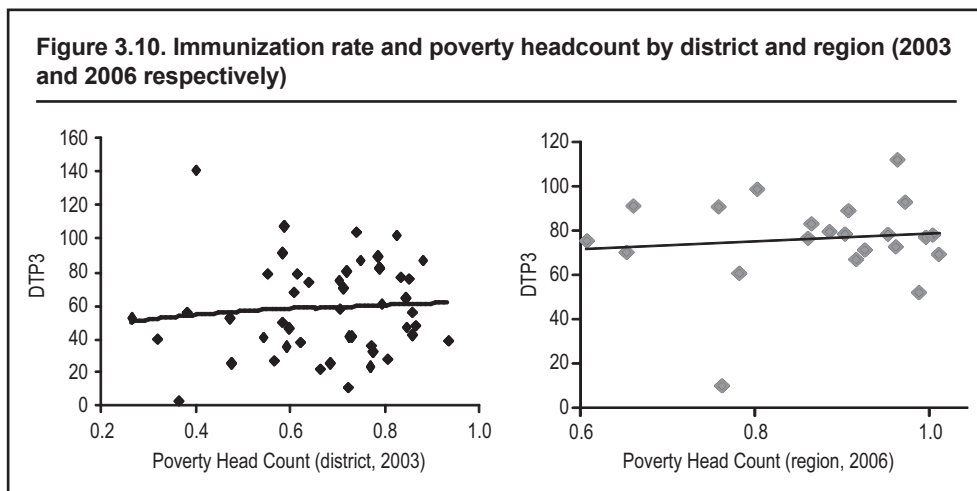
Adherence to TB treatment is improving. Madagascar has 141 diagnostic and treatment centers at type II health centers and at the district hospital levels, and 800 treatment centers at the public and private health facility level. A program that aims at increasing the treatment rate, and reducing the number of patients lost to follow-up has been piloted by the MoH⁷³ since April 2008. The program fully subsidizes TB treatment costs (transportation and room/board) for all patients in 11 diagnostic and treatment centers. A year later, in June 2009, 1,508 patients had enrolled in the program, of which 351 were under treatment. The number of patients lost to treatment is significantly lower than the national average of 17 percent (Table 3.6).

Health Care Access and Utilization by the Poor

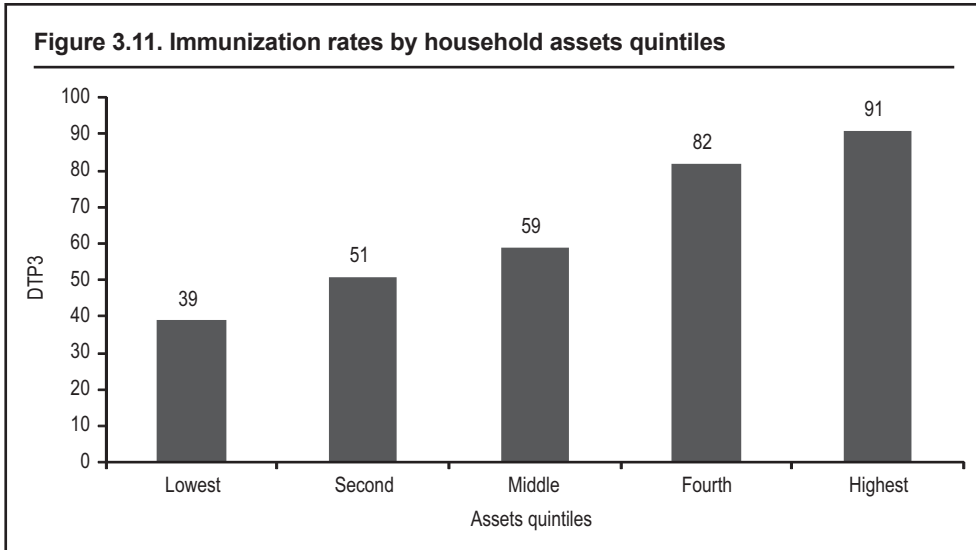
Inequalities in access to health services occur most dramatically across households (within an individual district) rather than across districts or regions. Taking immunization rates as an illustration, two different analyses give contrasting messages. A district-level analysis of immunization rates in relation to the poverty head count shows no significant association. In other words, it suggests that poverty was not a substantial barrier to primary health care in 2003. Figure 3.10 relates the coverage for the complete series of the DTP3 in each district to the proportion of adults below the poverty line in that district in 2003. If one or two abnormally high immunization rates in the plot (which may be due to measurement error) are disregarded, the relationship shows no clear negative impact of poverty head count on this measure of health care utilization. The same conclusion holds true for the analysis of the regional level indicators in 2006 (Figure 3.10).

However, a very different story emerges from looking at household-level data from the 2003/04 DHS (Figure 3.11). There is a strong positive correlation between a household's wealth quintile (as measured by an index of its assets) and DTP3 vaccination coverage (the same measure of health care utilization as in the district-level analyses).

Financial barriers and physical access are among the top reasons that prevent households from seeking health services as needed; but the main reason is that the

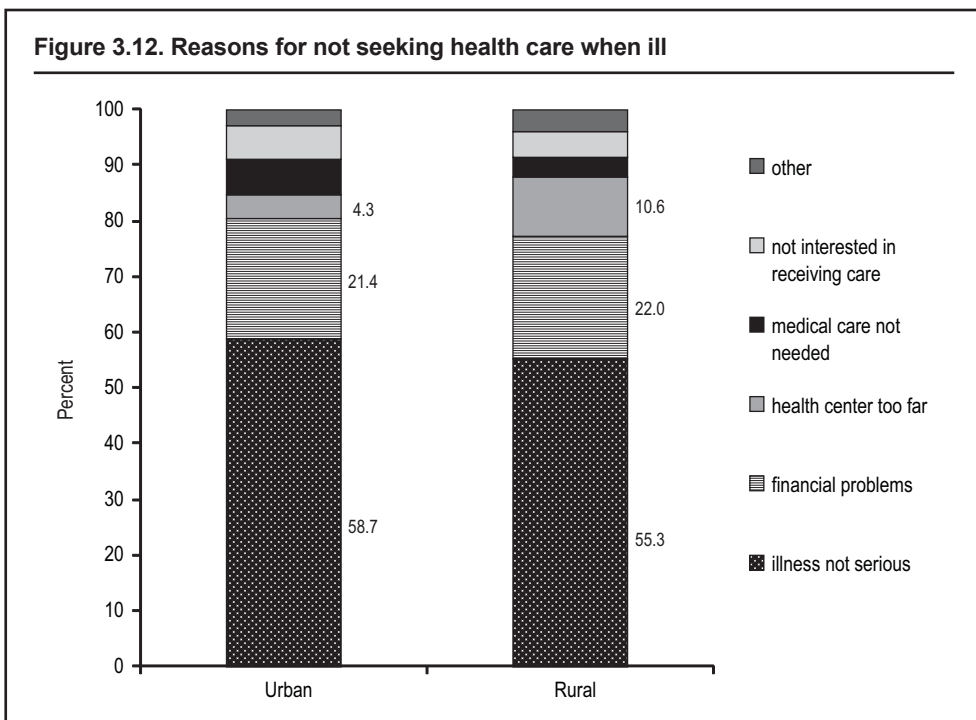


Source: SHSDP data.



Source: DHS 2003/04.

illness was not considered serious. According to the latest household survey in 2005, some 60 percent of those reporting an illness did not visit a health center. The top three reasons cited by respondents included lack of financial and physical access and the fact that they did not consider the illness to be important (Figure 3.12).



Source: INSTAT Household Survey 2005.

Note: The proportion of the top three responses are indicated on the graph.

For those who went to a health facility, a recent Poverty and Social Impact Assessment (PSIA) revealed that proximity of a health center and financial assistance are the two most important factors affecting the decision to seek care for the poorest populations.⁷⁴ Among those interviewed (those that were eligible to receive free care), almost one in three reported that financial assistance was the most important determinant for visiting a health facility. Almost one in five said that the close proximity of the health center allowed them to seek care.

Proximity to a health center is also particularly critical in Madagascar where numerous communities are seasonally isolated for months at a time, leaving entire populations—not only the poor—with little access to health centers (for a specific example see Box 3.4). Even those isolated communities that do have a health center suffer during the rainy season, since referrals to hospitals are nearly impossible, replenishment of drug supplies is slower, and supervisory visits are non-existent.

Box 3.4. Distance to the nearest health center: the case of a village in Majunga region

To reach the health center in Anakazomborona, one must drive 54km for 2 ½ hours by car. However, 80 percent of villagers travel by zebu carts. Those who do not own a zebu or a cart have to rent one at a cost of Ariary 5,000 and the trip can take between eight and nine hours.

Source: PSIA, 2007.

The Government has introduced a series of mechanisms to try to address financial access; for example, an equity fund insurance scheme across Madagascar that covers the cost of drugs for the poorest. Under the cost-recovery mechanism, 2.22 percent of the revenues from drug sales are allocated to this health equity fund. Members of the Health Committee of the Commune or the mayor of the *fokontany* (village) are responsible for identifying and regularly updating the list of beneficiary families.⁷⁵ An in-depth discussion of all the available insurance mechanisms is available in Chapter IV *Sector Financing*. There are also several programs being piloted throughout the country, designed to reduce both the direct and the indirect costs of treatment in need. The “Multi-denominational assistance group for the poor” is a GTZ project in Majunga region that provides transportation assistance for poor patients who are referred to the hospital. Another pilot covers all indirect and direct costs (transportation, room and board, medical procedures, and drugs and consumables) for all referred cases of obstetrical and neonatal emergencies in four hospitals in the regions of Boeny and DIANA in northern Madagascar (Box 3.3). A program by the French NGO Santé Sud pilots a different approach by placing general practitioners into communities (Box 3.5).

Ensuring financial and physical accessibility to health care is necessary but not sufficient to guarantee that households seek care when ill. Knowledge about curative services for common illnesses (diarrhea, malaria, ARI, persistent cough) is lacking, and in most cases, the illness is not considered serious enough to seek healthcare.⁷⁶ This leads to high self-medication rates, with drugs and antibiotics purchased without prescription on the parallel market. More than seven out of ten people who reported being ill and did not seek treatment at the health facility self-medicated instead.⁷⁷ Some may not have consulted a health facility because they deemed it unnecessary as the availability

Box 3.5. Santé Sud program

To expand medical coverage to rural areas, a private sector innovative approach to place general practitioner doctors in remote communities, was developed by the French NGO Santé Sud, based on their project experience in Mali. The NGO works in close collaboration with the MoH and partnerships with the National Order of Doctors and the Association of Doctors in Rural Areas. Since 2003, 42 doctors are participating in the program. These community doctors commit to offering the minimum packages of services that include both curative services such as consultations and deliveries, and preventive services such as antenatal care consultations, postnatal consultations, vaccinations, and family planning.

The program supports the set-up costs of young general practitioners in communities without a public or private health facility and that have a population of 7,000 to 8,000 people in a radius of 15 km. However, in practice, most of the doctors are over the age of 35, have graduated more than five years prior to their enrollment in the Santé Sud program, and have worked previously in the public or private sector. Also, the 2008 review of the program revealed that some practices are set up as close as 200 meters to a health center although the average distance to the nearest health facility is around 9 km. After the initial set-up, the doctors in the program are supervised by Santé Sud, and receive training as necessary.

This approach has demonstrated that with basic inputs, necessary infrastructure, and continuous training and supervision, general practitioners are willing to work under difficult conditions in remote rural areas that are economically viable. However, while such an initiative could work in communities that lack physical access to a health center, but whose members have the financial means to cover the user fees, it may not be a viable model for most remote rural areas where such a practice may not generate enough revenues to be financially viable. It is likely that many remote rural populations will be unable to afford the consultation fees charged by the community doctors. Currently, the fees of Santé Sud doctors range between Ariary 500 for immunizations and Ariary 40,000 for a two to three day mini-hospitalization. Fees related to childbirth range between Ariary 8,000 and Ariary 24,000.

of over-the-counter self-medication treatments, such Palustop⁷⁸ (malaria), Viasur (dehydration), Cura7 and GeniCure (STI), have been promoted across the country. However, up to 20 percent⁷⁹ of those who are ill may be at risk of incorrect self-medication. During transmission peaks for ARI and malaria, and in case of epidemics such as rotavirus, the MoH should make use of mobile telephone technology to instantly provide vital public health messages to the population. Wide-spread public health information campaigns can be carried out through text messaging during these vulnerable periods to encourage populations to seek the necessary health care.⁸⁰

Notes

1. DHS 2008/09.
2. The minimum recommended by WHO.
3. UNICEF. (2009). *The State of the World's Children*. New York: UNICEF.
4. Ibid.
5. Ibid.
6. Ibid.
7. Alaora Mangoro, Antsinana, DIANA and Bongolava.
8. Haute Matsiatra, Ihorombe, Atsimo Andrefana, Androy and Anosy.
9. World Health Organization Vitamin and Mineral Nutrition Information System. (2006, 12 06). Global Database on Iodine Deficiency. Data from: Hantaniaina R. *Rapport de l'évaluation des 7 postes sentinelles TDCI* [Report of IDD evaluation in 7 sentinel sites]. Antananarivo, *Service de Nutrition et Alimentation*, 1995.

10. The concentration index (CI) is used to quantify the degree of socio-economic related inequality in health variables. When the index takes a negative value, it indicates a disproportionate concentration of the health variable among the poor. If the health variable is desirable, such as utilization of ORT, a positive value of the concentration index means utilization of ORT is higher among the rich. However, it should be noted that when comparing CIs, it cannot be said that an index of value of 0.02 is twice the value of 0.01.

11. This indicators represent percent of children whose mothers have knowledge about ORS/ORT

12. It is surprising to see that the gap between ORT knowledge and utilization is the widest for the richest quintile group, which may be partially attributed to use of other medicines (pills, syrups, antibiotics, or injections).

13. Data is from 2008 PSI TRaC study

14. Derriennic, Y. (2009). *POUZN Project Trip Report Madagascar*. USAID.

15. Various authors. (2008, January - February). Maternal and Child Undernutrition. *The Lancet*, 371 (9608-9611).

16. Stunting measured as being 2SD below the reference height-for-age value.

17. Grantham-McGregor, S., Bun Cheung, Y., Cueto, S., Glewwe, P., Richter, L., & Strupp, B. (2007, January 6). Developmental potential in the first 5 years for children in developing countries. *The Lancet*, 369 (9555), pp. 60-70.

18. Grantham-McGregor, S., Fernald, L., & Ani, C. (2000). The role of nutrition in intellectual and behavioral development in children. In R. Sternberg, *Environmental Effects on Cognitive Abilities*. Cambridge: Laurence Erlbaum Associates.

19. Grantham-McGregor, S., Bun Cheung, Y., Cueto, S., Glewwe, P., Richter, L., & Strupp, B. (2007, January 6). Developmental potential in the first 5 years for children in developing countries. *The Lancet*, 369 (9555), pp. 60-70.

20. Deaton, A. (2007). Height, Health and Development. *Proceedings of the National Academy of Sciences*, 104 (33), pp. 13232-13237. Glewwe, P., & Jacoby, H. (1995). An Economic Analysis of Delayed Primary School enrolment in a Low Income country: The Role of Early Childhood Nutrition. *Review of Economics & Statistics*, 77 (1), pp. 156-169. Also see special issue of the *Lancet* (2008) dedicated to child undernutrition, which provides an excellent review of the existing studies on the effects of child undernutrition.

21. The WHO standards were utilized to calculate z-scores for the anthropometric indicators: weight-for-age, length/height-for-age, and weight-for-length/height (World Health Organization. (2006). *WHO Child Growth Standards: Length/Height-for-age, weight-for-age, weight-for-length, weight-for-height, and body mass index-for-age: Methods and development*. Retrieved March 2009, from <http://www.who.int/childgrowth/publications/en>). A software macro was downloaded from the WHO web site and run on the survey dataset. Extreme z-scores for each indicator were flagged according to the following system:

Weight-for-age z-score (waz) $waz < -6$ or $waz > 5$

Length/height-for-age z-score (haz) $haz < -6$ or $haz > 6$

Weight-for-length/height z-score (zwl) $zwl < -5$ or $zwl > 5$

These flags were used for censoring biologically implausible scores (only 3 measures in our sample).

22. First survey of children under three years old in 2004 and follow-up of the same children in 2007.

23. The estimate table of socio-economic correlates of nutritional outcomes is available in Appendix 4.

24. Alderman, H., & Behrman, J. (April 2004). *Estimated Economic Benefits of Reducing Low Birth Weight in Low-Income Countries*. HNP Discussion Paper. Washington: World Bank.

25. Svedberg, P. (1990). Undernutrition in Sub-Saharan Africa: Is there a gender bias? *Journal of Development Studies*.

26. The two competing hypothesis for this unsettled debate are either biological or related to preferences for females. On the one hand, boys are believed to be less robust, especially at young ages, and exhibit higher mortality rates by year one. On the other hand, women in Sub-Saharan Africa play an important role in agriculture but are a scarce factor in agricultural production. This price

effect is believed to reduce the incentives to discriminate against girls (Boserup, E. (1970). *Woman's Role in Economic Development*. Allen & Unwin.).

27. WFP (2005) Comprehensive Food Security and Vulnerability Analysis of Madagascar.

28. Data used in this analysis is from the commune census of 2001, FOFIFA and INSTAT.

29. Haddad et al 2002.

30. Details are presented in Appendix 4.

31. Trends were analyzed at the sub-national level and analysis was carried out on the correlation between district-level average changes in nutritional outcomes between 1997 and 2004 with changes in district-level averages in area characteristics obtained from census data of 2001 and 2007; fixed effect results of the analysis are presented in Appendix 4.

32. A district's cyclone intensity is proxied by the average number of communes in that district that experienced a cyclone over 1998-2000. "High intensity" districts lie in the top quartile of this index, and "low intensity" districts lie in the bottom quartile of the cyclone intensity. Heights and weights are from the anthropometric surveys of 1997 and 1998, averaged at district level.

33. (2005). *Profil Nutritionnel de Madagascar*. Food and Agriculture Organization, Division de l'Alimentation et de la Nutrition (p.30).

34. Ruel, M. T., Habicht, J.-P., Pinstrup-Andersen, P., & Grohn, Y. (1992). The Mediating Effect of Maternal Nutrition Knowledge on the Association between Maternal Schooling and Child Nutritional Status in Lesotho. *American Journal of Epidemiology*, 135 (8), 904-914.

35. Ruel, M. T., Armard-Klemesu, M., & Arimond, M. (2001). A multiple-method approach to study childcare in urban environments. *FCND Discussion Papers* (116).

36. Ruel, M. T., & Menon, P. (2002). Creating Child Feeding Index Using Demographic and Health Surveys. *FCND Briefs* (131).

37. Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman.

38. High maternal self-efficacy is related to maternal sensitivity, warmth (Teti & Gelfand 1991) and responsiveness (Stifter & Bono 1998).

39. The self-efficacy section of the 2007 survey contains questions about ability to influence child's nutritional and health status under hypothetical scenarios. For instance mothers were asked:

"According to you, would you consider yourself to be able to look after your child if: a) The child has parasites, b) has diarrhea, c) has fever, d) has growth difficulties, e) needs vaccinations, f) needs to attend health services". The response is evaluated on a scale from 1-4 where: 1 = not at all, 2 = a little, 3 = fairly well, 4= very well. Other situations include ability to prepare special child meals, or record children's growth and take appropriate measures to promote child growth. The self-efficacy index is constructed by summing up the responses to all the self-efficacy questions.

40. Maternal knowledge refers to the number of correct answers in each scenario. The self-efficacy score was based on the reported perceived ability (on a scale of 1-4) of the mother to act if the child was ill.

41. The target population was originally 0-3 years old and pregnant/lactating women in the first phase but subsequently was refined with a focus on children 0-2 with age appropriate messages, and a less frequent monitoring of children 3-5.

42. Additionally, children 24 to 59 months old are checked upon on a quarterly basis.

43. This date represents the base-line for the impact evaluation.

44. 46 districts out of a total of 108 districts.

45. It is important to note that within districts, there has been partial coverage of communes, and within communes, partial coverage of Fokontanys (villages).

46. World Bank's calculations based on EA 2007. The coefficients and standard errors are obtained from an ordered probit using as an outcome the number of correct answers with respect to the early child symptoms and causes of malnutrition and disease as identified by a mother as a function of the presence of SEECALINE in the village and controlling for maternal education. *** denotes $p < .001$; ** and * denote $p < .01$ and $p < .05$ respectively.

47. Impact analysis results are presented in Appendix 4

48. Alderman, H., Haddad, L., Appleton, S., Song, L., & Yohannes, Y. (2003). Reducing Child Malnutrition: How far does income growth take us? *World Bank Economic Review*, 17 (1), 107-131.

49. Galasso and Umapathi (2009) "Maternal Education, Child-care and Nutritional Status: Lessons from a Nutritional Program" (unpublished).
50. Contraceptive prevalence rate for 2007 (percent of women ages 15-49). Source: World Development Indicators, 2009.
51. Steam sterilizer, surgical facility.
52. Nyangara, F., Hart, C., Spizer, I., & Moreland, S. (2007). *Unmet Need for Family Planning in Rwanda and Madagascar: An Analysis Report for the Repositioning of Family Planning Initiatives*. MEASURE Evaluation Project, and analysis of most recent DHS for Sub-Saharan countries. Reasons were grouped under the following categories: socio-cultural, method safety, fertility related, knowledge related, and access related.
53. Enquête de Surveillance Comportementale 2006 and 2008.
54. Vakinankaratra region in Antananarivo province.
55. Amoron'I Mania region in Fianarantsoa province.
56. Itasy region in Antananarivo province.
57. However this indicator represents antenatal care visits to both trained professionals and traditional birth attendants. Preliminary results for 2008/09 DHS do not distinguish the number of visits assisted by trained medical professionals alone.
58. UNICEF. (2009). *The State of the World's Children*. New York: UNICEF.
59. WHO recommends two injections during pregnancy, or three life-time injections with the last one administered within the five years preceding the birth.
60. Ministère de l'Interieur. (2007). *Rapport National de Suivi des OMD*. Antananarivo, Madagascar: United Nations.
61. L'avortement à Madagascar, Bulletin d'Information sur la Population de Madagascar, March 2005 (Gastineau & Razafiarison, 2005).
62. Direction Générale de la Lutte contre le SIDA and Direction de la Surveillance Epidémiologique des IST et du VIH/SIDA. (2003). *Etude Combinée des Séroprévalences de l'infection à VIH et de la Syphilis chez les Femmes Enceintes*. Ministère de la Santé.
63. Madagascar: Duration of the Malaria Transmission Season Mapping Malaria Risk in Africa. (2001 June). *Madagascar: Duration of the Malaria Transmission Season*. Retrieved 2009 15-July from Maps of Malaria: <http://www.mara.org.za/pdffmaps/MadSeasonality.PDF>.
64. In the first year, spraying was done with pyrethroid; in the second year, with carbamate; and in the third year, with dichlorodiphenyltrichloroethane.
65. Financed by the President's Malaria Initiative (PMI) and the Global Fund.
66. Aide Memoire of mission of Dr. Eisele to Madagascar to ensure coordination of World Bank activities with current/planned malaria control efforts in Madagascar, World Bank, May 29 2008.
67. 46 percent according to 2008/09 DHS and 66 percent according to Roll Back Malaria report.
68. Le Comité National de Lutte contre le SIDA (CNLS). (2004). *Enquête de Surveillance Comportementale*. Focus Development Association. Antananarivo: Présidence de la République.
69. STIs are classified by syndrome. Each syndrome is made up of a combination of symptoms and clinical signs identified upon examination. The four main symptoms are: (i) urethral discharge for men; (ii) lower abdominal pain for women; (iii) vaginal discharge for women; and (iv) genital ulcers in both men and women.
70. Cura-7 is a kit combining ciprofloxacin and doxycyclin for genital discharge while Genicure combines ciprofloxacin and penicillin. Both kits include (i) basic information on STIs, (ii) instructions for using the drugs, (iii) illustrations of the respective syndromes including genital diseases that are not covered by the kits, (iv) condoms to avoid re-infection and (v) advice on referring sexual partner(s) for treatment.
71. World Bank Supervision Aide memoire of the Second Multi-sectoral STI/HIV/AIDS Prevention Project, August 2009, Appendix 1.
72. Terris-Prestholt F, W.-J. D. (2003). Is antenatal syphilis screening still cost effective in sub-Saharan Africa. *Sexually Transmitted Infections*, 79 (5), 375-81.
73. Financed through the Sustainable Health System Development Project (SHSDP), World Bank.
74. Keener, S., Walker, W. M., & Hall, D. (2007). *Analyse de la pauvreté et de l'impact social: les soins de santé et les pauvres*. The World Bank Group, Africa Region. Washington, DC: The World Bank.

75. A review of the FANOME/Health Equity Funds system is planned for through GAVI Alliance funding. See Health System Strengthening Proposal http://www.gavialliance.org/resources/HSS_Madagascar_R4.pdf.

76. Out of those who reported malaria symptoms and chose not to seek treatment, more than six out of ten did so because they thought the illness was not serious. This also holds for people reporting persistent coughs and ARI symptoms.

77. Institut National de la Statistique. (2006). *Enquête périodique auprès des ménages 2005: rapport principal*. Ministère de l'Economie, des Finances et du Budget, Secrétariat General. Antananarivo, Madagascar: INSTAT.

78. Palustop has been recently replaced by Actipal which is no longer available over the counter.

79. In urban areas, 76.5 percent of those who are ill and do not attend a health center self-medicate themselves. Out of those who did not attend a health center, 25.7 percent cite access issues. Combining these two statistics results in an upper estimate of 20 percent. Similar calculations can be done for rural areas: 32.6 citing accessibility problems for visiting a health center, and self-medication rates are at 71.5 percent. While exact calculations could be possible, survey data of the health module of the household survey was not available for this report.

80. Mobile telephone subscriptions in Madagascar have exponentially increased since 2000 from 0.4 subscribers per 100 people to 11.3 in 2007, and 23 percent of the population is covered by the mobile cellular network.

Health System Performance

The previous two chapters of the report gave an overview of health outcomes and determinants, both in terms of individual/household behaviors and utilization of health services. This chapter will provide a brief overview of sector organization and then analyze the performance of the health sector, identifying bottlenecks in the delivery of quality health interventions.

Sector Organization

Deconcentration of the Health Service Delivery System

After independence, the national health system in Madagascar was highly centralized following the French administrative model. The Constitution, laid the groundwork for decentralization in 1992 by outlining a local service delivery structure including provinces and peripheral levels. Beginning in the mid-1990s, certain sectoral ministries, including the MoH, began to shift limited decision-making power away from the center and towards lower levels. However, this was not a real decentralization of decision-making or accountability, but rather referred to as deconcentration of spending given that these lower level structures had little actual discretion in decision-making or in the allocation and management of resources. Nonetheless, in an effort to improve public resource management and strengthen the public service delivery system, the Government introduced twenty-two regions (doing away with six provinces) and sought to reinforce the role of the regions by progressively integrating the deconcentrated technical services of the public administration under the authority of the regional Chiefs, with the objective of harmonizing all sectoral activities in a specific region through integrated regional development plans. In 2008, for the first time, resources were allocated to the regions, making them responsible for the implementation of a small part of the investment budget. While the efficiency of the regional administration is uneven, new regional plans have contributed significantly to the harmonization of Government activities.

The health delivery system is aligned with the administrative structure of the country and includes the central, regional and district levels. Each level has defined roles and responsibilities: (i) the central level provides the strategic direction, defines policies in the sector and oversees national coordination of sector activities; (ii) the regional level or Regional Department of Health coordinates the implementation of the national health policy in the region and provides technical assistance to the districts; and (iii) the district level or District Health Authority provides health services through the district hospitals and health centers.

Treatment in Madagascar is provided by both public and private health providers as well as by traditional healers. Those in need of medical attention seek treatment

at public health centers (45 percent), private health clinics (34 percent) or at traditional healers.¹ Their choice is heavily influenced by the cost of the treatment, their proximity to the source of healthcare, the flexibility of the service provider's payment mechanisms, and perception of provider quality which includes the treatment the patients receive and the availability of medicines. Even though the public sector offers the bulk of health services in the country, the private sector represents a very important share of service delivery, particularly in the capital Antananarivo and other major cities.

Figure 4.1. Public and private health care delivery network

Public Sector	Private Sector
Hospital network <ul style="list-style-type: none"> • CHU (university hospital) • CHRR (regional hospital) • CHD I (district level hospital) • CHD II (district level hospital) Basic health center network <ul style="list-style-type: none"> • CSB I (primary care health center) • CSB II (primary care health center) Public health institutes National laboratories Municipal and community hygiene offices	Not for profit network <ul style="list-style-type: none"> • hospitals and referral centers • OSTIE and attached dental cabinets and laboratories • hospitals and health centers of NGOs For profit network <ul style="list-style-type: none"> • hospitals and private clinics • private cabinets • opticians and prosthetics • traditional practitioners
Community Based Health Care Services	

Basic health centers are the first point of contact in the system followed by district and regional hospitals (Table 4.1). There are two types of basic health centers in Madagascar, CSB I and II. CSB II are managed by a doctor and a paramedical staff while CSB I are managed by paramedical staff and aides. In 2007, there were 1,139 CSB I and 2,064 CSB II across the country covering a population of around 10,000 each, varying between 2,000 and 14,600. There are also two types of district level hospitals, CHD I and CHD II. There are 70 CHD I, based in district headquarters but offering similar services to those offered in a CSB II. There are 52 CHD II, also based in district headquarters but offering emergency surgery and comprehensive obstetrical care and providing referral health services.² The next level of the system includes 20 regional hospitals, some of them offering secondary referral services. Finally, there are four university hospitals offering comprehensive national referral services.³

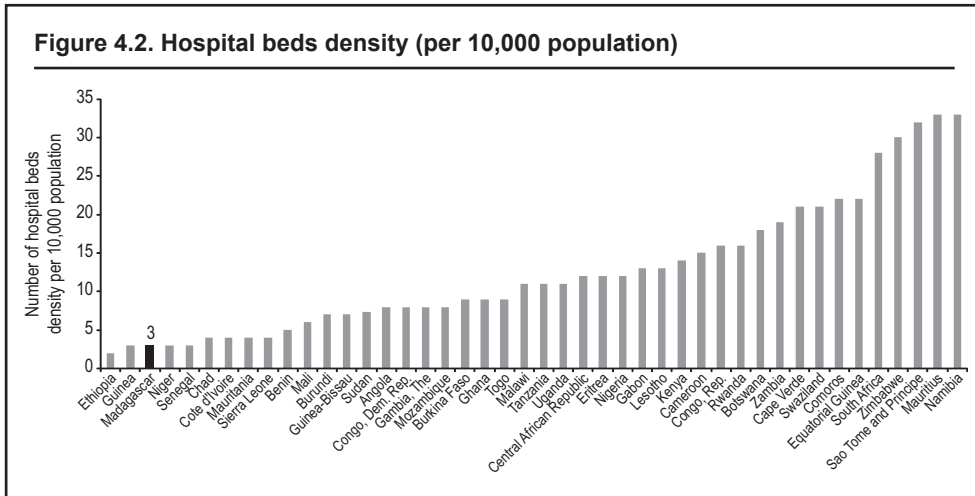
Table 4.1. Number of medical facilities in 2007, by type and by sector⁴

Type of Establishment	Public	Private religious	Private non-religious	Total
CSB I	1,007	73	59	1,139
CSB II	1,586	110	368	2,064
CHD I	67	2	1	70
CHD II	21	12	19	52
Regional Hospitals	20	-	-	20
University Hospitals	2	-	-	2
Total	2,703	197	447	3,347

Source: Carte Sanitaire 2007.

There are 3,347 medical facilities in Madagascar, 80 percent of which are public. A comprehensive list of all the private health centers and hospitals in Madagascar is not available. Figures available from the 2007 Health Map, based on data collected from all the health centers and districts consolidated by the MoH's Statistical Services every three to four years, revealed that out of 3,347 medical establishments in Madagascar, 80 percent were public health centers, and the remaining 20 percent were private, mainly located in urban areas.

Madagascar ranks very low among African countries in terms of hospital care availability. Another component of service delivery is the in-patient beds density, and Madagascar ranks the third lowest in Africa with only three beds per 10,000 population (Figure 4.2).

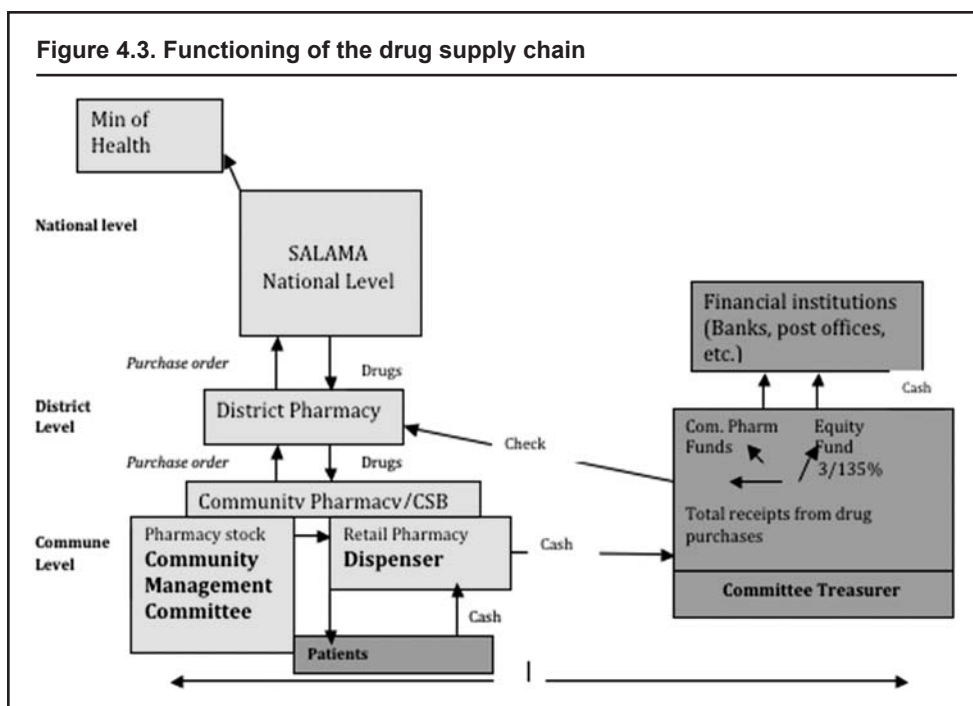


Source: World Development Indicators, 2010 graph represents the most recent health statistics for all available countries in Africa.

Pharmaceutical Sector

The public drug supply chain in Madagascar starts at the central level with SALAMA which supplies the District Pharmacies, which in turn provide drugs to the health centers (this organization is illustrated in Figure 4.3). SALAMA is the semi-autonomous central drug procurement agency for the Government of Madagascar. It supplies District Pharmacies, based on their purchase orders, who in turn, supply the health centers with drugs. The management of District Pharmacies is frequently sub-contracted to local NGOs paid through a small mark-up⁵ on medicines and medical supplies sold to health centers. District Hospital Pharmacies are also managed by civil society at a flat contractual rate.

The supply of the health center is based on purchase orders submitted through the Community Pharmacies. The latter are supervised by the Community Management Committee, which is elected by members of various villages that fall within a health center area. Drugs, which have been prescribed by staff at the health center, are then sold to patients through the retail side of the Community Pharmacy, which is administered by the Dispenser. Both the Dispenser and the Guard are paid for by the commune out of a subsidy from the Government. Money from the sale of drugs is received by the Dispenser, who transfers it on a regular basis to the Committee Treasurer. The money is then deposited into an account, in a bank or a post office, on a regular basis. The account generally requires the signatures of both the Treasurer and President for any transaction.



Source: Sharp, M. and Francken, N., *Service Delivery in the Education and Health Sectors in Madagascar*, 2009.

In cases where it is difficult to open a bank account, a provision is made for the health center to use the account of the district. The funds from sale of drugs are used by the Committee and Community Pharmacy to purchase drugs, pay for transport, management, banking fees, upkeep of the basic health center infrastructure and stipends for the President and Treasurer of the Committee. Parallel to the public sector, the for-profit private sector accounts for 40 percent of drug sales in Madagascar. In urban areas, there are private pharmacies, while in rural areas, there are “*dépositaires de médicaments*.”

Since 2008, the MoH has adopted a plan for integrated supply chain and logistic plan for the procurement and distribution of essential health commodities (PAIS), which integrates the regions into the drug delivery system. It aims to enhance the availability of essential health commodities at the regional, district, and community levels. It seeks to integrate 90 percent of the supplies of the vertical programs into a unified distribution system implemented through SALAMA. A pre-requisite of the successful implementation of the program is therefore to strengthen the supply/distribution system of SALAMA and eliminate the existing bottlenecks (the management and monitoring of pharmaceutical stock and the distribution logistics).

Human Resources

Madagascar, like thirty-five other African countries, is confronting a critical shortage of health workers (less than 2.3 doctors, nurses and midwives per 1,000 people). However, the situation varies by level of specialty. While the physician density is one of the highest on the continent, 2.91 doctors per 10,000 population, Madagascar has a disproportionately low number of nurses and midwives, 3.16 personnel per 10,000 population. The resulting ratio of nurses and midwives to physicians (1.1) is therefore the lowest in Africa (Table 4.2).

Table 4.2. Total numbers and densities of health workforce in 2002

Health workers	Madagascar total	Madagascar density (per 1,000)	Africa Region density (per 1,000)
Physicians	5,201	0.291	0.217
Nurses and midwives	5,661	0.316	1.172
Dentists and technicians	410	0.023	0.035
Pharmacists and technicians	175	0.010	0.063
Environmental and public health workers	130	0.007	0.049
Laboratory technicians	172	0.010	0.057
Other health workers	530	0.030	0.173
Community health workers	385	0.022	0.449
Health management and support	6,036	0.337	0.411
Total	18,700	1.045	2.626

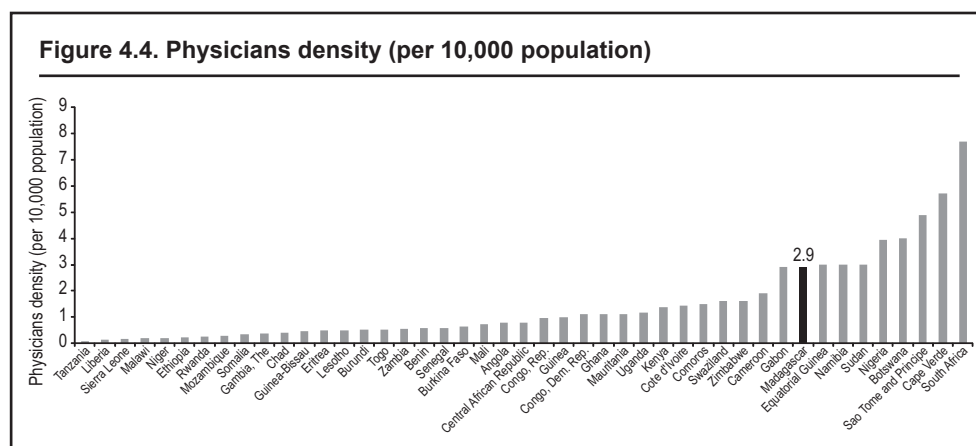
Source: Country Health System Fact Sheet 2006, WHO.

Despite a relatively high physician density, there are notable shortages for various specialties. The density of physicians in Madagascar is relatively high, compared to other countries in the region (see Figure 4.4), however the study on emergency obstetrical and neonatal services revealed a severe shortage of specialists. There is a need of an additional 72 gynecologists and the delivery of pediatric care is of high concern, since only eight regions have pediatricians.

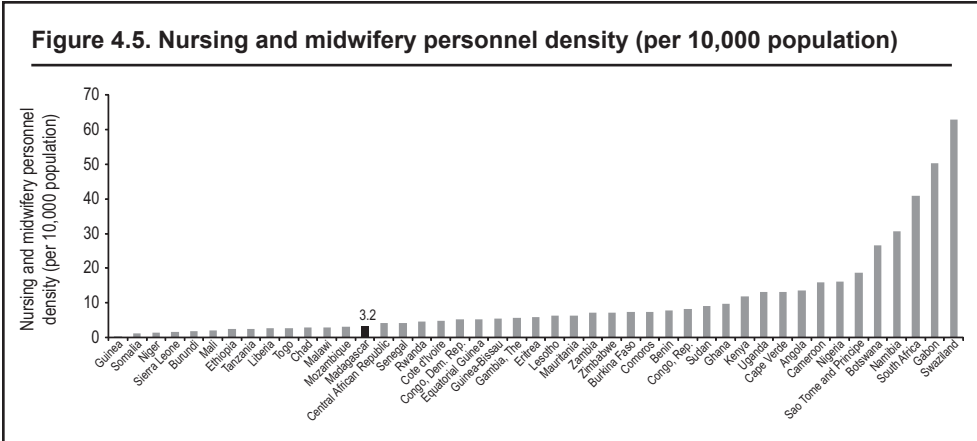
There is also a shortage of nurses and midwives in Madagascar. The study on emergency obstetrical and neonatal care identified significant shortages of nurses at both the district hospital (CHD1) and the health center (CSB2) levels, as well as a shortage of midwives at the district hospital (CHD1) level. Overall, compared to other countries in the region, the number of nurses and midwives is very low, and Madagascar ranks the sixth lowest in Africa (see Figure 4.5).

There is a severe imbalance in the Malagasy health workforce between nurses and doctors. There are almost as many doctors as nurses in the health network, which results in a ratio of 1.1, the second lowest in Africa (see Figure 4.6).

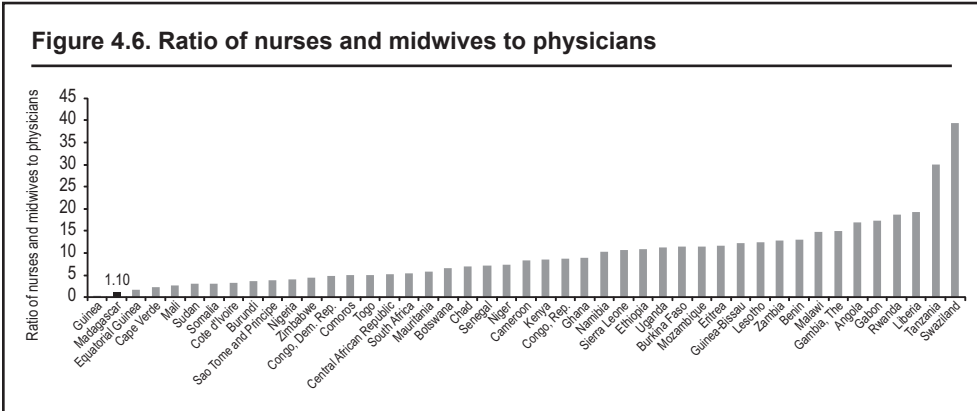
Community and traditional health workers (CHW) have a relatively small share in the Malagasy health system compared to other countries in the region. There are less than 1 CHW per 10,000 population, one of the lowest densities in Africa (Figure 4.7).



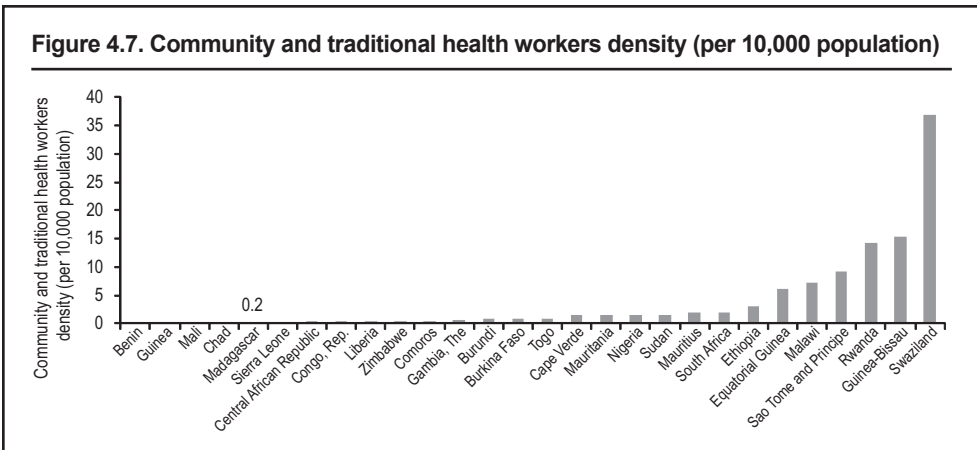
Source: World Development Indicators, 2010 graph represents the most recent health statistics for all available countries in Africa.



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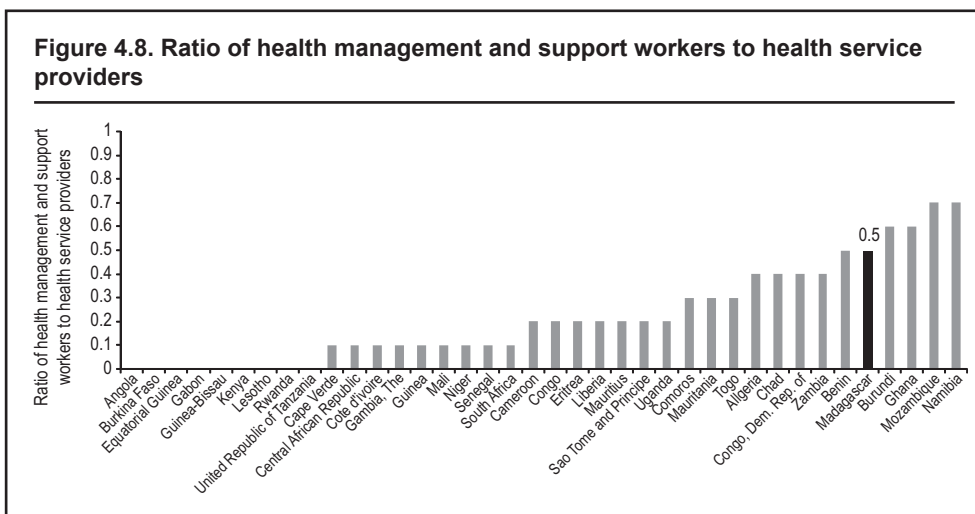
The proportion of health management workers in the health workforce is one of the highest in Africa. There is a 0.5 ratio of health management and support workers to health service providers, the fifth largest in Africa (see Figure 4.8). Although they are not responsible for providing health services directly, they are essential to the performance of the health system. Within the public system, regional health authorities are responsible for management and supervision of the District Health Authorities who are in turn responsible for supervision and monitoring of health centers within their catchment areas. There are 22 regions and 111 health districts with on average 30 health centers per district. District Health Authorities are generally expected to undertake quarterly supervision visits although this varies greatly by district, depending on accessibility and season.

No data is available on the number of medical personnel working in the private sector.

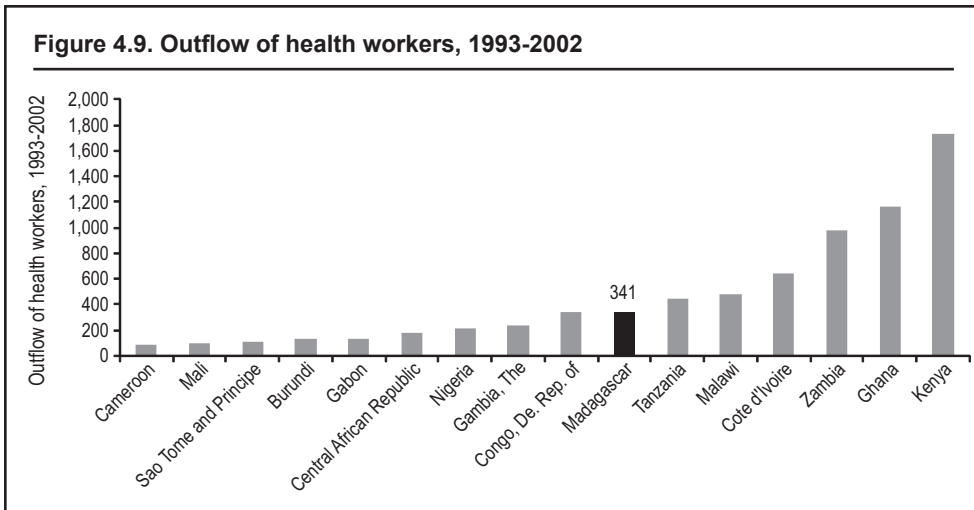
Health workforce exit is a moderate problem in Madagascar compared to other countries in the region. Between 1993 and 2002, it was estimated that 341 health workers (out of a total of 7,281 for 16 countries surveyed in Africa) emigrated abroad, mainly to France and to Zambia.⁶ This represents a small share in the Malagasy public sector health workforce, and it is a low figure compared to other countries in the region such as Tanzania, Zambia, Malawi, and Kenya (see Figure 4.9).

Despite a low HIV prevalence compared to other African countries, annual losses in the Malagasy health workforce due to premature mortality (under age 60) are comparable to other countries in the region. An estimated 21 physicians per 1,000 die annually under the age of 60, and an additional 20 nursing and midwives personnel per 1,000. The estimated average premature death rates in several countries surveyed in the Africa region are 24 and 21, respectively⁷ (see Table 4.3).

Anticipated retirements of health workforce will strain human resources going forward. Nearly half of the public health sector staff is over 50 years old and will retire in the next 10 years. This is expected to have a severe impact on the health workforce, which in turn will affect the performance of the system.



Source: WHO World Health Statistics, 2008; graph represents the most recent health statistics for all available countries in Africa.



Source: Survey on migration of health workers in the Africa Region. Brazzaville: WHO Regional Office for Africa; 2003.

Table 4.3. Estimates of annual losses due to mortality under age 60 among health workers in selected countries of the WHO Africa Region, based on life table analysis

Country	Premature death rate per 1,000 workers	
	Physicians	Nursing and midwifery personnel
Madagascar	21	20
Democratic Republic of Congo	23	19
Ethiopia	23	20
Kenya	23	23
Liberia	24	20
Tanzania	24	22
Central African Republic	25	21
Cote d'Ivoire	25	22
Rwanda	25	19
Sierra Leone	26	22
Uganda	26	22
Zambia	28	22
Total	24	21

Source: Handbook on monitoring and evaluation of human resources for health: with special applications for low- and middle-income countries.

Beyond the shortages in terms of numbers, there are major imbalances in the distribution of medical staff across rural and urban areas and across the various levels of service delivery. The current ratio of 1.05 health workers (doctors and paramedical staff combined) per 1,000 population is impacting access of the population, especially in rural areas, to basic health services. Significant percentages of health facilities operate below the Ministry's own technical norms and standards and cannot provide the minimum

package of services. Around 28 percent of doctors serve 75 percent of the population living in the rural areas and the remaining 72 percent serve the urban centers. With respect to service delivery levels, the study on emergency obstetrical and neonatal services revealed surpluses and deficits for the same specialty across service delivery levels. For example, while general practitioners are in surplus at the CHU level (162 extra doctors in the facilities surveyed), there are important shortages at the CHRR level (25 doctors), CHD2 level (22 doctors), and CHD1 level (77 doctors). The situation is similar for nurses. There are also laboratory technicians at the CSB2 level (11 technicians), where there is no need, while there is a shortage (29 technicians)⁸ at the CHU level.

The Ministry has not yet put in place a human resource tracking information system. Over the past four years, the Human Resources Department worked to develop a consistent and consolidated, routinely updated information system to keep record of public health providers and track their deployment across the country, however, there is no human resources information system that can track the skill-set of service providers.

Health workers are trained both in public and private facilities, and through coaching. All doctors are trained either at the University of Antananarivo or the University of Majunga, where approximately 200-250 new doctors graduate every year.⁹ Paramedical training for nurses, midwives, laboratory technicians, radiologists and others is offered at private facilities, such as the *Clinique des Sœurs St François d'Assise* in Antananarivo, SALFA managed by the Lutherans, and the *Institut de Formation des Paramédicaux* in Analamanga, Fianarantsoa, Tulear, Majunga, Tamatave and Diego. The training cycle is three years, is free and students receive an allowance of US\$40¹⁰ per month. For health management and support workers, in 2007 and 2008, MoH organized coaching in leadership and management courses. The objective of the sessions was to help the Ministry leadership team translate the directional guidelines emerging from the Sector Wide Approach discussions¹¹ into action aimed at achieving results and making real progress.

Salaries in the public sector are based on seniority whereas for private medical personnel they differ depending on qualifications, the kinds of specialized services available and location of facility. A doctor in the public sector earns an average monthly salary of US\$120, with increases of 10 percent every two years. A doctor at the same level in the private not-for-profit sector earns more or less the same salary, whereas doctors who work in the private for-profit sector can earn monthly anywhere between US\$250 and US\$1,250¹² depending on their qualifications and seniority, and whether they own the facility. Nurses and paramedical staff earn about US\$70¹³ per month in the public sector, and like the doctors, can earn up to five times more in the private sector. However, unlike other countries in Africa, the majority of the Malagasy doctors and nurses remain in-country, and only a small percentage that goes overseas to specialize tend to remain there.

Private Sector

Generally, private facilities fall into two categories: the not-for-profit managed by faith-based groups or NGOs and the for-profit health clinics managed by private individuals. All private health facilities, both at the primary and secondary level, are obligated by law to submit a request to operate to the *Direction des Soins de Santé de Base (DSSB)* of the MoH, following which the DSSB verifies the request, conducts an inspec-

tion of the health facility premises before providing a license to operate. This verification is jointly carried out with a representative of the Committee of the National Order of Doctors in urban areas, or with the district Medical Inspector in rural areas. Moreover, doctors wishing to establish a private practice must be registered with the National Order of Doctors. One of the key conditions for a new facility is that it must be situated at least 100 meters from the nearest neighboring health center.

Once operational, all not-for-profit primary health centers are required to adhere to the MoH norms and regulations, and must integrate their work programs into the district health planning. As is the case for public health centers, they are required to set quarterly targets in collaboration with the District Health Authority, submit monthly reports, and be regularly supervised by the district to ensure they are meeting their objectives. All not-for-profit health facilities are also authorized to be registered with SALAMA, enabling them to order drugs at subsidized rates. On the other hand, private for-profit clinics operate independently, and are not included in district health planning. It is also mandatory for all private referral hospitals to be registered with the DSSB, and receive a license to operate. Much like the primary health facilities, hospitals are also bound by law to adhere to MoH regulations, but only those related to human resources and equipment. They have more flexibility to design their own protocols of treatment and decide which types of care and treatment will be offered.

In addition to these two main types of private services (profit and not-for-profit), two other types of facilities exist: para-public and inter-enterprise. The first are those that are constructed and managed by large companies as part of their social responsibility to their staff members and their families. These include private health clinics, such as the clinic for the Air Madagascar staff, and Inter-Enterprise-funded Health Facilities (*Organisation Sanitaire Tananarivienne Inter-Entreprises* or OSTIE) that cater to the employees of different companies. Therefore, companies have a choice of either constructing and operating their own health facility or enrolling their employees with an OSTIE that already exists. These clinics are not included in the overall district-level planning, but are included in the district planning for preventive-care programs, such as immunization, family planning, and are involved in campaigns like the Mother and Child Health Weeks. The second type is para-public health facilities, which are attached to other Ministries, such as army clinics and hospitals. Even though these function outside the domain of the MoH, they are registered with SALAMA and have access to subsidized drugs.

Sector Monitoring

The Health Management Information System in Madagascar collects data on 74 indicators related to service provision as well as cost recovery from drug sales. The smallest data collection unit is the health center. Each month, health centers send activity reports to the districts that consolidate them from all health centers in their catchment area and send a summary report to the central health statistics service. At the health center level, data collection is on paper. However, all District Health Authorities have computer databases and routinely use them to send data to the central health statistics service, which then consolidates all data received from the districts, and makes this information available to program managers and policy makers.

Donor Coordination

The MoH has begun to put in place the necessary elements for an integrated sector wide approach to meet the challenges in the sector, the key anchors of which are the PDSSPS, the Medium Term Expenditure Framework (MTEF), and the Human Resource Development Plan. Since September 2007, the MoH has organized and led bi-annual health summits with the participation of all stakeholders (representatives from civil society, private sector, relevant ministries, and development partners), providing an opportunity to assess progress on the national program. Finally, Madagascar became a member of the International Health Partnership and related Initiatives (IHP+)¹⁴ in May 2008. IHP+ is expected to encourage greater harmonization among development partners and allow Madagascar to leverage additional donor resources. As a first step, a Memorandum of Understanding outlining the guiding principles of the sectoral approach was signed between the Government and 22 development partners in December 2008.

There is general consensus among the development partners that the sector is not quite ready for sectoral budget support given that the challenges in health continue to be too specific and the sector too fragmented. The World Bank's Independent Evaluation group (which completed a country assistance evaluation in July 2006 of IDA's involvement in Madagascar for 1995-2005) also recommended limiting the role of budget support until there is a sustained improvement in collecting and managing public resources. Therefore, many development partners in the health sector continue to earmark funds through specific financing instruments. Global budget support for the country is, however, provided by the European Union (EU), the African Development Bank (AfDB), the *Agence Française de Développement* (AFD), and the World Bank, which includes support to the reform agenda in the health sector. World Bank budget support is provided through the Madagascar Poverty Reduction Strategy Credit,¹⁵ which is the overall umbrella support to the implementation of the MAP and includes efforts to improve the overall institutional setting for service delivery in health, nutrition, and other social sectors (education, water and sanitation).

Quality of Services

Indices of the quality of services provided are hard to obtain without in-depth studies of health centers. Trends in these indices are even harder to identify since most of the available surveys are ad-hoc. Nevertheless, this section focuses on five dimensions of quality that reflect major health system issues: (i) infrastructure quality and staffing distribution, (ii) availability of drugs at the public health center's pharmacy, (iii) compliance with diagnostic procedures for outpatient visits, (iv) quality of ANC visits, and (v) frequency and quality of supervisions.

Infrastructure Quality and Staffing Distribution in the Public and Private Sector

According to the 2005 EEEFS facility survey, overall public health facilities were in a worse state than the private ones. Public buildings (ceilings, walls, and floors) and medical equipment (examination tables, etc) are in a poor state. Only 83 percent of public facilities have access to running water, 54 percent to electricity, and 51 percent have a medium of transportation. Results are driven by poor conditions of rural public health facilities. Almost all private health facilities have access to running water and electricity (97 percent and 96 percent respectively), but only 44 percent have access to a functional

medium of transport. While in large urban centers there are no important differences between health facilities, public facilities in secondary urban centers have slightly poorer access to electricity, and rural public facilities are in a worse state than their private counterparts (Table 4.4). Only 33 percent of rural public health centers have access to electricity compared to 89 percent and 85 percent for non-faith-based and faith-based health centers respectively.

Table 4.4. Infrastructure quality of health centers in 2005 (percent of surveyed centers)

	Water	Electricity	Transport	Sample size
Large Urban				
Faith-based	95.6	100.0	56.5	23
Non-faith-based	100.0	100.0	41.9	31
Public	100.0	93.3	43.3	30
Secondary Urban				
Faith-based	91.3	100.0	30.4	23
Non-faith-based	100.0	92.9	42.9	14
Public	88.9	81.5	44.9	27
Rural				
Faith-based	94.4	88.9	50.0	18
Non-Faith-based	100.0	84.6	46.2	13
Public	76.0	33.3	55.2	96
Total				
Faith-based	93.7	96.9	45.3	64
Non-faith-based	100.0	94.8	43.1	58
Public	83.0	53.6	51.0	153

Source: EEEFS 2005 (WB calculations, unpublished data).

The health care personnel to patient ratio reported from the 2005 EEEFS is also worse in the public sector than in the private sector, except in the large urban centers (Table 4.5).

Table 4.5. Health care personnel to patient ratio in 2005

	Average ratio (population assisted per health staff)	Sample size
Large Urban		
Faith-based	300.9	17
Non-faith-based	295.7	26
Public	213.9	28
Secondary Urban		
Faith-based	235.7	11
Non-faith-based	171.4	14
Public	311.0	26
Rural		
Faith-based	231.3	6
Non-Faith-based	170.1	9
Public	300.3	81

Source: EEEFS 2005 (WB calculations, unpublished data).

In general, in public health centers in rural areas, one health professional¹⁶ assists around 301 patients monthly, while in the private sector there is one health professional for 231 patients in faith-based health centers, and one for 170 in non-faith-based health centers. Similar rates have been observed in health centers in secondary urban areas. However, public health centers in urban areas are better staffed, and a public health service provider attends 214 patients a month on average, while private health centers average 300 patients per provider.

Box 4.1. Quality of infrastructure affecting maternal and neonatal health

Obstetrical and Neonatal Emergency Services

Madagascar lacks adequate Emergency Obstetrical and Newborn Care (EmONC) services. For the mother, Basic Emergency Obstetrical and Newborn Care (BEmONC) services include antibiotic injections and oxytocic drugs to prevent postpartum hemorrhage, anticonvulsive drugs, manual removal of the placenta, and manual vacuum extractor or forceps for assisted vaginal delivery. For the newborn, BEmONC includes pre-referral intensive care (heating, nasal passage clearing, cardiac massage, ventilation), and care for newborns with low birth weight, respiratory distress, infection or anemia. Referral hospitals should have the necessary infrastructure to offer Comprehensive Emergency Obstetric and Newborn Care (CEmONC) services, which include blood transfusion, laparotomy, and caesarean section for the mother, and mechanical ventilation, blood transfusions and services for congenital malformations for the newborn.

The international norm is five BEmONC health centers per 500,000 population with at least one CEmONC health center, while the ratio in Madagascar is 0.5 and 0.1, respectively. In Madagascar, there are 19 health centers offering BEmONC and 3 CEmONC. There is a need for an additional 152 health centers providing BEmONC and 20 health centers providing CEmONC.

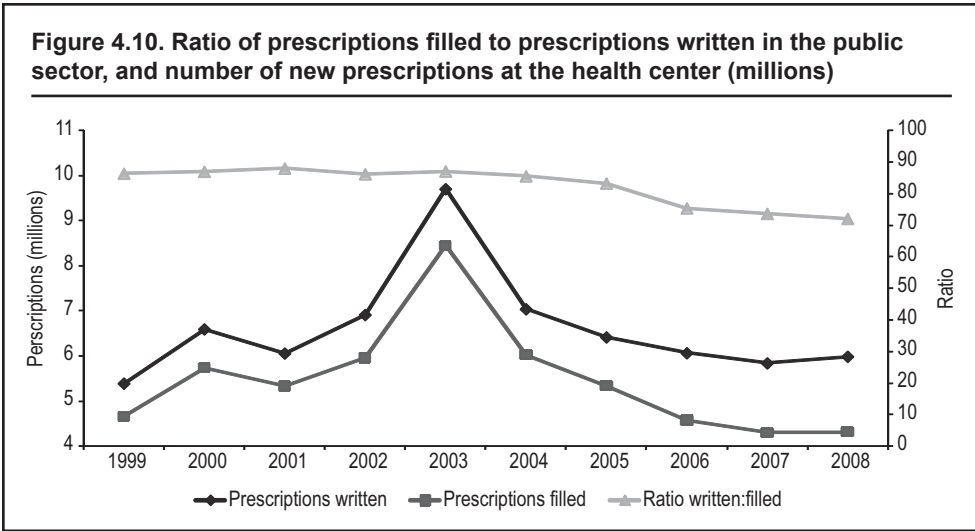
However, even the existing centers are unable to provide services of quality due to facility conditions and lack of necessary equipment. For example, 44 percent of hospital centers and 56 percent of basic health centers do not have sufficient lighting to perform services at night. Moreover, only 39 percent of health centers have the catheters necessary for blood transfusions. The diagnostic and monitoring equipment is rarely available: 25 percent of health centers have an ultrasonograph, 15 percent have a heart monitor, and 12 percent have an oximeter. Furthermore, only 21 percent of centers had delivery kits available (30 percent of CSBs and 11 percent of hospitals).

For the delivery of CEmONC, 89 percent of centers have a laboratory, 71 percent of which are adequate for blood transfusion; however, only 43 percent have blood available for transfusion. Surgery blocs are available in 59 percent of hospitals but only 14 percent of them are being used for obstetrical services. Only 50 percent of hospitals have cesarean kits.

Source: Vice Primature Chargée de la Santé Publique. (2010). Evaluation des besoins en matière de soins obstétricaux et néonataux d'urgence à Madagascar. Antananarivo, Madagascar.

Availability of drugs

Availability of drugs in the system is poor and declining. There is one quality index that is a less than ideal proxy but for which time series are available (compiled routinely by MoH): the ratio of prescriptions filled to the prescriptions written in the public sector. Figure 4.10 depicts the national trend since 1999. The peak in prescriptions written and filled corresponds to the period when user fees were lifted and drugs were made available for free in 2003. Since 2004, the absolute number of prescriptions written has been steadily declining (MoH re-imposed user fees in January 2004); however, there is an even sharper decline in prescriptions filled. During the same period, however, the utili-

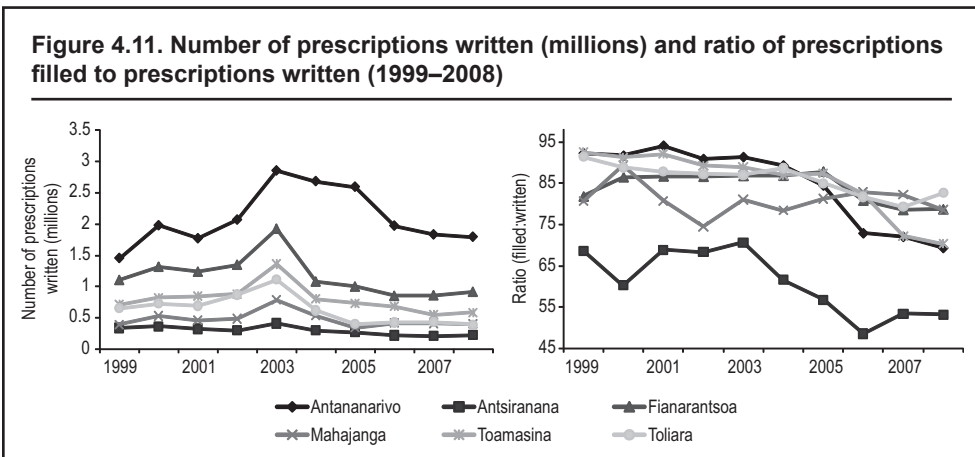


Source: MoH, SISG.

zation ratio stayed the same. In other words, it became increasingly difficult for patients to find prescribed drugs at the public pharmacy.

Another possibility for the increasingly wide gap between prescriptions filled and prescriptions written is the affordability of the prescribed treatment for the patient. If the drugs are indeed available but the patient cannot afford to purchase them, the prescription will not be filled. More studies are necessary to disentangle these two possibilities.¹⁷ Moreover, since during the same period (2004–2008), the number of new consultations at public health centers remained constant while the number of prescriptions written significantly declined, it is likely that doctors failed to even prescribe the necessary medication in the knowledge that drugs were out of stock. In such a scenario, the quality index would underestimate the true situation.

There are some regional variations, however, throughout the country and the quality of the drug supply has deteriorated in the past ten years. Regional trends are depicted in Figure 4.11. The most severe decline in quality occurred in Antananarivo,



Source: MoH, SISG.

where in 2004, more than nine in ten prescriptions were filled at a public health center's pharmacy, but by 2008, only seven in ten were filled demonstrating the second to worst performance across regions. A similar decline occurred in Tuléar, the percentage of prescriptions filled falling from 87 percent to 70 percent between 2004 and 2008. While the public sector experienced a quality decline, some prescriptions may have actually been filled in the private sector. In Antsiranana, the situation was particularly worrisome since barely one in two prescriptions were being filled at the public pharmacy.

The suspension of user fees between September 2002 and December 2003 negatively impacted the availability of drugs in the system. The gratuity of health services resulted in a lagged increase in utilization of outpatient services, which put pressure on the supply chain for drugs which was ultimately unable to meet this demand. (See Box 4.2 below for a detailed analysis.)

The poor quality of the pharmaceutical supply in Madagascar has also been addressed in the recent Service Delivery Study¹⁸ that collected data on availability of drugs both at the periphery level (Community Pharmacy) indicating the direct availability to users, as well as at the district level (District Pharmacy) measuring the availability in the health system (Table 4.6).

Table 4.6. Availability of selected drugs (in percentage) as reported in November 2006 and in May 2007¹⁹

	Available at the time of the visit November 2006 (rainy)/May 2007 (dry)	
	Community Pharmacy	District Pharmacy
Aspirin	66/59	82/82
Paracetamol	93/91	100/100
Antibiotic cotrimoxazole	95/96	100/96
Antibiotic amoxicillin	88/90	96/96
Iron, folic acid	83/79	89/89
Retinol (vitamin A)	69/69	71/68
Oral rehydration salts	68/89	57/89

Source: PETS 2006/2007.

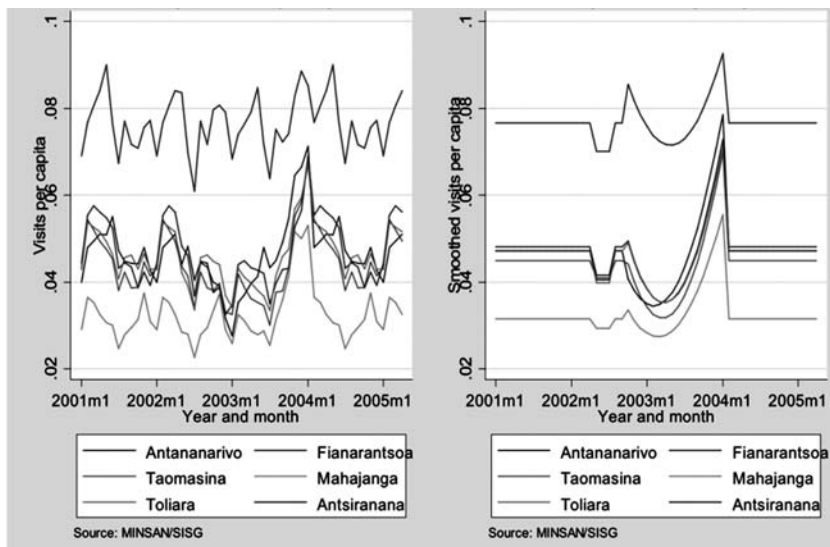
When the surveys were fielded, **not one health center reported a full stock of drugs, and the most acute shortages were for anti-inflammatory drugs, vitamin A, and ORS** (more than three out of ten health centers visited did not have them in stock). While only a few health centers experienced stock-outs (measured by unavailability of a drug for more than 30 consecutive days), their duration was alarmingly high: the median number of stock-out days was as high as three months.

Counterintuitively, there were no meaningful differences between the dry and the rainy seasons, indicating that the problem is not necessarily linked to issues of seasonal isolation of health centers from district pharmacies, but in fact linked to systemic failures in management of stock and distribution logistics between district pharmacies and central SALAMA. Drugs that were available at the district also have higher availability rates at the health center. This suggests that policies should focus first and foremost on ensuring that the needed drugs are available at the district level.

Box 4.2. Response of the public to suspension of user fees (2001-2004)

After the 2001/2002 crisis, during which health care utilization and quality both declined, user fees were suspended in the public facilities for a period of 16 months, from September 2002 through December 2003. MoH data track the history of outpatient visits from January 2001 and through the period of free drugs. The figure below highlights the impact of the crisis (an initial dip in utilization followed by a brief recovery), and the period of free drugs (a J-shaped pattern). The left panel shows the partially smoothed data, while the right-handed panel shows the same data after smoothing over the monthly pattern.

Figure B4.2.1. Impact of crisis and fee suspension on outpatient visits per capita, 2001-2004 (smoothed data and smoothed monthly pattern)



Utilization of public health services declined during the 2002 crisis, then, with a lag of three months, utilization increased to higher levels during the period of free care, and finally declined to pre-crisis level when the user fees were re-installed. The estimation shows that per capita utilization was highest in Antsiranana, while lowest in Majunga. The other four provinces had very similar per capita patterns, which lie in between these two extreme provinces. In all provinces, except Majunga, utilization fell steeply during the crisis, in the middle of 2002. Following the crisis, the new President declared a suspension of user fees; however, utilization continued to decline for several months. Then in February/March 2003, utilization turned around and began to increase until it was substantially higher than prior to the crisis. When user fees were backer-introduced in January 2004, utilization fell precipitately back to the former levels.

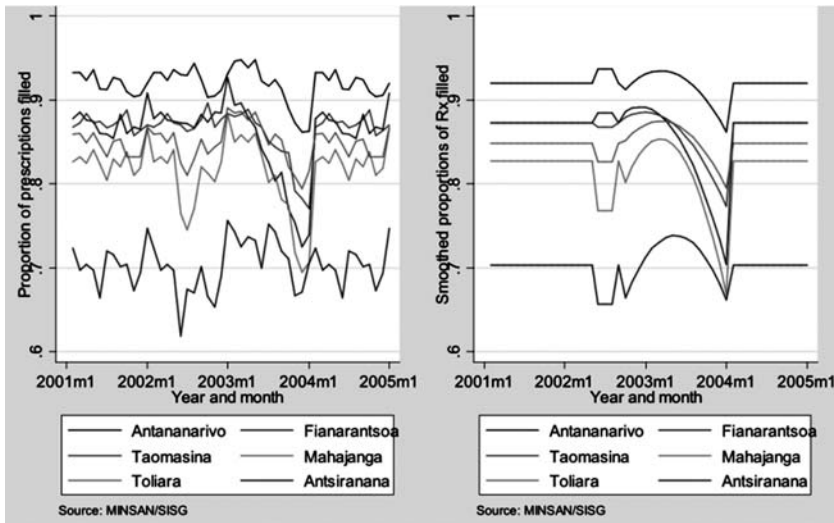
The trend in the proportion of prescriptions filled decreased during the crisis, and then briefly increased, however it sharply decreased during the suspension of user-fees. During the political crisis, when utilization fell, the proportion of prescriptions filled also decreased (see Figure B4.2.2 below). It seems likely that reduced mobility interfered both with patient access to facilities and with replenishment of health center drug stocks from SALAMA. The progression of this quality index (proportion of prescriptions filled) over the period that drugs were free shows an interesting curve that is the opposite of that shown for utilization. The proportion of prescriptions filled increased soon after the suspension of user-fees, presumably indicating that the public was more willing to stop by the pharmacy to pick up the prescribed drug when it was free.

(Box continues on next page)

Box 4.2 (continued)

Then, as utilization increased during the period of free care, it became increasingly difficult for patients to find a drug at the pharmacy and this index of quality plummeted. By the end of the period of free care, utilization was very high, but the proportion of prescriptions filled had fallen to the lowest levels experienced thus far in each province. A consistent interpretation is that some patients were forced to return to the health center several times in order to fill their prescriptions. This would have the double effect of increasing apparent utilization, while decreasing the percentage of prescriptions filled.

Figure B4.2.2. Impact of the crisis and fee suspension on prescriptions filled in the public sector, 2001-2004 (proportion of prescriptions filled smoothed data, and smoothed monthly pattern)



The re-introduction of user-fees brought the proportion of prescriptions filled back to its pre-crisis levels. In response to this increasingly chaotic situation, the Government re-imposed the user fees in January 2004. Subsequent data shows a brief return in each province to the pattern of prescriptions filling existing prior to the political crisis.

The re-introduction of user-fees did not affect children immunization visits, normal deliveries, and prenatal care consultations; however, it had a negative effect on important surgical interventions, c-sections, and laboratory tests. To estimate the impact of the user fee on utilization of health services, a commune survey was carried out in 2004 after the re-introduction of user fees, the methodology of which was similar to the 2002 commune survey conducted during the user fee suspension period. This allowed for a comparison of services provided between these two periods. The analysis revealed that although there was a sharp decrease in health services provided after the re-introduction of user fees, not all services were affected. Children immunization visits increased by 26 percent. However, important surgical interventions, C-sections, and lab tests decreased considerably; the levels in 2004 were at 12 percent, 13 percent, and 22 percent compared to the same period in the earlier year (2003=100 percent). Hospitalizations, curative consultations, and small surgical consultations also decreased, but normal deliveries and prenatal care remained relatively unchanged. Financial accessibility was the main reason perceived (according to the facility survey) for the decrease in visits, while an improved quality of care was the major perceived reason for increases in service utilization.

Source: Analysis of the impact of user-fee suspension is by Mead Over for the *Health Sector Note*, May 2005 (restricted distribution copy) and the analysis of the impact of re-introduction of user-fees is based on "Dynamics in social service delivery and the rural economy of Madagascar: descriptive results of the 2004 commune survey."

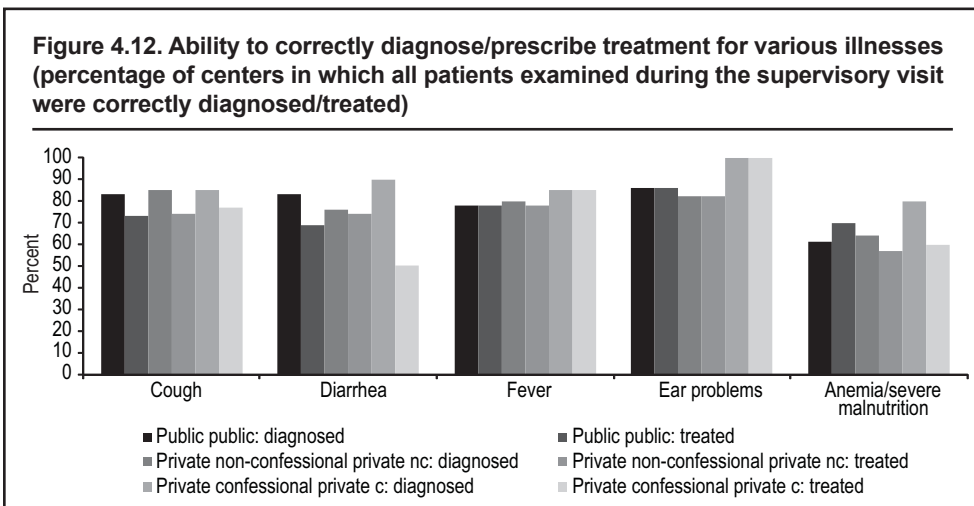
The Service Delivery Study revealed that it takes approximately one month between the time when districts place their orders with SALAMA and actual delivery to the District Pharmacy. Orders follow a four-step process: (i) the District Pharmacy obtains permission for the order from the District Health Authority which can take up to four days; (ii) the purchase order is mailed to SALAMA which issues an invoice for the order, taking a further 12 days on average; (iii) the invoice is paid by check, adding four days to the process; and finally, (iv) drugs are sent to the District Pharmacy and generally arrive within 12 days of the received payment.

The analysis of the bottlenecks in the drug supply chain also revealed that leakages of drugs exist at both the district and health facility level. Almost three out of four (73 percent) of surveyed commune pharmacies reported a leakage in the drug supply chain from district to their level. This problem is most severe for antibiotics, but it affects all drugs. A key finding is that health centers in communes that do not pay regularly their *dispensateurs* (community pharmacy staff responsible for management of supply and filling the doctor’s written prescriptions) tend to experience more leakages. The *dispensateur* and the guard are paid by the commune out of a subsidy from the Government. The timely payment of the salary is crucial to ensure effective functioning of the pharmacy.

Provider Performance

Another dimension of quality of services is the performance of the provider. Performance of medical staff is difficult to assess and surveys that do so are uncommon. It can either be done through ‘mystery patient’ surveys or through direct evaluation by a medically trained observer. During the 2003 EEEFS, a medically trained observer attended the consultations and reported whether the illness was diagnosed correctly and whether the patient was prescribed the treatment corresponding to the identified illness.

There are no significant differences between the public and private (faith-based and non-faith-based) health centers in diagnosis performance. In more than eight out of ten centers, all patients that had problems related to cough, diarrhea, and fever, were diagnosed correctly during the supervisory visit. However, in four out of ten public and private non-faith-based centers, not all patients were correctly diagnosed for anemia or severe malnutrition (Figure 4.12).



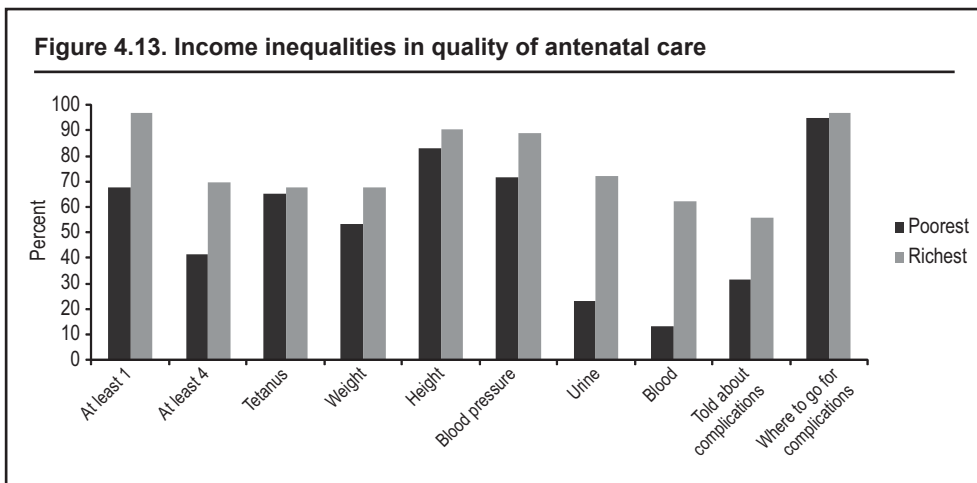
Source: EEEFS, 2003.

Correct diagnosis of malnutrition and anemia is of concern across all centers. The procedure for diagnosing severe malnutrition involves calculating the ratio of weight to height. Since not all centers have a scale available, a standard bracelet can also be used to diagnose malnutrition in children by measuring the arm circumference. In cases of severe malnutrition, patients must be referred to one of the Intensive Nutrition Recovery Centers at the hospital level. However, in only six out of ten private centers was the referral actually recommended. Public centers referred patients with severe malnutrition more consistently (seven out of ten centers correctly referred all patients, which corresponds to a 10 percentage points increase).

Quality of Health Services Provided

In general, the quality of health services accessed by the poor in Madagascar is worse than the quality of care received by the better-off. While antenatal visit differentials, between urban areas (95 percent in the capital and 90 percent in other urban areas) and rural areas (78 percent) or between the richest quintile (97 percent) and the poorest (68 percent), are relatively smaller than for other health indicators (as described in Chapter 2), the *quality* of antenatal care actually varies substantially with location, poverty and education.²⁰

For instance, the quality of visits, as measured by whether blood and urine tests are provided, are greatly correlated with income and location; a pregnant woman from Antananarivo has significantly better access to the necessary health services than one in the countryside. Moreover, inequalities occur not only for preventive interventions that require access to laboratories, or depend on availability of supplies at the health centers (balance for weight measurement, tape for height measurement); variations also exist for the provision of basic information, such as whether or not pregnant women are made aware of the signs of potential complications. Most pregnant women know where to go in cases of emergency, but they do not know how to recognize signs of complications (Figure 4.13).



Source: DHS 2003.

*ANC1 and ANC4 represent percentages of all pregnant women, while the other indicators are percentages of the subset of women who attended at least 1 ANC visit.

Moreover, women with no education (who are also less likely to know this from other sources) receive less information about potential complications and their symptoms than women who completed their primary or secondary/higher studies (24 percent, 34 percent and 50 percent respectively were told about signs of pregnancy complications during ANC visits). This differential also exists across wealth groups (32 percent for the poorest vs. 56 percent for the richest), and across locations (60 percent in the capital, 45 percent in other urban settings, and 34 percent in rural areas).

Poor quality outcomes of health services are mainly attributable to a few specific health centers, as suggested by the 2003 EEEFS. As shown in Table 4.7, the majority of health centers did comply with the existing protocol for ANC visits. Centers were evaluated according to three criteria: (i) whether every woman was asked about prior pregnancies, abortions, or still births, (ii) whether five critical elements were available at the time of the consultation (health card, age, weight, blood pressure, and height), and (iii) whether the three components of a ANC visit were performed (fundal height measurement,²¹ fetal heart rate monitoring, and vaginal exam). There were no differentials across type of centers. The situation however is likely to have deteriorated since 2003. World Bank supervision missions in recent years highlighted that most health centers do not have this information recorded for the registered pregnancies, and that many health center personnel are unable to identify the main components of an ANC visit.

Table 4.7. Number of health centers that complied with existent protocol for ANC visits

	Asked about outcome of prior pregnancies	Availability of information	Completeness of ANC exam
Public	62 of 64	62 of 64	58 of 64
Private non faith-based	11 of 14	12 of 13	12 of 13
Private faith-based	6 of 6	6 of 6	5 of 6

Source: EEEFS 2003.

The discrepancy in the results of the household survey (DHS 2003—many poor households receiving poor quality care) and the facility-based survey (EEEFS 2003—few facilities delivering poor quality care) suggests that poor quality of services outcomes are attributable to a few health centers that disproportionately serve economically disadvantaged and rural communities.

Quality of services provided in the private sector is also of concern since there is no national policy to effectively engage the private facilities in achieving the Government's health objectives. Even though private clinics are required to be registered, they are not always managed by qualified health personnel, and there is insufficient government supervision to assess whether services are provided in accordance with the national guidelines and protocols. Data made available to the Government from the private sector is scant and not well documented.

Health Personnel Supervision

Quality of care is very much influenced by the frequency and quality of supervision. The 2005 wave of EEEFS showed that 86 percent of public health centers were supervised at least once within six months preceding the survey and 51 percent in the preceding month (Table 4.8).²² There were no major differences across urban/rural settings.

Table 4.8. Supervisory visit frequency and quality for public and private health centers (percentage of total health centers that responded)

	Public health centers		Private health centers	
	Frequency	Motivation*	Frequency	Motivation*
Over the last 4 weeks	51.0 (n=78)	97.4	18.0 (n=22)	100
Over the last 2 to 6 months	35.3 (n=54)	98.1	32.0 (n=39)	89.7
More than 6 months ago	13.1 (n=20)	88.2	50.0 (n=61)	79.3
Never	0.7 (n=1)	100	—	—

Source: EEEFS 2005.

* The question posed to the health center's personnel in charge is "Does such a visit motivate you"

Supervision is lagging in the private sector. The share of institutions visited at least once in the six months preceding the survey was only 50 percent in the private sector. The benefit of the visit is very apparent, as indices of staff motivation tend to decline significantly with the decline in frequency of supervision visits.

Regular supervision of health centers is essential to ensuring that staff are motivated and deliver quality services. Supervision visits provide the opportunity to monitor and assess the quality and availability of equipment, drugs, supplies, and health center infrastructure, including management of medical waste; they should include a direct evaluation of clinical examinations and procedures, procedures related to prevention of infections, as well as of counseling techniques used by the health center staff and appropriate feedback. Such supervision ensures that all services provided by the health centers are in line with the national protocol and that bottlenecks are addressed in a timely fashion. As a result, one would expect to see a strong correlation between supervision and quality of care.

Surprisingly, the EEEFS 2003 data²³ showed a negative association between the number of supervisory visits and the quality of services and productivity of personnel once other variables are taken into account. Potential explanations include the possibility that supervision was poorly carried out or, more likely, that supervisors actually targeted the worse performing facilities. Untangling these two possibilities would require further data collection and analysis.

Notes

1. National Household Survey, 2005.
2. Surgery, management of complicated cases, and laboratory, X-ray and ultrasound services.
3. Health Map 2007 identifies two university hospitals but two have been added since: Fianarantsoa and Tamatave.
4. While according to the Carte Sanitaire 2007, there are 2,593 CSB I and II, in fact 93 of those are operating under different Ministries (such as Defense).
5. Around 6 percent.
6. Africa Regional Health Report: WHO Regional Office for Africa, 2006.
7. Dal Poz, M. R., Gupta, N., Quain, E., & Soucat, A. L. (2009). *Handbook on monitoring and evaluation of human resources for health: with special applications for low- and middle-income countries*. World Health Organization, World Bank, and United States Agency for International Development.
8. Vice Primature Chargee de la Sante Publique. (2010). *Evaluation des besoins en matiere de soins obstetricaux et neonatals d'urgence a Madagascar*. Antananarivo, Madagascar.
9. Specific data on how many of these new graduates enter the public or private sector is not available.

10. Ariary 80,000.
11. Sub-section 6 provides detailed information about the Sector Wide Approach.
12. Ariary 0.5 million to Ariary 2.5 million.
13. Ariary 140,000.
14. "IHP+ builds on the existing global framework of development assistance that has emerged over the past decade, which commonly calls for the need to rationalize the health architecture and change the way donors work together with partner countries through coordinated efforts of national governments, international agencies, bilaterals, regional governing bodies, civil society, foundations, and the private sector, as well as the need to strengthen in-country health system services" (www.internationalhealthpartnership.net/).
15. The fifth Poverty Reduction Support Credit, a US\$50 million project, was approved in June 2008, became effective in July 31, 2008, and the closing date was July 31, 2009.
16. Qualified health professional including birth-attendant.
17. There is yet another possibility: doctors prescribing treatment/drugs that are not available at the public pharmacy but only in the private sector. In Madagascar, private pharmacies, pharmaceutical firms, and wholesalers reward doctors prescribing specific brands.
18. Sharp, M. and Francken, N., *Service Delivery in the Education and Health Sectors in Madagascar*, Draft 2009.
19. Amoxicillin is used mainly for ear, nose, and throat infections; cotrimoxazole is prescribed for bacterial infections of the gastrointestinal tract; iron and folic acid supplement is administered to pregnant women at the ANC visit; vitamin A supplement to children is administered twice a year during the semiannual *Mother and Child Health Week* since November 2006; ORS is also available at the community level over the counter at the local *épiceries*.
20. DHS 2003.
21. A tape measurement of the distance from the lowest to the highest part of the uterus that is used by the caregiver in combination with abdominal palpitation to assess the baby's size and position, the quantity of fluid around the baby and to diagnose multiple pregnancies.
22. More recent data is available from the two waves of PETS (2006 and 2007), which survey 113 public health centers. The results confirm the results from the EEEFS 2005 (84 percent of surveyed health centers were visited between June 2006 and November 2006, and 71 percent between December 2006 and May 2007). Although the results are more recent the surveys did not collect data on private facilities and thus the EEEFS 2005 was deemed more informative.
23. Mead Over and Wally Wane analysis of the 2003 EEEFS data, unpublished.

Sector Financing

Globally, there exists an enormous mismatch between countries' health financing needs and their current health spending; however, efforts have been made by the international community to increase funding for health. Developing countries account for 84 percent of global population, 90 percent of the global disease burden, yet only a mere 12 percent of global health spending. The poorest countries bear an even higher share of the burden of disease and injury, however, have the fewest resources for financing health services and needs. International recognition of these global health inequities by the international community as well as global public health threats and the failure of many countries to reach the MDGs, have sparked significant increases in funding for global health, after almost a decade of decline in the 1990s.¹

However, more donor aid alone will not necessarily lead to better results. Despite improvements globally in access to health care services, implementation bottlenecks, such as the macroeconomic realities affecting domestic resource availability, the quality of governance, institutional capacity, and health systems-specific impediments inhibit the effective, efficient, and equitable use of development aid for health.² In the case of Madagascar, the country faces major disease burdens from preventable and treatable communicable and non-communicable diseases, while funding for the health sector is constrained by a small resource envelope and unpredictable donor aid. Additionally, the health sector itself faces challenges in targeting available resources to where they are most required, putting in danger both equity and financial sustainability of the sector.

The public expenditure review in this section constitutes an opportunity to examine the efficient and effective use of domestic and external resources in the health sector in Madagascar prior to the 2009 crisis. This chapter seeks to examine how public expenditures of the MoH are used in broad terms and reviews equity and risk pooling of health spending as well as efficiency issues. To this end, the first section provides an assessment of MoH's budget by sources of financing, examines the composition of the budget and spending patterns and identifies budget management issues related to the sector's absorption capacity. The public expenditure assessment is complemented by the second and third sections that focus on equity aspects and financial protection schemes as well efficiency of Madagascar's health expenditures. The following section then examines Government's means to create additional fiscal space for the health sector. The final part of the chapter seeks to examine the potential impact of the political crisis on the health sector.

Financing of the Health Sector

Given that the bulk of the public funds (around 80 percent of all public health expenditures) are managed by the MoH, the following expenditure review focuses on budget-

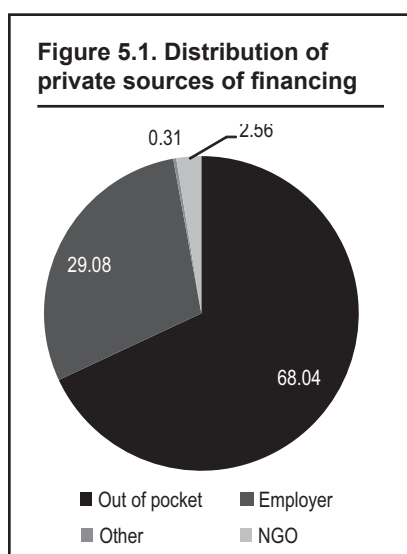
ary allocations and actual spending of the MoH. The analysis is based on 2008 data and information from the integrated financial management system of the Ministry of the Finance and Budget (MFB) and data from the 2003 and 2007 National Health Accounts (NHA), in particular for the sources of health spending as well as spending by function.

Sources of Financing

In Madagascar, public funds represent account for half of the financing of the health system, followed by private and donor funds. The 2007 NHA estimated that public funds account for 49 percent, private funds for 34 percent of sector financing and the donors contributed only around 17 percent to the sector. The composition of sources of funding has significantly fluctuated since 2003 when the first NHA study was carried out in Madagascar. At that time, donor funds accounted for the largest source of finance for the health system (37 percent), followed by the public (32 percent) and private (31 percent) funds. However, this may also be attributed to the different methodologies adopted for the two sets of NHA. In 2007, salaries were included in the study, whereas they were not in 2003. The mix of the sources of financing has many implications for the sector, particularly in terms of access, equity, efficiency, and financial sustainability.

The dependency of the sector on donor aid has improved since 2003, and is in line with other African countries. Madagascar was among the countries with the highest ratio of external assistance and expenditures (around 42 percent according to NHA 2003) if compared to other African countries, such as Mali, Mozambique and Tanzania that had on average an external assistance/expenditure ratio of around 24 percent.³ However, according to the 2007 preliminary NHA data, this dependency has decreased to about 20 percent.

Out-of-pocket payments for both public and private facilities are the main source of private financing. The importance of out-of-pocket spending in private spending (68 percent) is an indicator of potential inequities in the health system, given poor people’s limited ability to pay and their lack of participation in risk pooling mechanisms. Pre-payment mechanisms only cover a small proportion of formal sector workers and do not comprise an important part of private financing (Figure 5.1).



Source: NHA 2007, preliminary results.

Trends in the Health Sector Budget

Budgetary allocations to the MoH have increased but remain below the sector’s needs and international standards. Budgetary allocations to the MoH have increased in real terms (by 11 percent between 2004 and 2009), and as a share of the budget over the past years 2005-2008 (Table 5.1). Economic growth and a renewed focus on the social sectors have led to real increases in the level of resources for the health sector. However, despite these increases, the Ministry’s 2009 budget (amounting to US\$168 million or 9 percent of the total national budget) was still only half of what was needed to finance all the interventions inscribed in the PDSSPS 2007-2011, estimated at US\$330 million for 2009.⁴

Notwithstanding increases in allocations, the resources also remain insufficient to achieve the MDGs and fulfill recommended WHO standards. Preliminary results of the MTEF 2009-2011 show that, prior to the 2009 crisis, an additional US\$7 per capita was required for 2009-2010 and US\$8.10 per capita for 2011-2012 to sustain progress in achieving the MDGs.⁵ More resources are, in particular, needed to address the overcrowding of hospitals and shortages of health personnel that continue to place serious constraints on the accessibility and quality of services.⁶

Table 5.1. Evolution of MoH's budget and actual spending 2004-2009

	2004	2005	2006	2007	2008	2009
MoH Allocation (in billion Ariary)	99.4	144.7	167.8	198.7	256.0	329.5
Share of the National Budget (%)	5.9	6.7	6.4	7.1	8.3	9.1
Share of GDP (%)	1.2	1.4	1.4	1.4	1.6	1.8
Real Growth (%)		23.6	4.0	8.3	17.5	19.7
Actual spending of MoH budget (on commitment basis)	142.0	69.1	120.3	145.9	176.4*	
Share of the National Budget (%)	7.6	3.7	5.1			
Share of GDP (%)	1.7	0.7	1.0			
Memo						
National Budget (LFR)	1,699.0	2,151.0	2,602.2	2,800.3	3,073.9	3,630.3
National Budget (commit. Basis)	1,870.6	1,873.1	2,366.7	n.a.	n.a.	
GDP deflator (base year 2003)	14.3	17.8	11.5	9.3	9.7	7.5
Nominal GDP (in billion Ariary)	8,156	10,096	11,815	13,834	16,234	18,731
Exchange rate (Ariary per US\$, annual average)	1,871	2,003	2,143	1,874	1,780	1,980

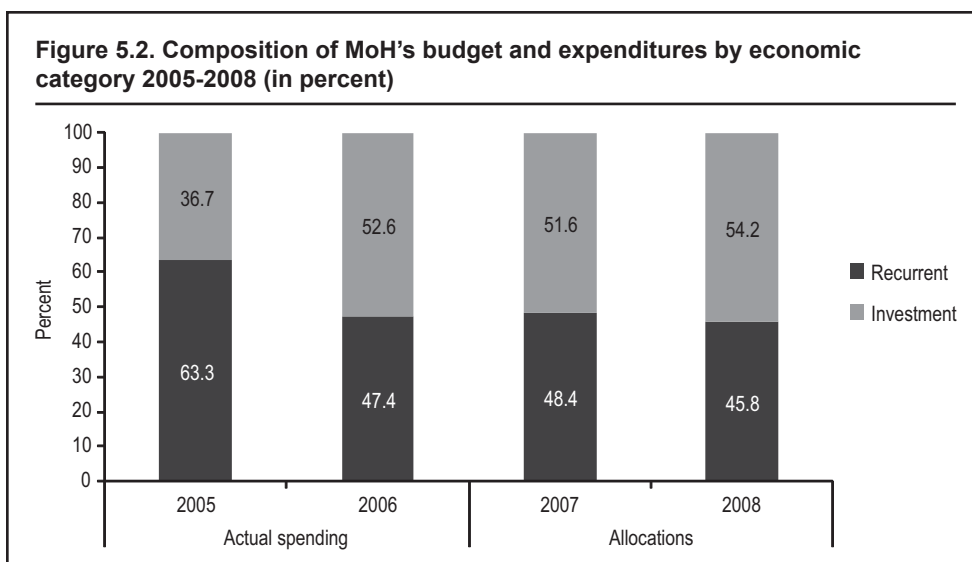
Source: Estimates from MFB, International Monetary Fund and WB.

*Based on provisional figures provided by the MFB (April 2009).

While the overall level of budgetary allocations is low, a key challenge for the MoH is the low level of spending. According to the 2007 preliminary NHA, total health expenditures per capita for Madagascar represented about US\$18.50 in contrast to an average for Sub-Saharan Africa of US\$12.90.⁷ Although, this is a substantial increase from the 2003 levels of US\$11.90, Madagascar still spends far less than the recommended WHO standard of US\$34–US\$40 per capita required to provide essential health services.⁸ Taking a closer look at the low level of spending on health in Madagascar, Table 5.1 shows that this is in fact a problem of absorption capacity as the actual spending is far below the allocated budget. While the MoH is the fourth largest ministry after the Ministry of Education (accounting for 17.7 percent of the national budget), the MFB (16.8 percent) and the Ministry of Public Works and Meteorology (10.2 percent), it is among the ministries that spends the least compared to the other key sector ministries.⁹

Composition of the Health Budget

Assessing the composition of the budget, the non-salary recurrent budget continues to be insufficient, affecting service delivery quality and sustainability of the investment program. The composition of the budget in terms of actual spending and allocations in recent years suggests that, with the exception of 2005, the recurrent/investment ratios tend to be slightly more in favor of investment programs (Figure 5.2).¹⁰ Within the recurrent budget, salaries constitute the largest item, amounting to 58 percent of the recurrent budget in 2008.



Source: MFB.

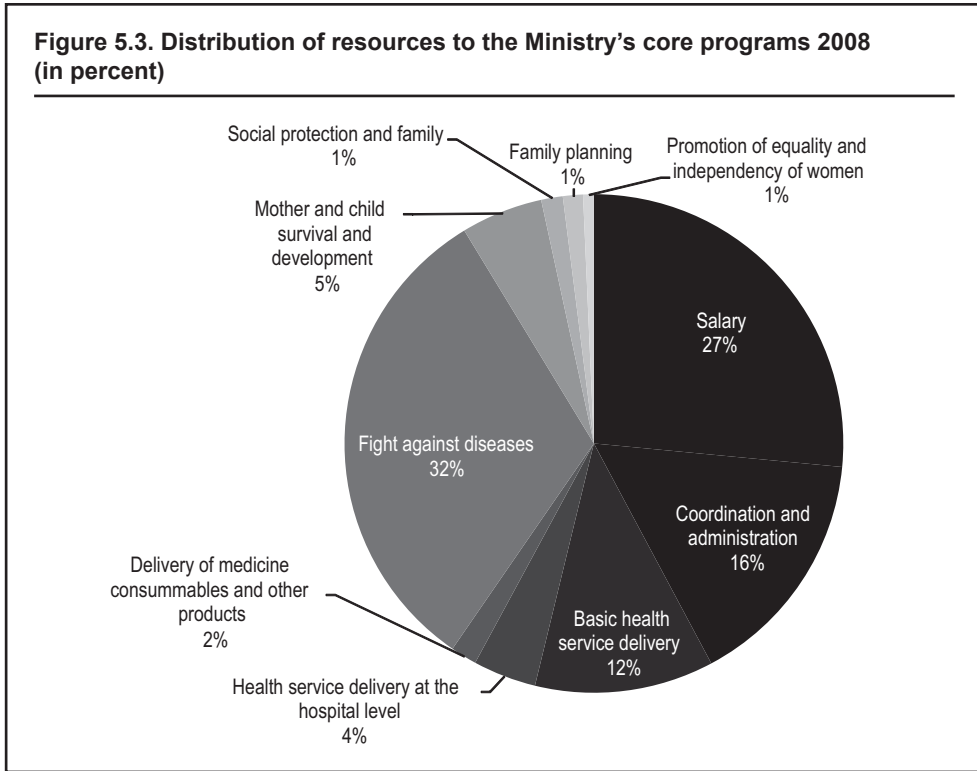
Note: A breakdown of the Ministry's actual expenditures is only available for 2005 and 2006.

A closer look at the allocations to the recurrent and investment budget over the period 2005-2008 shows that the non-salary recurrent budget increased by only 4.6 percent compared to 14 percent of the investment budget (Table 5.2). With smaller increases in the recurrent non-salary recurrent budget, the sustainability of existing and future investment programs is at risk as the provision of additional needed running costs is insufficient. This also suggests that donor support has focused in the past mainly on investment-related programs without ensuring that sufficient funding for operation and maintenance of the investment program is secured in the domestic budget. Moreover, studies and Government reports have shown that the overall level of non-salary recurrent expenditure is insufficient and has adversely affected the operation of the basic health centers, the maintenance of infrastructure, equipment and facilities as well as outreach activities in recent years.¹¹ For example, according to data from the Public Expenditure Tracking Survey (PETS) in 2007, health facilities and other types of medical infrastructure are poorly maintained and only 65 percent of public basic health centers had access to water, 31 percent had electricity, and 56 percent had a means of transportation.

Table 5.2. Growth of MoH's budget by economic category 2005–2008 (in percent)

	2006	2007	2008	Average
TOTAL	4.0	8.3	17.5	9.9
Recurrent	-7.6	16.0	11.2	6.5
Salary	2.5	1.2	26.0	9.9
Non-salary recurrent	-18.8	36.7	-4.1	4.6
Investment	15.9	2.1	23.3	13.8

Source: MFB.



Source: MoH 2008, *Medium Term Expenditure Framework for the Health Sector, 2009-2011*.

In 2008, the MoH budget prioritized the fight against diseases (32 percent) and payment of salaries (27 percent); however, mother and child survival and development only garnered 5 percent of the budget and family planning, 1 percent (Figure 5.3). A key priority of the MoH in 2008 was the fight against communicable diseases (including malaria, tuberculosis, STIs and HIV/AIDS) as shown by the allocation to this core program of around 81 billion Ariary or 32 percent of the MoH budget.

The second largest area of expenditure was on salaries, which represented 27 percent of the Ministry's budget envelope in 2008. However, the real share of salaries in the total MoH budget is much higher (58 percent in the 2008 budget law) since a part of expenses on salaries is accounted for in the various programs. The third largest program was coordination and administration while around 11 percent of the total budget was allocated to basic health care service delivery. In 2008, the Ministry of Health had one of the better prepared budget programs compared to other sector ministries, managing to attribute both salary and non-salary items to the different programs. However, some shortcomings remain and therefore the figures have to be taken with caution.

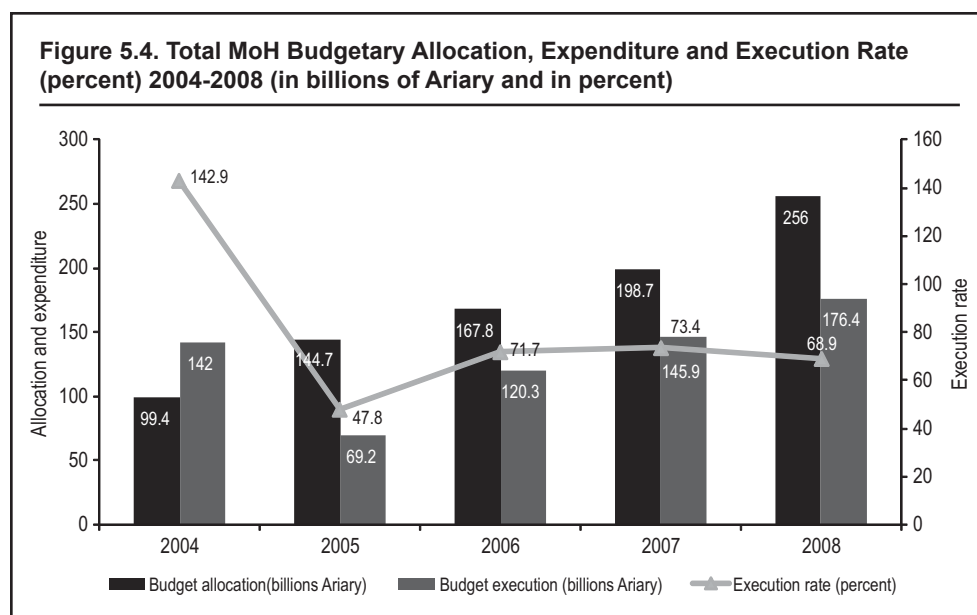
Donor aid finances most of the investment budget; this puts a management strain on the administration. While domestic resources largely finance the recurrent budget, the MoH's investment budget is predominantly financed by donor aid (around 80 percent between 2000 and 2005).¹² More than 15 development partners have provided financial assistance to the health sector until recently; however, the bulk of donor aid is provided by only a few donors.¹³ The vast majority of donors provide their support

through projects in the sector, though the Government has also benefited from general budget support from the EU and the World Bank.¹⁴ This high dependency on donor aid makes the sector vulnerable to the erratic nature of donor commitments, rendering the predictability of funding difficult beyond a two-year period and thus affecting the strategic planning of the Ministry. Moreover, the various donor projects in the sector also put a substantial strain on the administration in terms of the different disbursement, procurement, and monitoring requirements from the donors.

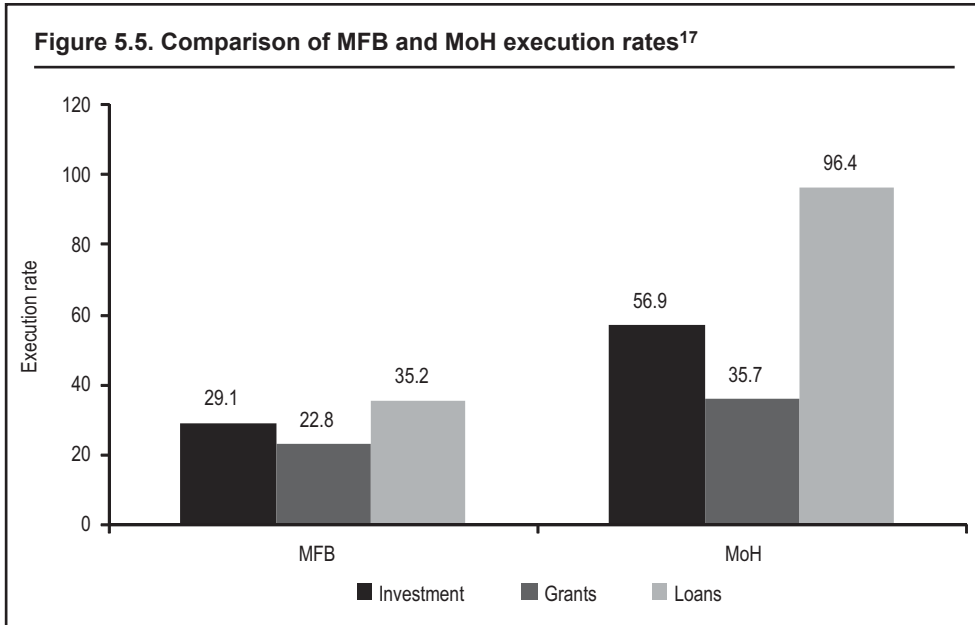
Efforts have been made to increase aid coordination and harmonization. To enhance the dialogue with donors and strengthen the coordination of aid in the sector, the MoH jointly with its development partners began organizing bi-annual Joint Health Sector Reviews in 2007. The reviews have facilitated an exchange of experiences on the ground and provided an opportunity for an open dialogue on constraints, bottlenecks, and potential solutions of sector issues. Moreover, in early 2009, AFD (in a silent partnership with KfW) and the World Bank had committed to putting in place a pooled funding over a four-year period to support the health sector, using a harmonized set of implementation procedures, including audits, financial management, procurement and monitoring and evaluation, so as to reduce transaction costs for the Government.¹⁵ However, given the crisis in early 2009, this financing has been put on hold; moreover, no sector review has been organized as of the preparation of this report.

Budget Execution

According to MFB statistics, the MoH typically manages to execute less than two-thirds of its budget as a result of a low investment budget execution rate and errors in budget preparation. Figure 5.4 illustrates the MoH’s execution rate for 2004–2008 according to MFB statistics. Excluding 2004, the execution rate has remained very low, less than 75 percent between 2005 and 2008.¹⁶ Typically, the budget execution rate for the



Source: MFB; 2008 expenditure figures are based on provisional data provided by MFB in April 2009.



Source: MFB, MoH, December 2008.

recurrent budget is much higher, on average over 90 percent between 2005 and 2009. However, the overall budget execution rate for the MoH is impacted by the low investment budget execution rate, in part due to inaccuracies in the investment budget.

During the 2008 fiscal year, the MoH identified several errors in its budget that inflated the budget envelope, thereby reducing the execution rate (Figure 5.5). First, the Ministry identified a number of projects financed by AFD, the EU and GTZ that had been already closed in previous years and should not have been included in the budget. Second, the MoH found that its 2008 budget had inadvertently included the AfDB's multi-year budget for MoH instead of just the 2008 planned disbursements. Correction for these two errors resulted in an overall smaller investment budget envelope for 2008. The MoH's execution rate of the 2008 investment budget (financed by donor aid) stood at 60 percent (compared to 29 percent according to MFB). Taking into account corrections to the errors, MoH's total execution rate was actually 86 percent, rather than the official rated cited by MFB of 69 percent.

Shortcomings across the budget cycle contribute to the weak implementation performance. While these statistics reflect shortcomings in budget planning, they also illustrate that the sector's absorption capacity is marked by budgetary inefficiencies, such as long administrative execution procedures, slowing down the transfer of resources from the central government to the periphery, flaws in the integrated financial management system and cumbersome reporting requirements of donor-funded projects.

Budget Preparation and Execution Process

In Madagascar, the budget preparation process has improved significantly since 2006, following the distribution of a Budget Framework Paper in May 2006 that includes the draft budget ceilings for the line ministries.¹⁸ (In previous years, budget ceilings were communicated to the line ministries in August/September leaving often less than

a month to the line ministries for the preparation of their budget proposal.) Based on the ceilings, the MoH prepares its draft budget proposal for year $n+1$, albeit in a parallel process with the Department of Administration and Finance (DAAF) preparing the recurrent budget and the Department of Planning (DEP) responsible for the preparation of the investment budget. The consolidated budget proposal (recurrent and investment budget) is transmitted to the MFB in June and discussed during the budget negotiations in June/July. Thereafter, the MFB prepares the final draft of the budget that is presented to Parliament in October.

Prior to 2008, consultation on the Ministry's draft budget proposal by MoH's central administration with the deconcentrated units was weak. This changed, however, in 2008 as the Ministry carried out an extensive training and consultation process with the central administration and regional units (including the district health authorities) that participated in the preparation of the 2009-2012 MTEF and the 2009 budget.¹⁹

The preparation process of the implementation of the budget for year “ $n+1$ ” has also been substantially strengthened. Each health center draws-up its Annual Work Program (AWPs) in August in the year n , based on the results of the on-going fiscal year and projections for the following year. The AWP's are consolidated at the district level into budget proposals during the month of September, validated at the regional level generally in November, and then submitted to the DEP at the central level. Over the past years, the planning, programming, and monitoring functions of regional and district health management teams have been continuously strengthened with the technical support from various partners, including GTZ, JSI and the World Bank. All regions and districts have begun to introduce performance-based planning using management tools. Nearly all the 111 districts are now capable of developing and monitoring AWP's that are part of the implementation of the Ministry's investment budget. Once the final draft of the budget (“*budget d'exécution*”) is provided by the MFB, the district health authorities revise and adjust their AWP's respectively. Steps and responsibilities in the budget execution process are outlined in Box 5.1 below.

The introduction of a budget program concept in Madagascar in 2005 was designed to improve the links between sector policies and budgeting and overall monitoring of the budget.²⁰ To implement the budget program concept, the Government introduced a new organizational chart for budget execution, which includes the executing agent (“*gestionnaire d'activités*”), the financial manager (“*ordonnateur secondaire*”), the

Box 5.1. A brief presentation of Madagascar's budget execution process

The budget execution process in Madagascar is carried out in several stages:

- Initiating expenditures at the commitment stage (“*engagement*”): While the executing agent prepares the technical documents, the procedures for the commitment of the expenditures are initiated by the financial manager (“*ordonnateur secondaire*—ORDSEC”)
- Reception of the service or goods (“*liquidation*”): The executing agent verifies the service and goods and passes a request with the bills to the ORDSEC to initiate the payments
- Issuing and transfer of payment orders to the treasury (“*ordonnancement*”): The ORDSEC prepares the payment order and sends it to the treasury
- Payment (“*paiement*”): upon the reception of the payment order, the treasury pays the client

program manager, the program coordinator and a procurement manager. The different administrative levels involved in budget execution and control of a Ministry's budget aim to facilitate budget execution.

The regularization of the budget execution constitutes a constraint but efforts have been made to address this. The domestically financed budget is subject to regularization on a tri-semester basis, meaning that only a limited amount of the budget can be executed per quarter.^{21,22} This then creates problems in ensuring a timely execution of the budget, since limits are placed on how much of the budget can actually be spent on a quarterly basis. To resolve this issue, the MFB increased the commitment ceilings for the MoH in 2008. According to a preliminary assessment, it was, however, not clear whether these higher ceilings would in fact increase budget execution.²³

The integrated financial management system has improved budget control and monitoring but needs to be further reinforced. In 2006, the MFB introduced a modern computerized integrated financial management system (*Système Intégré de Gestion des Finances Publiques* or SIGFP) to process electronically budget execution and accounting operations across all institutions of the Government.²⁴ This has led to major improvements in the control and monitoring of committed expenditures.

However, following a number of technical problems with the SIGFP, new simplified software was installed at the end of 2008. This has been gradually introduced to all line ministries at the central level, and will be disseminated to the regions during 2009.

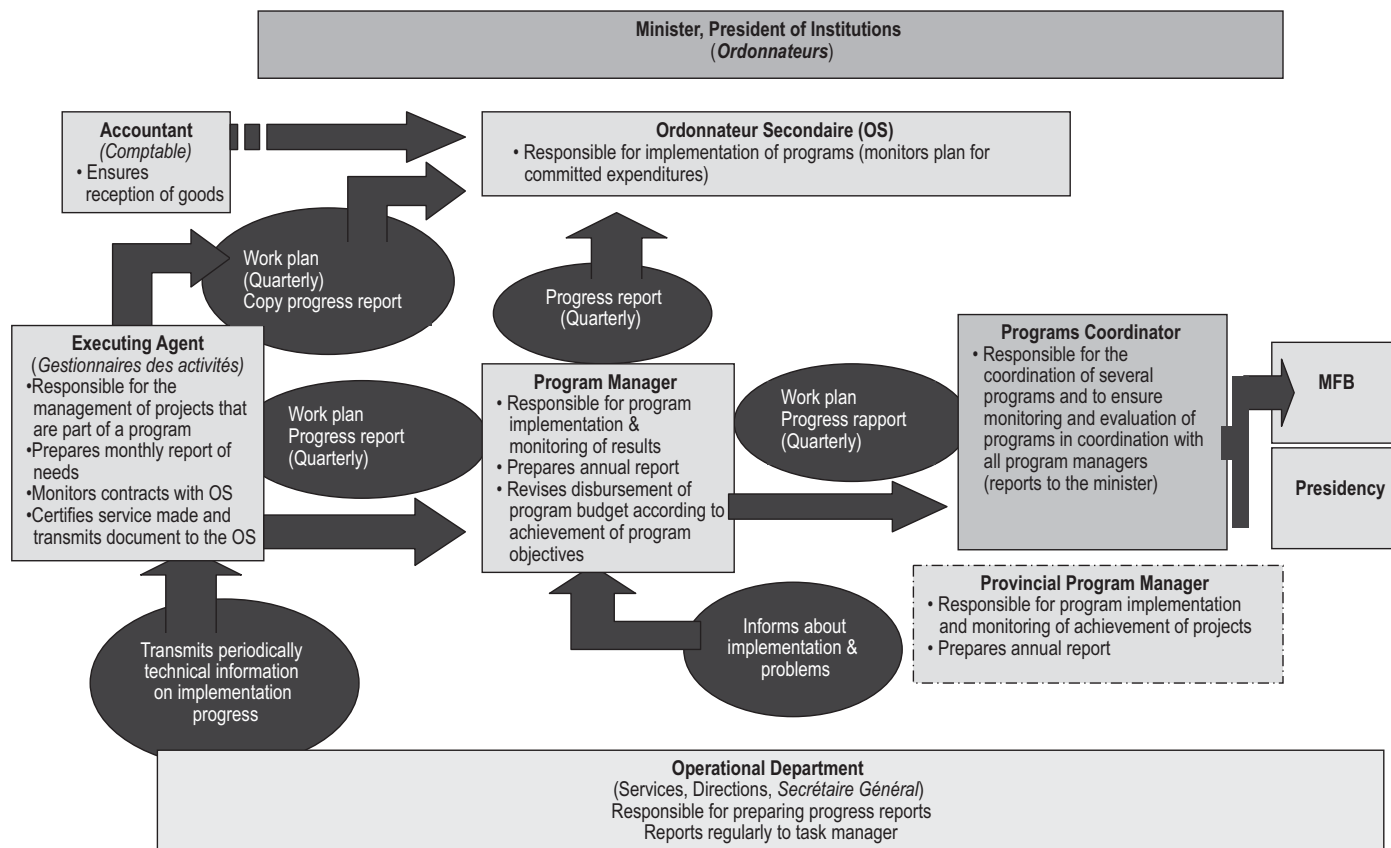
Budget Management Issues

Budget implementation remains a major challenge and despite some improvements, a number of shortcomings still exist in the process, and that have been exacerbated by insufficient funding of basic services on the ground on the one hand, and weak absorption capacity on the other.

Despite advances in budget presentation, the MoH continues to face a number of challenges in budget preparation. First, while the planning and budgeting of activities is systematic at the health center and district levels, the process is not very efficient at the central level. For one, recurrent and investment budgets are prepared separately resulting in inconsistencies between investment and recurrent (non-salary) expenditures. This means that medium-term recurrent cost projections of existing and planned investments are not methodical, and there is insufficient analysis on the cost-benefit of maintaining existing policies and/or investment decisions. To further aggravate the problem, the budget framework provided by the MFB to line ministries is always late, leaving insufficient time for the MoH to revise its draft budget proposal in line with the actual budget envelopes (inscribed in the budget framework paper) prior to the budget hearings. Lastly, there have been also significant delays by the development partners in transmitting the planned disbursement of donor aid to be integrated in the annual budget law. In general, the quality of the figures has been insufficient, albeit often based on rough estimates.

Furthermore, during 2008, the Ministry allocated significant administrative capacity to update its MTEF for 2009-2011. However, the budget envelopes for 2010 and 2011 are based only on a "needs assessment", disconnected from a global MTEF that does not exist. Delays in the finalization of the MTEF 2009-2011 and above all, the absence of reliable medium-term resource envelope constrained the MoH's use of the MTEF as

Figure 5.6. Roles and responsibilities in project and budget management ²⁵



Source: MFB.

a strategic planning instrument and weakened the position of the MoH in its advocacy and dialogue with the MFB during budget hearings.

Even though efforts have been made by the MFB to simplify expenditure procedures, numerous and cumbersome procedures still exist, limiting the MoH's ability to efficiently execute its budget.²⁶ According to one evaluation, on average, twenty different steps and at least seven days are required to process any kind of payment.²⁷ Moreover, delays in certain key procedures such as the nomination of the Credit Manager, and limited technical expertise at the central and local levels, makes it difficult to carry out timely commitments against the budget at the beginning of the fiscal year.

The advantages of the budget program, including flexibility to shift expenditures, are not fully capitalized. A key advantage of the budget program is that the program managers have more flexibility to shift expenditure across some broad spending categories (such as structural recurrent expenditure, exceptional recurrent expenditure, investment expenditure etc.) with the exception of salaries, as well as to carry over expenditure to the next budget year on the basis of a joint decree by the MFB and the concerned ministry (again with the exception of salaries). However, in Madagascar, owing to the extensive use of reallocation procedures in the past years, the MFB has limited the budget flexibility of the program manager to movements of expenditures within the non-salary recurrent expenditures and transfers budget categories. The ceiling of reallocating 10 percent of resources inscribed in the budget has put an additional strain on some sector ministries' budget reallocation.

Insufficient technical and institutional capacity hampers procurement. Even though procurement procedures are based on a new procurement code introduced in 2004 following international standards, audits conducted in 2007 and 2008 in the four sector ministries (including the MoH) revealed an increase of compliance, yet also the need for more capacity and expertise combined with stronger supervision by the procurement oversight authority. The main bottlenecks are: (i) insufficient technical capacity of the *executing agent*; (ii) weak procurement units; and (iii) delays in the nomination of the *procurement manager* in the regions, all of which resulted in severe procurement delays.

Despite significant efforts to improve the operationalization of the SIGFP, the system remains plagued with operational difficulties (for example, blackouts of the network, long waiting periods, resistance of the agents to use the system, and poor security of the data).²⁸ The ongoing trial period of the new software has not yet allowed the MoH to have timely and accurate access to information on budget allocations, commitment, and actual expenditures. Furthermore, the absence of information technology centers (that are connected to the SIGFP) in some regions delays the budget commitment process as well as the transmission of information from the local to the central administration.

Another key factor contributing to the low execution rate is the inadequate flow of information, specifically the commitment of expenditures at the central level due to infrequent regularization of donor grants and the VAT. As already indicated above, the execution of donor-funded investment programs amounted to less than 30 percent in 2008. While this can be in part attributed to errors in the 2008 budget, the bigger problem is the delay in the reconciliation of accounts of grants within the fiscal year, which adversely affects the Ministry's execution rate. In fact, in order to effectively register expenditure in the Government's accounting system, supporting documents are needed that are often provided late.

Furthermore, as is the case for most sector ministries in Madagascar, mid-year budget execution is slow. The execution of the recurrent budget at the end of the 2008 fiscal year was satisfactory, at 98 percent (Table 5.3). This good performance masks the shortcomings in the timely execution of the overall budget during the fiscal year. The commitment of MoH's expenditures begins late in the fiscal year (e.g, the Ministry's budget execution rate was only 14 percent in May and 37 percent in July of 2008), but accelerates towards the third quarter when the end of the fiscal year is nearing. This execution trend is not aligned either with the timeframe of the AWP's nor the requirements of the health centers and hospitals or the needs of the population they serve. The delayed implementation of the budget at the beginning of the fiscal year can be attributed to delays in the appointment of the executing agent and financial manager, difficulties in the utilization of the SIGFP and the application of disbursement and procurement procedures.

Table 5.3. MoH's budget execution rate by economic classification, 2008

Expenditure by function	Execution rate (%)
Recurrent budget	98.5
Salary	99.2
Non salary	97.6
Investment	44.1
Total	68.9

Source: MFB (based on figures provided by the Budget Directorate in April 2009).

Insufficient resource transfer and weak capacity constrains the implementation of the Annual Work Programs. At the regional and district levels, AWP's are not implemented on time because funds are insufficient and arrive late from the central level while technical capacity to manage big procurement contracts of equipment and large quantities of commodities is inadequate. To add to this, support from the central level to improve budget implementation is limited, budget management functions remain weak at the central level itself, and both administrative and managerial capacity needs to be strengthened.

Lastly, the many reporting requirements constitute a severe administrative burden on the MoH. The Ministry prepares reports on a monthly, quarterly, bi-annually and annual basis at all administrative levels that in turn feed into a number of different reports related to the implementation of the PDSSPS 2007-2011 and the MAP. The same is true for health centers that prepare around 20 reports each month for the central administration. This not only takes an enormous amount of staff time, but also raises questions on whether the Ministry does in fact need or use all this data for strategic planning and decision-making.²⁹

A number of budget reforms have been carried out in recent years, including coaching and training, dissemination of guidelines, information technology support, and staffing. In an effort to address allocative inefficiencies and institutional weaknesses, the MoH established a task force in 2007 to prepare the MTEF as well as the 2009 budget program. This team consisted of representatives from the Permanent Secretary's office, the DEP, DAAF, and the DDDS, which greatly improved collaboration and dialogue on budget planning issues between these departments. However, the focus of the task force was mainly on budget planning at the central level, whereas more emphasis needs to be placed on training and regular support on budget management issues at lower levels.

This would go a long way to improving the overall coordination and harmonization of the budget costing and planning across all administrative levels.

Furthermore, a number of measures were put in place during 2008 to specifically improve the execution rate, including: (i) budget implementation support to certain larger technical Departments and in particular, the region of Analamanga (with one of the lowest execution rates) through a “coaching team”;³⁰ (ii) circulation of guidelines on the management of the Public Investment Program at the regional level; (iii) information technology support to de-concentrated levels for the transmission of information via email; (iv) increased collaboration with the Directorate of Information Systems of the MFB to reinforce the utilization of the SIGFP at the MoH; and (v) recruitment of additional procurement staff at the regional and central level to strengthen procurement.

In addition, to deal with the low execution rate of externally financed investment programs and improve the information flow between the MoH and the development partners, in December 2008, the MoH jointly with the donors nominated a “focal point” for each partner to facilitate the flow of information, and in particular, the timely regularization of expenditures. Furthermore, training sessions on the program budget and the MTEF were organized for the staff at central and regional levels in 2007/2008, and groups of trainers were trained who subsequently facilitated the preparation of the MTEF 2009-2011 and budget programming at the regional level. However, since the country has been in crisis since the beginning of 2009, it is not clear whether these initial accomplishments will be sustained.

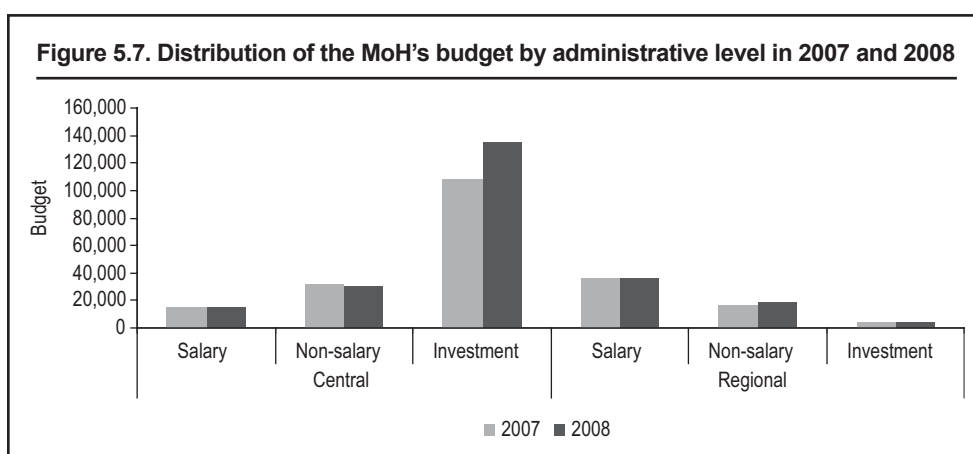
Equity of Health Spending

A key measure of performance in a health care system is how fair a financing system is in terms of its impact on the distribution of access to and utilization of health services. Equity has long been considered an important goal in the health sector, yet inequalities between the rich and the poor persist. The poor tend to suffer more from higher rates of mortality and morbidity and use health services less often, despite having more of a need. Notwithstanding their lower levels of utilization, the poor also often spend more on health care as a share of income than the rich, or those better-off.³¹ In addition, some non-poor households may be made poor due to catastrophic illnesses that necessitate out-of-pocket spending on health, in particular at hospital level.

*Distribution of Public Resources*³²

Even though the Government made some efforts to devote resources to certain priority areas in the health sector to achieve the MDGs, such as to the fight against communicable diseases, the MoH continues to face critical allocation decisions. A key challenge is hereby to ensure that available resources are correctly directed towards health interventions that have the greatest impact on health outcomes and benefit those most in need.³³ Though the distribution of resources to the different health functions generally corresponds to country priorities, some evidence suggests that a share of expenditure is largely bypassing the poor. For example, around 0.5 percent of the 2006 health budget was used for the construction of a sophisticated medical complex in the capital city, which continues to be non-functional. Moreover, according to the latest NHA, the rich use health services four times more than the poor: 41 percent of the total health expenditure was utilized by the richest quintile, whereas only 10 percent was used by the poorest quintile.³⁴

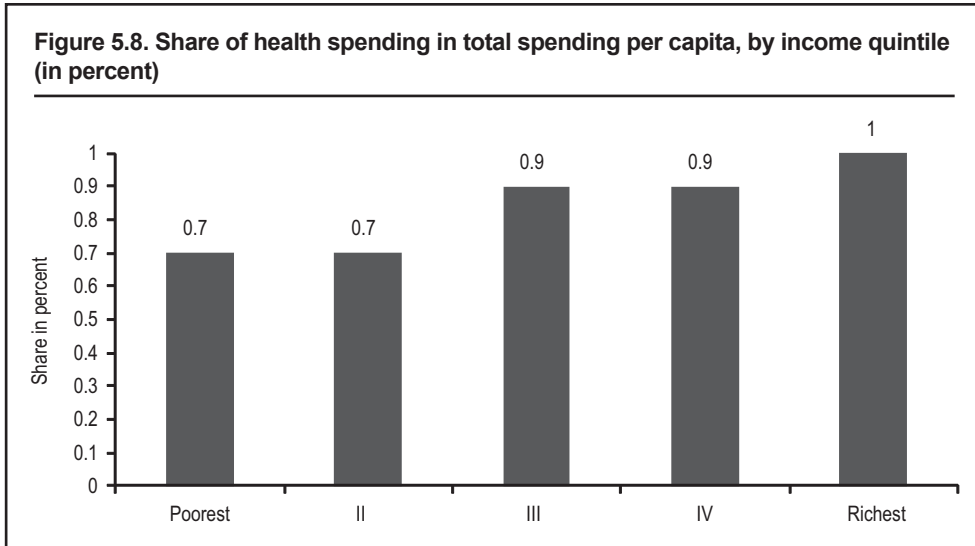
The budget remains largely centralized, with only 38 percent of non-salary recurrent budget transferred to the regions. A comparison of the distribution of the health budget from 2007 to 2008 confirms that even though substantial efforts have been made to improve the financing of regional administrations, the health budget is still largely allocated to the central administration, hampering the transfer of health resources and services directly to front-line providers (Figure 5.7). Apart from salaries, only 38 percent of the total (non-salary) recurrent budget was transferred to the regional level with the main beneficiaries being district hospitals, basic health centers and the district health authorities in 2008. Increases of the (non-salary) recurrent budget between 2007 and 2008 were in favor of the regional health authorities, regional and district hospitals and basic health centers.³⁵ Moreover, the bulk of the investment budget continues to be managed at the central level.



Source: HERA, Support mission regarding the definition of the component “deconcentration and development of basic service health centers,” July 2008.

Furthermore, the recurrent budget of the MoH is unequally distributed across regions.³⁶ Richer regions receive higher amounts of non-salary recurrent budget per capita than poorer regions, and qualified medical staff are more concentrated in urban areas.³⁷ In fact, according to the 2007 Public Expenditure Review, evidence suggests that the more qualified the personnel is, in particular the doctors, the more uneven the distribution at the primary care level.

The unequal distribution of the budget is due to a lack of criteria governing the distribution of health resources across regions and especially to front-line providers. District health authorities have transferred either no resources or small amounts to health centers, explaining in part the poor quality of services delivered at this level. The absence of clear criteria for equitable distribution of health resources across regions and districts renders the distribution of resources opaque, resulting in a distribution left to the discretion of the district medical inspectors. In 2008, in order to increase the budget allocated to district hospitals and health centers, the Ministry provided a separate budget line for health centers in the budget law. Even with the boosting of their budget, health centers continue to have a limited capacity to efficiently utilize the additional resources, resulting in a weak execution rate of their investment budget.³⁸



Source: EPM 2005.

Differences in Health Expenditures and Utilization between Rich and Poor Households

Individuals in the top quintile spent a larger share of their income on health-related expenditures than those in the bottom quintile (Figure 5.8) as shown by the 2005 household survey. This is consistent with the observation that the poor undergo fewer treatments than the rich (due to income limitations) while the rich consult more private providers.³⁹

Recently, a number of innovative strategies have been designed and piloted to increase the utilization of basic health services and tackle financial barriers in the system. Madagascar faces high numbers of maternal and neo-natal deaths, partly due to inadequate, inappropriate, and unaffordable obstetric and neonatal healthcare services. To seek to address this issue, an emergency neonatal and obstetrical care pilot was designed and implemented in two regions whereby funds were made available in seven hospitals for emergency neonatal and obstetric care for mothers and children requiring these services. Even though the pilot was implemented at the hospital level, its success was based on the performance of health facilities and community health workers in referring women with complications to the hospitals. Providing these services free-of-charge to clients was expected to increase the number of emergency obstetric and neonatal care procedures at the hospital level as well as encourage more births attended by skilled personnel in health facilities across these two regions, boost the revenue earned by the hospitals involved in the initiative and improve the overall quality of obstetric and neonatal healthcare services offered. Results thus far have been positive: a total of 962 caesarian operations and 1,126 neonatal emergency procedures were carried out in the selected health facilities by the end of July 2009, and there is an active waitlist. There has also been a 6 percent increase in overall hospital utilization rates. Despite concerns that the free-of-charge nature of the service may attract those who have the means to pay for these services as opposed to the most vulnerable, a preliminary evaluation of the pilot carried out in February 2009 revealed that the free-of-charge service did not attract more private clients and there was a slight decrease in average cost/per capita of the procedures. A final evaluation of this pilot will be carried out in 2010.

Equity and Risk Pooling Schemes

In Madagascar, a key challenge is to establish adequate mechanisms to pool health risks and provide financial protection to the population, especially the poor. As mentioned earlier, financial barriers to access represent the main cause of low utilization of health services.⁴⁰ The high level of out-of-pocket spending raises economic obstacles for the poor who seek much needed care and, when they do use it, makes them suffer from the impoverishing costs of the care they get. The importance of out-of-pocket spending in both private and total health spending is a consequence of both the lack of risk pooling and the potential inequities in health financing, given poor people's limited ability to pay. However, ensuring financial protection and promoting equity requires specific government policies that ensure contributions are based on ability to pay, prevent individuals from falling into poverty as a result of catastrophic medical expenses, and facilitate equitable financial and physical access to services.

One such mechanism is the Equity Fund, which grew out of different experiences with the elimination of user fees and introduction of a new cost recovery system, FANOME. Given the income disparities in Madagascar and recognizing its budgetary constraints, the Government introduced the *Participation Financière des Usagers* (PFU), a cost recovery system that replaced a previously free system with user fees for drugs at the health center level in 1998. The system was designed to ensure a steady supply of drugs to health centers by charging users for the medicines prescribed, with a 35 percent mark-up, and using this income for restocking the facility's pharmacy and covering certain other recurrent costs. At the hospital level, equity funds are used for funding drugs, health services, and different categories of lodging.

In July 2002, the Government abolished user fees for health and education following the 2002 political and economic crisis and subsequent increase in poverty, resulting in a significant increase in the utilization of health services.⁴¹

The increase in health resources was, however, not sufficient to compensate for the loss of user fees. Drug stock-outs became more common and the quality of services deteriorated further as the workload of the already insufficient health personnel increased. This (temporary) provision of free care at the health center level highlighted the tension between efficiency and equity and stimulated the debate on the appropriate role of user fees, which on the one hand, can improve efficiency but on the other hand, discourages the poor in using health services.

Official user fees were re-introduced at health center level in early 2004. After their reintroduction, there was an overall decrease by 30 percent in the utilization of health centers which has been in part attributed to a decrease in the purchasing power of households (around 30 percent for rural households) and the increase in the price for rice.⁴² To improve financial access to basic health services, the Government identified the development of innovative financing methods as a priority within the framework of the MAP.

In 2005, the new cost recovery system—known as *Fonds d'Approvisionnement Non-stop des Médicaments* (FANOME)—was established to facilitate the replenishment of essential medicines and supplies by the health centers. A certain percentage of the FANOME was then placed in an Equity Fund designed to provide free access to medicines for the most vulnerable segment of the population⁴³ without putting an additional burden on the health budget. To this end, a small percentage of the mark-up from the sale of drugs (2.2 percent each month from the 35 percent profit margin) is set aside to be used for the Equity Fund. The system is community-based and therefore, expected to be more sustainable (Box 5.2).

Box 5.2. Some key elements of the equity funds at the health center level

Identification process. The MoH has prepared indicative guidelines to determine eligibility and to be considered, a person needs to meet four of the following six criteria: homelessness, without income, without an occupation, having a disability or disabling illness, aged over 60, and with a family of more than seven members. As outlined in the FANOME manual, the community lists the local selection criteria adapted to the local context, and applies them to select beneficiaries eligible to participate in the Equity Fund. While this identification process should be carried out by the Community Health Committees, in reality, the chiefs of the “Fokontany” often identify the most vulnerable population in their community in response to a request from the mayor. However, the PSIA showed that in general no fraud or favoritism was detected in the selection of the beneficiaries. Once the identification process is completed, the official list is made available to the “Fokontany,” the commune and the health center/pharmacy. The health personnel (doctor or nurse) who prescribe the medicine and the “distributor” must have copies of the list to verify the patient’s eligibility. The list is supposed to be updated each year in accordance with available funds. The guide does not include the need to consult with the persons on the list as the beneficiaries are expected “to wish to be on the list.”

Procedures for the beneficiaries. Once on the list, beneficiaries are provided with a health card from the commune granting them eligibility for free drugs. Patients can present their card to their physician or paramedic at the beginning of the consultation and receive a special voucher for any medical prescriptions. Upon presentation of the voucher to the pharmacist, the drugs indicated in the slip are to be provided free of charge.

Management and oversight. The new system of the FANOME and Equity Fund relies on a partnership between the communes, the villages, and the health center. The local communes (Fokontany or villages) that are part of the health center catchment area elect the members of a Community Health Committee that, in turn, elects a Management Committee at the commune level that is responsible for the sale of the medicines and the management of the equity funds. The commune is responsible for the payment of “distributor” of medicines.

Supervision and oversight. The Management Committee is responsible for producing monthly reports, keeping an inventory of medicines and supplies, preparing reports on revenues and expenditures and holding receipts and financial reports. The health center is responsible for the preparation of consolidated reports while the members of the district management health teams undertake periodic supervision.

Management of the Equity Funds. The money from the sale of medicines is collected by the “distributor” who transfers them regularly to the accountant of the Management Committee. The money is then deposited regularly into a bank account or an account at the post office. All account transactions require the signatures of the accountant and president of the Management Committee. The funds generated by sale of medicines are used by the Management Committee and the pharmacy to buy medicines, pay for transport, cover bank expenses, maintain the health center infrastructures, and finance the manager and accountant of the Management Committee. Additional financing may be provided by the communes together with the local management and health committees through community fundraising activities.

Source: World Bank, *Madagascar, Poverty and Social Impact Analysis of Health Care and the Poor*, 2008.

The FANOME and Equity Fund program somewhat succeeded in targeting the most vulnerable population but coverage remains low and not all Equity Funds are being used. According to an evaluation carried out in the context of a Poverty and Social Impact Analysis (PSIA), around 87 percent of the listed participants are part of the poorest segments of the population but coverage remains limited: around 95,000 potential beneficiaries have been identified locally (less than 1 percent of the national population), of which only 14 percent received support.⁴⁴ Moreover, in one district,⁴⁵ the Equity Fund

had around Ariary 2.4 million, which would be sufficient to support about 2,400 patients given existing fees.⁴⁶ This, however, is a negligible share of the district's more than one million inhabitants. Finally, although the funds are operational in theory throughout the country, in fact, many health centers are not using the funds due to legal and regulatory issues.

Key challenges include targeting of the poor, low use of the program by beneficiaries due to stigma and lack of information and weak accountability and monitoring. The targeting for fee exemptions has been one of the biggest challenges since the creation of the Equity Funds. Despite evidence that in general the poorest residents are identified, the identification process often excludes those who have not registered with the Fokon-tany (such as the homeless and other marginalized groups).

A challenge has also been the development of the local selection criteria to identify the poorest residents. Moreover, the PSIA showed that the social stigma attached with being identified as poor is one of the main problems affecting the effectiveness of the Equity Funds. Another shortcoming is that the poor are typically not well informed about the system of exemptions (and other potential benefits). Furthermore, no systematic evaluation has been undertaken to monitor if the enrolled participants have effectively benefited from services. Moreover, there are no monitoring indicators for the management and impact of the Funds, such as the number of meetings of the Management Committee or the creation of the Management Committee by the Community Health Committee.

Financial solvency of the Equity Funds depends on use of the health center. Although the Equity Funds at the primary health care level were initially capitalized, the only revenue they receive is from the sale of drugs at community health centers. Therefore, the solvency of the Fund is directly tied to the population's utilization rate of health centers. The mobilization of resources for the Equity Funds depends on a number of factors, including the capacity of the population to pay for the services at health centers, the quality of the services and the ability of the health center to attract clients in an environment where it competes with the private sector. Field visits carried out for the PSIA showed that Equity Funds with a high utilization rate were in deficit. There are large variations in the financial sustainability of the Equity Funds, even within a same district, which suggests there is a need to develop targeting mechanisms for government subsidies or private sources.⁴⁷

Equity Funds have been also gradually introduced at the hospital level. Resorting to Equity Funds is a necessity at the district hospital level as most surgical and other medical supplies are not available at the hospital level and must be purchased in private outlets, resulting in unreasonably expensive bills for the patients. Around 60 percent of those who require healthcare at hospitals are unable to pay for it at the time, but may be able to pay in installments.⁴⁸ To address this, the MoH set up on a pilot basis an Equity Fund with GTZ support at the district hospital of Marovoay (Majunga region) which buys health services from the public providers (Box 5.3).

Though the coverage is low, experience with the hospital Equity Fund appears encouraging, although geographical barriers remain. The hospital Equity Fund program began in January 2005 and planned to finance about 750 people (within an overall population of about 300,000) during the first year. The identification of persons eligible for an Equity Fund at the hospital level is difficult as the patients and their economic situation

Box 5.3. Some key elements of the equity funds at the district hospital level

Identification process: The identification of beneficiaries is done through a pre-identification carried out by religious groups and validated by the local health management committee. Social workers at the hospital also screen potential beneficiaries, which include the “temporary poor” (patients who are temporarily incapable of paying). A welfare officer, based at the hospital, is responsible for identifying other potential beneficiaries, such as the “temporary” poor, pregnant women needing urgent obstetrical interventions, etc. 85 percent are poor people pre-identified by the ecumenical groups and the rest was identified by the welfare officer.

Benefits. Eligible patients (and one accompanying person) are reimbursed for their health care costs, food, and transport expenditures. GTZ finances diagnosis and health care (67 percent of total cost), while transportation costs are financed by local religious groups (10 percent) and food is provided free of charge by the hospital (3 percent).

Source: World Bank, *Risk Management and Social Protection Strategy*, July 2007

is not always known, and it is not possible or cost-effective to spend time assessing each patient’s financial capacity. Therefore, because of their good knowledge of the population’s socioeconomic conditions, religious groups have been responsible for identifying the poor households. Using these groups has the added benefit of reducing the risks of stigmatization and of corruption.⁴⁹ Furthermore, given the difficulties in identifying the eligibility of persons for an equity fund, the MoH decided to introduce systematic free obstetrical care through free cesarean section kits to ensure available assistance to poor and vulnerable pregnant women. It will be important to assess the impact of this decision on the Ministry’s budget.

Challenges also exist in the implementation of Equity Funds at the district hospital level. Initial figures based on the Marovoay pilot suggest some level of increased access by the poorest community members. Although only 2 percent of the population was pre-identified as the target population, 12 percent of hospital patients have received support. However, 85 percent of patients receiving subsidies come from within a radius of 30 kilometers, indicating constraints on access to those living farther away. It is noteworthy that the fear of being stigmatized of being poor, encountered as a key constraint in the case of equity funds at the CSB level, has been less of an issue at the hospital care level. Apart from the coverage, there are also some concerns regarding the sustainability of the financing framework because it relies mainly on foreign donor assistance and there are no cost-control measures yet in place.⁵⁰

Health insurance schemes in Madagascar are limited. The objectives of health insurance schemes are to pool risks, foster prepayment, raise revenues and purchase services. In general, however, health insurance institutions are a very limited source of health care spending, especially in low-income countries where a significant portion of the population is excluded from the formal sector. There are four types of health insurance: (i) state-based systems funded by the government; (ii) social health insurance; (iii) community-based health insurance; and (iv) private health insurance.⁵¹

Madagascar has all the elements of a State-based system as the MoH is the main provider of services for the population, although is not very equitable or efficient. National health service-style systems generally have three main features. First, their primary funding comes from general revenues. Second, they provide medical coverage to the entire population. Third, services are delivered through a network of public provid-

ers. In Madagascar, the MoH is the main provider of national health services, and as such, in theory, services have the potential to be equitable and efficient due to a number of characteristics, i) the broad coverage of national health systems implies that risks are pooled broadly without the dangers of risk selection inherent in more fragmented systems, ii) the system's reliance on a broad revenue base, and iii) transaction costs tend to be lower given the dominance on a single player.⁵² In reality though, very few developing countries have reasonably equitable and efficient national health systems. In the case of Madagascar, the publicly-financed health system faces a number of shortcomings as a result of unstable funding (e.g vulnerability to vicissitudes of annual budget discussions and political crisis), flaws in budget implementation, inequities in the access to health care etc. that prevent it from being as efficient and responsive to the needs of the population as it could be.

The narrow base of formal employment constrains the development of a compulsory social health insurance scheme in Madagascar. Social health insurance systems are generally characterized by independent or quasi-independent insurance funds, a reliance on mandatory earmarked payroll contributions (usually from individuals and employers), and a clear link between these contributions and the right to a defined package of health benefits.⁵³ Some of the advantages of those schemes over, for example, community-based insurance are the substantially bigger risk pool and the potential for redistribution of resources. They can be an effective way to raise additional resources for health and to reach universal coverage. Some of the potential pitfalls for these schemes are the need to establish payment mechanisms that create incentives for the poor to use the services and for the service providers to reach the poorest, and the lack of direct involvement from communities.⁵⁴ In general, social health insurance schemes are easier to administer with a high proportion of formal sector workers as employers will likely have a formal payroll system for contributions.⁵⁵ Other preconditions for the successful development of such a system, such as a growing urban populations and increased population density, room to increase payroll contributions without negative effects on employment, a strong administrative capacity and a stakeholder consensus in favor of social health insurance are not yet or only partially in place.

In Sub-Saharan Africa, only 2 percent of all public spending on health is through social insurance institutions. In fact, for many low-income countries with a continuous growing proportion of workers in the informal sector and stagnant economies, the introduction of such a social insurance scheme is not yet suitable. Madagascar's labor market characteristics (such as a high labor force participation and employment rates, low formality and wage employment rates and a large share of the population being active in agriculture) are typical for a low-income country.⁵⁶ In fact, considering the total workforce, including non-wage workers, approximately 95 percent of the 8.3 million working-age adults are informally employed.⁵⁷ A small number of health insurance schemes do exist, but only cover a very small fraction of the population that typically does not include the poorest and/or the sickest. The most institutionalized health insurance system is private, comprising of the large urban employer-based Mutuals (OSTIE and AMIT) but is limited to formal sector workers (in particular young workers from the export processing zones) in the urban areas. Information on the coverage and effectiveness of these insurance systems is not available.

Madagascar has more than ten years of experience with community-based health insurance schemes. These schemes can be broadly defined as not-for profit voluntary prepayment plans for health care that are managed by a community. Most community-based health insurance schemes operate according to core social values and cover beneficiaries excluded from other health coverage.⁵⁸ In Madagascar, the Government began introducing pilot community-based insurance schemes in 1999 to reduce financial barriers to healthcare. Around 95 percent of the Malagasy population earns their livelihood from agricultural activities; consequently, their revenues are based on the agricultural seasons and they are more prone to economic, environmental and human health shocks.⁵⁹ Such schemes provide the opportunity to manage the risk of falling ill, especially during the lean period right before the harvesting season. A first community-based prepayment scheme (with limited credit), or *mutuelle* was piloted by Medical Care Development International in Toliara in Southwest Madagascar in 1999 (Box 5.4).

Box 5.4. Community Insurance Scheme (Mutuelle) of Ankazomanga-Ouest

This community-based prepayment scheme serves a community of 3,377 people who earn their living through farming and animal husbandry. The *mutuelle* is a credit system for health expenses incurred at the local health facility. The credit pool is funded by individual monthly contributions of Ariary 500 (about US\$0.25). Families who make contributions receive a membership card, which they can use to visit the health center at any time. The *mutuelle* covers the cost of their visit, paying the money directly to the health center. Members have 21 days to reimburse sums disbursed to cover their personal or family health care costs. Credit is also extended for members who have other types of financial problems. Control and internal management are delegated to community members who have established a system of eight village offices plus a central office located near the health center.

Source: Toliara Province Child Survival Project Mid-Term Evaluation, October, 2005, Medical Care Development International.

The *mutuelle* was launched in response to requests from the local community and in accordance with MoH policy on the financial participation of health center users. The objective was to improve villagers' financial access to health care by spreading small premium payments over the year. Results of the *mutuelle* for the first five years have been encouraging. More than half the population, 61 percent, is part of the scheme and household surveys revealed that the system has generated a sense of financial security among its members. As a result, use of health services has increased by 92 percent, and prescriptions paid at health centers have increased by 77 percent.⁶⁰ The *mutuelle* is now owned and operated by Ankazomanga-Ouest's civil society. Similar community-based health insurance schemes were also piloted in the regions of Haute Matsiatra and Atsinanana in 2005 to provide financial protection for those who would otherwise not have access to health coverage (Box 5.5).

International experience with community-based health insurance suggests such schemes can form part of a transition to a more universal health care coverage system. Even though the poorest may have difficulty paying the small premiums, the needs of the transitory poor can be addressed by a community-based health insurance system which could also free up resources to expand coverage of the fee waiver program for the very poorest populations.⁶¹ They may also fill gaps in existing schemes and, addition-

Box 5.5. Two examples of pilot community-based health insurance schemes in the regions of Haute Matsiatra and Atsinanana

Currently, in the **region of Haute Matsiatra**, all 80 communes are part of a social insurance scheme that functions like community-based health insurance. It is open to all residents, and anyone wishing to subscribe is required to pay a premium of around Ariary 1,000/\$0.50 per annum, which can be paid in cash or kind/rice. Through effectively pooling risk, each person's total premium expenses are far lower than the cost of treatment, should they fall ill. One of the main challenges was to determine the proper level of the premium to ensure incoming funds were adequate to cover health expenses, but not so high that they become unaffordable.

This scheme has been in place for the last four years, and has already catered to the needs of many Malagasy citizens, contributing to increasing access to healthcare and helping to build community ownership and mutual responsibility.

A feasibility study conducted in **Vatomandry (in the region of Atsinanana)** in July 2005 highlighted the problems of financial accessibility, e.g. people visited health centers depending on the regularity of their income that was for the most part based on agriculture; 80 percent in the urban areas had no savings at the end of the year, and those in the rural areas, could only save during the harvest periods. Based on the findings, it was decided to pilot a social insurance scheme to decrease the financial burden of health care coverage within nine communities in Vatomandry. The scheme started in December 2005 with financing from the French Cooperation, and each member was required to pay an admission fee of Ariary 500, and a minimal monthly fee of Ariary 300. The financing ended in December 2007, and an evaluation of the pilot was conducted shortly thereafter.

The scheme was a success in terms of numbers of clients enlisted as it started out with only 557 members, increasing to 1,515 by December 2008. However, in early 2007, it became obvious that the monthly contribution was too little to cover all health expenses, and the scheme was in deficit. Nevertheless, the monthly fee has not been increased, and district health authorities have not yet addressed this problem.

Source: SantéNet and Inter Aide.

ally, there is evidence that such schemes reduce out-of-pocket spending while one study found that they contributed to greater use of health resources.⁶²

But, some shortcomings exist, including limited income of the community and voluntary membership reduces the size of the risk pool. The protection and sustainability of most community-based health insurance schemes is debatable since they are often unable to raise significant resources because of the limited income of the community. Also the pool is often small, making it difficult to serve a broad risk-spreading and financial protection function. The schemes' size and resource levels make them vulnerable to failure.⁶³ In the case of Madagascar, despite the successful management of the *mutelle* by the Ankazomanga-Ouest's civil society, some evidence of the community-based health insurance schemes in the regions of Haute Matsiatra and Atsinanana suggests that the schemes continue to function but on an extremely limited scale. They also seemed to have limited success in reaching the absolute poorest segments of the population.

Finally, private or voluntary health insurance is limited in Madagascar. Private or voluntary health insurance often supplements publicly funded coverage, especially in middle and high-income countries. Private health insurance is paid for by non-income-based premiums (not tax or social security contributions). Voluntary health insurance is defined as any health insurance paid for by voluntary contributions. Private/voluntary health insurance markets have been found to be complex and seem to be in general to be

a more plausible option for middle-income countries with large literate and mobile urban populations. In Madagascar, such a health insurance scheme is not yet widespread given that only a minority of the population is likely to be willing and able to afford unsubsidized private/voluntary health insurance.

Efficiency Issues of Health Spending

While mobilizing resources for the sector is important, efficient and equitable utilization of public resources in the health sector is critical, especially in Madagascar with its on-going budget constraints and difficulties in generating additional fiscal space. In turn, improving the efficiency of current expenditures has important financial implications for long-term fiscal sustainability and for governments to find the “fiscal space” in constrained budget settings. The following section discusses elements of efficiency of Madagascar’s health system from various perspectives, such as the efficient management of expenditures, cost-efficient interventions, user fees and decentralization to improve efficiency and sector performance.

Table 5.4. Comparison of health expenditures per capita and the mortality rate in a number of selected Sub-Saharan African countries in 2006

	Health expenditure per capita (current US\$)	Mortality rate, under-5 (per 1,000)
Angola	71.0	158
Burundi	10.0	180.2
Cameroon	45.0	148.6
Central African Republic	14.0	173.9
Chad	29.0	209
Congo, Dem. Rep.	10.0	163.5
Congo, Rep.	44.0	124
Côte d'Ivoire	35.0	127.8
Gambia, The	15.0	111.6
Ghana	33.0	114.7
Guinea	20.0	154.8
Guinea-Bissau	12.0	200.7
Kenya	29.0	120.6
Madagascar	9.0	115.4
Mozambique	16.0	171.3
Senegal	44.0	116.15
Togo	21.0	103.1

Source: WDI 2008.

A comparison with several Sub-Saharan African countries, graphing child mortality rate (under five) with per capita health expenditure, suggests that Madagascar manages some of its resources in an efficient manner. As shown in Table 5.4, Madagascar’s health expenditure per capita amounted to US\$9 while having a child mortality rate under five of 115.4 (per 1.000 persons). Compared to a range of other African countries, Madagascar has succeeded in reaching one of the best outcomes on child mortality with

a limited level of public expenditures. Though it is difficult to know the exact reasons for this achievement, explanations for this could be sought in efforts by the Government to substantially improve many of the known determinants of child mortality over the same period (e.g. birth spacing, breast feeding, immunization, diarrhea treatment and Vitamin A supplementation), most of them being cost-efficient interventions.

The distribution of resources to the different health functions generally gives priority to the most cost-effective interventions to ensure health improvements, although allocations to maternal health programs remain low at less than 8 percent, according to the 2007 NHA. About 25 percent of all public resources managed by the MoH were spent on prevention services. Investments held the second most important share of financing at 19 percent and almost an equal share was spent on drugs. The share of resources allocated to the central level decreased from 20 percent in 2003 to 14 percent in 2007. Curative inpatient and outpatient care represent only 9 percent and 8 percent, respectively, of the total financing of the sector. This is, on the whole, in line with the health sector's priorities as half of resources were in fact used for outpatient care and preventive services that have been an integral pillar of the MAP. However, given that evidence on the ground shows that basic services remain severely underfunded and maternal and child health and family planning programs are an absolute priority, more resources should be dedicated to these programs.

Table 5.5. Distribution of MoH's resources according to health functions

MoH health functions	Percentage	Resources (US\$ million)
Hospital level care	9.21	34.33
Ambulatory care	7.66	28.55
Drugs	19.11	71.24
Preventable diseases programs	16.58	61.81
Mother and child health programs	7.88	29.37
Family planning programs	0.14	0.52
Central administration	13.92	51.89
Investment	19.45	72.50
Other	6.05	22.55
Total	100	372.77

Source: NHA 2007 preliminary results.

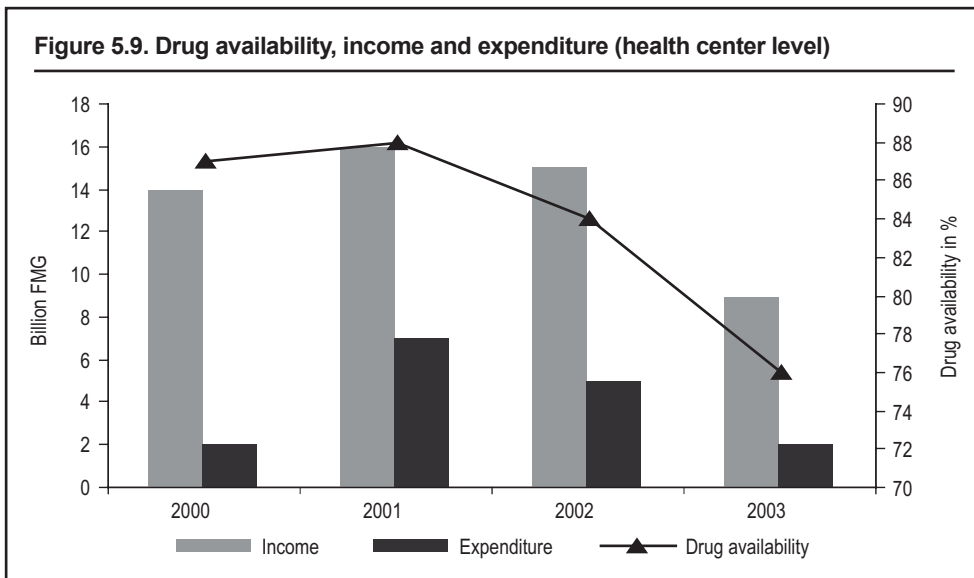
A well-designed, well-specified resource allocation formula can reduce government spending disparities across regions. These formulas also have an equity angle and can help ensure that the poor benefit from health spending. Moreover, there is the efficiency angle and resources can be diverted from areas where the marginal benefit is low (hospitals in Antananarivo) to where marginal benefits are higher (rural immunization programs or Mother and Child Health Weeks)—though this is often politically difficult to implement. As mentioned above, in Madagascar, such an allocation formula has not yet been developed.

The PETS, carried out in Madagascar in 2007, revealed a number of the inefficiencies in the system. For example, budget information was collected from district health authorities but it was often unclear whether the total corresponded with the budget

information consolidated at the central level. This reveals problems in the flow of information, possibly owing to outdated accounting practices, weak financial capacity at both the central and the decentralized levels but also the absence of checks on budget transfers between the central administration and the deconcentrated units.

Among the policies implemented by the Government to render the health system more efficient is the user fee policy for drugs. As mentioned above, the MoH introduced a cost recovery system (PFU), comprising of user fees for drugs at the health center level in 1998. Following the introduction of the PFU, the health facilities managed to accumulate a significant amount of funds over time as formal out-of-pocket expenditures increased substantially and MoH continued to finance drugs for public health facilities through SALAMA (Figure 5.9). However, with the suspension of user fees in the context of the 2002 political and economic crisis, utilization in health services increased but the income of the health facilities and availability of drug declined. Hence, the evidence suggests that the user fee system increased sectoral efficiency in Madagascar, though it also adversely impacted equitable financial access to health services by the poor. However, efforts are being made to address this through the establishment of equity funds in Madagascar's health system.

Decentralization of key functions is often advocated as a means of strengthening public sector management and improving overall health system performance. Each form of decentralization has different implications. Evidence suggests that decentralization improves the efficiency of the health system through: (i) improved technical efficiency as local governments are more cost conscious and have more freedom in contracting with providers; (ii) better allocative efficiency through greater alignment of services to the needs of the different communities; (iii) improved equity as local authorities know communities better and can successfully target resources to the more vulnerable groups;



Source: World Bank, Draft health Note, 2009; "Direction Pharmacie et Medicine traditionnelle," Salama.
 Note: Income is the cost recovery from outpatient services at the CSB and CHD level; expenditures are the costs of resupplying the drugs as well as the amount spent on pre-authorized items.

(iv) greater service delivery innovations through experimentation with different service delivery and financing models; and lastly (v) improved overall transparency and efficiency. A number of selected country experiences are presented in Box 5.6.

In the case of Madagascar, although regions and communes have become the focal point for country's decentralization strategy, it remains still highly centralized with less than 5 percent of expenditures spent below the central level. The communes have only few resources with local revenue collection amounting to about 2-3 percent of total revenues. However, with regards to deconcentration, the social sectors (health and education) are the most advanced in terms of allocating resources to the service delivery level compared to other sectors.⁶⁴ Despite these accomplishments, the health sector's budget management is still largely concentrated at the central level, even though this continues to slowly improve. The budget process is also becoming more decentralized and instead of the usual top-down methodology, health centers submit their budgets to the districts, where they are consolidated and then sent on to the regional and then the central authorities.

Decentralization in Madagascar must also take into account weaknesses in central government regulatory powers. International evidence clearly demonstrates that a necessary condition for effective decentralization is the availability of highly skilled local health care managers with adequate support staff and access to high-quality information systems.⁶⁵ In Madagascar, capacity constraints stemming from the lack of human resources and insufficient financial and accounting know-how at the regional and district level have limited the effectiveness of many decentralization efforts. The weakness of the central government's regulatory and supervisory capabilities means that the decentralization of service provision while potentially beneficial must be carried out progressively and with parallel efforts to strengthen central services responsible for policy definition and enforcement, and quality and fiduciary controls.

Box 5.6. Selected country experiences with decentralization

Decentralization leading to improved expenditure allocation across services. While the evidence related to the effect of decentralization on allocative efficiency is mixed, there are some examples of decentralization leading to improved expenditure allocation across services. In *Bolivia*, as part of the country's decentralization efforts since 1994, and in its allocation of newly available resources from debt forgiveness, the Government allocated funds to municipalities according to poverty indicators, with the mandate that municipalities spend such resources on specified health, education, and other social programs. A follow up analysis of the expenditure patterns showed that local government's better knowledge of local needs led to spending reallocations that improved access to health care services. In *Chile* and *Columbia*, health care budgets were devolved to provincial or municipal governments on the basis of a per capita formula adjusted for various factors. As a result of these decentralization efforts the gap in health expenditures across income deciles decreased.

Decentralization associated with some improvement in technical efficiency in services. In *Uganda*, decentralization provided district governments the freedom to contract with NGOs for service provision. The NGOs provided higher-quality care at lower cost in their facilities. They found similar results in *Cambodia*: NGOs proved more efficient at providing services—both in quality and quantity—than government facilities.

Source: World Bank, "Health Financing Revisited," 2006.

In recent years with the additional focus on achieving the MDGs, various tools have been developed to calculate the cost per capita to achieve the health-related MDGs. One such tool, the Marginal Budgeting for Bottlenecks (MBB), developed by UNICEF, WHO and the World Bank, was used in Madagascar to develop the last two health MTEF, 2006-2008 and 2009-2011. Since March 2004, 42 out of 111 district health authorities have received practical and theoretical training on using the MBB tool in planning and budgeting priority activities. The MBB model determines the additional resources required for removing a set of health system bottlenecks that hinder the delivery of essential health services, through family/community, outreach, and clinic delivery modes. The MBB also estimates the neo-natal, child and maternal mortality outcomes based on the increased use of health services that would bring the country that much closer towards achieving the MDGs. The approach can help make the case for increased funding by identifying the areas affording the most scope for significant impact on health outcomes at modest cost. In the case of Madagascar, it suggests that an additional US\$3.15 per capita, representing an increase of 63 percent over the current budget, is needed. Though useful as a conceptual approach, the realism of the analysis has yet to be confirmed in terms of actual outcomes.

The MoH in cooperation with partners identified and costed a minimum package of sustainable and cost-effective health services; but its implementation has been put on hold with the country experiencing a political crisis in 2009. The package aims to expand coverage of basic health services by focusing on maternal and child health. It also seeks institutional change on the supply side by providing performance-based bonuses to health service providers for the number of children and mothers reached with this package. The Government intends to deliver these services free-of-charge at national scale, which should increase demand and thereby utilization, bringing the country closer to achieving the MAP goals and the health-related MDGs. The package includes: (i) preventive services, such as immunization, micronutrient supplementation, and promotion of insecticide-treated bed-nets; (ii) promotion of health services, such as increasing prevalence of exclusive breast-feeding and use of family planning; (iii) basic curative services, such as treatment of acute respiratory tract infections, diarrhea, other childhood illnesses, and tuberculosis; and (iv) reproductive health services, such as prenatal care, emergency obstetrical care, and post-partum care.⁶⁶

Scope for Creating Fiscal Space

Although a key priority for the sector is to increase the efficiency and equity of health spending, it is clear that the current funding level compared to the sector's needs is too low. Comparing the 2009 health budget with the 2009-2011 MTEF, and despite notable increases in the budget since 2008 (by 20 percent in real terms), the total health budget still falls short of financing adequately basic activities and key sector reforms (including community participation, financial allocations and performance allocations at the decentralized levels, and a subsidized package of high-impact health services).⁶⁷

Once shortcomings in the sector's absorption capacity are addressed, larger increases in public health spending in the future could be considered, within the available fiscal space. In principle, Governments can create fiscal space for efficient and effective priority spending in the health sector in the following ways: increasing taxes and/or strengthening tax administration, reallocating expenditures from poorly performing or low priority areas, or borrowing resources from either domestic or external sources.

In Madagascar, despite the Government's efforts to increase tax collection, tax revenue continues to be low, at less than 12 percent of GDP prior to 2008, especially compared to Sub-Saharan African countries where the average is around 20 percent.⁶⁸ Non-tax revenue is also very low and represents only 0.3 percent of GDP which is surprising given the importance and recent expansion of the mining and forestry sectors. Creating fiscal space through tax measures is a longer-term measure as it depends on Government's overall efforts to carry out revenue reforms.

Budget reallocation is a difficult exercise as the marginal social benefits must equal the marginal costs, and expenditures need to be theoretically reallocated from unproductive public uses to more productive ones. Reallocation of expenditures often implies cutting expenditures to one sector for another. In Madagascar, budgetary allocations to the health sector increased by 20 percent in real terms in the 2009 budget law, but at the same time, the education budget declined as a share of the total budget (from 18.4 percent in 2008 to 17.7 percent in 2009) and almost no resources were allocated to water and sanitation and public works.⁶⁹

With regards to external or domestic borrowing, many low-income countries typically have a large debt burden, and only limited room for additional borrowing. A scaling-up of health services often requires increases in recurrent expenditures such as salaries, which should not be financed with debt but rather with regular sources of funding. Foreign aid is increasing, especially in the health sector. Development assistance for health plays an especially important role in Sub-Saharan Africa, exceeding 30 percent of health expenditures in 2000.⁷⁰ However, a high dependency of the national budget on external financing results in a number of risks and vulnerabilities, such as predictability of donor funds, off-budget financing, dependency on donor's program funding preferences, and accountability of program implementation.

Mechanisms are available to increase aid effectiveness, such as harmonization of donor aid. In the short-term, donor funding seems to be the main alternative for scaling up health expenditures. Yet, additional efforts are necessary to increase the effectiveness of donor aid, decrease volatility, and increase harmonization. Various mechanisms are in place to support this, such as IHP+ which is a renewed global effort to support countries in achieving their health MDGs with scaled up financial, technical and institutional support for activities and mechanisms designed to achieve results on the ground.⁷¹ A key element of the IHP+ is the development of results-focused, country-led Compacts that rally all development partners around one costed national health strategy, one monitoring and evaluation framework, and one review process. This comprehensive approach improves harmonization, alignment, the focus on results and mutual accountability.

Lastly, in addition to increasing expenditure, there are a number of other factors necessary for progress in the health sector, including broad-based income growth, improvements in infrastructure, higher literacy rates and a number of other factors that drive health outcomes.⁷²

Potential Impact of the Crisis on the Health Sector

The on-going political crisis since early 2009 has dramatically altered the country's economic performance and financing picture despite the past sustained positive development with improvements in economic, social and governance indicators in recent years.⁷³ Since the political unrest resulting in a change of government in March 2009, there has

been economic contraction, a rise in unemployment in key sectors and a disruption in social services. Estimates suggest that the GDP growth was negative in 2009 (projections prior to the crisis were at 7.5 percent).⁷⁴ According to a World Bank report in July 2009, the Government had only executed 20 percent of its budget as of end June,⁷⁵ compared to 35 percent by end June 2008. This low spending emphasizes the quasi-paralysis of public administration and the growing budget constraints faced by the Government, affecting sector performance across all ministries.

The financing of the health sector presents a mixed picture. In the case of the health sector, some evidence showed that during the first quarter of 2009 compared to the same period in 2008, increases in public investment spending occurred in the health sector, while public investment by other ministries in charge of social service delivery or infrastructure was marginal and much lower than in 2008. Moreover, the national recurrent budget was cut in 2009 by 23 percent while the investment budget is rumored to have been reduced by significantly more. Given the difficulties in downsizing the civil service, non-salary expenditures used to pay for drugs and other medical inputs are most likely to have been impacted by these cuts which in turn affect the quality of care. Moreover, budget cuts may have resulted in a hiring freeze of nurses and doctors in public hospitals.

Aid flows to the public sector have been severely cut by the decision of some donors to suspend or reduce their disbursements following the change in government and the initial volume of disbursements expected for 2009 and 2010 is unlikely to resume until an acceptable solution is found to the current political crisis. As a large share of MoH's investment budget is donor-funded, this puts a severe constraint on the funding of investment needs (e.g. equipment, medical supplies) at the primary health care and hospital levels. Other actors, such as NGOs, are also likely to face significant financial constraints with the withdrawal of the donors from the sector.

On the whole, this situation is greatly putting at risk the progress made in the health sector to date. Initial reports suggest that access to reproductive health services has been curtailed during the last months.⁷⁶ Most health centers and hospitals are faced with reductions or even depletion of their medical stock, equipment, and supplies—formerly provided by the Government. An evaluation of the impact of the crisis in the health sector carried out by the development partners flagged, among others, the deterioration in the delivery of basic health services, in particular in areas that are widely dependent on donor aid (such as for safe delivery, contraceptives and the prevention of transmittable diseases). Since health administrative data is not being regularly collected it has been difficult to access regular and accurate data from the peripheral levels. Equity Funds generally are not used, suggesting that the most vulnerable segments of the population continue not to use health services.⁷⁷

Current reduction in employment and income will most likely affect household's nutrition. Poor households, and other marginalized groups are hereby more prone to suffer as they have less room to re-adjust and cushion their expenditures, often leading to a decline in demand for health services.⁷⁸

Notes

1. World Bank, *Health Financing Revisited*, 2006.
2. World Bank, *Health Financing Revisited*, 2006.
3. The comparison was made with Burkina-Faso, Mali, Mozambique, Tanzania, Senegal, Namibia, Mauritius and Angola (World Bank, *Madagascar Understanding the 2009 Budget Law*, 2008).
4. The global cost of the PDSS implementation for the years 2007-2011 was estimated at US\$1.3 billion with a financing gap of US\$659 million.
5. Calculated by the MoH, UNICEF and other partners.
6. See also World Bank, *CAS for the Republic of Madagascar for FY 2007-2011*, 2007.
7. See Appendix 2, Table A2.1.
8. Commission for Health and Macroeconomics, WHO, 2002.
9. See Appendix 2, Table A2.2 and A2.3.
10. See Appendix 2, Table A2.4.
11. See also World Bank, *Madagascar Public Expenditure Review*, Volume II, 2006/2007.
12. *Health Expenditure Review*, 2006/2007.
13. Among the donors involved in the sector are the African Development Bank (AfDB), Agence Française de Développement (AFD), European Union, French Cooperation, Global Fund, GTZ, Japanese International Cooperation Agency, Principality of Monaco, Royaume du Maroc UNICEF, UNFPA, USAID, WHO, and the World Bank.
14. See Table A3.5 on donor aid in Appendix 3.
15. Joint Health Sector Support Program (JHSSP) for a total amount of US\$82.5 million.
16. The high execution rate of 143 percent in 2004 can be explained by an overall high execution rate of the national budget (around 110 percent).
17. Note: the MFB figures are the official execution figures (the breakdown of the externally funded investment budget is only available from December 2008). These figures were revised by the MoH taking into account a number of budget errors; however these are not the official execution rate figures.
18. Section 152(1) requires the Minister of Finance to submit, not later than eight months before the end of the financial year, a 'Budget Framework Paper' to the Office of the President outlining the draft preliminary constraints for the next budget period.
19. MSPF, *Appui Technique pour l'amélioration du processus budgétaire du MSPF—Revue comparative, recommandations et Plan d'action*, August 2008.
20. The budget classification system divides hereby expenditures into mission (cross-cutting broad objectives) and programs. Each program consists of a clear set of objectives, related activities necessary to achieve those objectives and expected results.
21. The investment budget that is funded by donor aid is not subject to the trimester regularization, only counterpart funding and certain taxes (TVA, etc).
22. For example in 2008, only 23 percent was allocated for execution in the first quarter, 49 percent for the second, and 73 percent in the third.
23. The report highlighted that the execution rate of the last quarter in 2007 (69%) was below the respective 2008 last quarter budget ceilings (80 percent) (Demangel, P., *Appui à la maîtrise du budget de programme et de la fonction budgétaire centrale*, January 2008).
24. The SIGFP can enable prompt and efficient access to real-time financial information and help strengthen government financial controls, improving the provision of government services, raising the budget process to higher levels of transparency and accountability, and expediting government operations.
25. The progress report includes an evaluation of program objectives and results.
26. The implementation of the domestically financed budget is subject to regularization on a tri-semester basis. In 2008, the Ministry of Finance augmented the commitment ceilings of recurrent and investment expenditures for the MoH to increase the Ministry's budget execution.

27. The main reason for this excessive oversight and approval requirements is red tape and ineffective administrative procedures, which according to independent evaluations does not translate into higher quality of services. (See World Bank, Madagascar Fifth Poverty Reduction Support Credit, 2008).
28. Banque Mondiale, "Mesure de la Performance de la Gestion des Finances Publiques en République de Madagascar—selon la méthodologie PEFA," Version provisoire, Mars 2008.
29. MSPF, *Appui Technique pour l'amélioration du processus budgétaire du MSPF—Revue comparative, recommandations et Plan d'action*, August 2008.
30. The coaching team was made up of staff from the DAAF and from the procurement unit.
31. World Bank, *Analyzing Health Equity Using Household Survey Data*, 2008.
32. As highlighted by the 2006/07 Madagascar Health PER, due to the lack of information concerning the geographic distribution of medicines and investment expenditures, it is not possible to assess whether these expenditures are distributed in an equitable way.
33. Globally political pressures, corruption and other factors at times generate incentives to use increased health resources where they are not the most needed, e.g. subsidies for hospitals and health centers in urban areas, sophisticated equipment, or specialized medical institutes.
34. Preliminary Report, National Health Accounts 2007.
35. See Appendix 2, Table A2.6.
36. 2006/07 Madagascar Public Expenditure Review.
37. See Appendix 2, Figure A2.1a and A2.1b. Also see Human resources discussion in Chapter 3.
38. A field visit was carried out during a comparative study on the budget process of the Ministry of Education and highlighted that most health centers do not know their budget envelope. Regional Directorates are often informed about their available resources only once the completed works are presented during the reception ceremony. The assessment also showed that two regions had transferred the implementation of its investment budget to the central administration as they did not have the capacity to implement it. (See MSPF, *Appui Technique pour l'amélioration du processus budgétaire du MSPF—Revue comparative, Recommandations et Plan d'action*, 2008).
39. EPM 2005.
40. The EPM 2005 shows that the cost of receiving care is the main reason reported for non-utilization of services in case of illness.
41. Banque Mondiale, *Analyse de la Pauvreté et de l'Impact Social—les Soins de Santé et les Pauvres*, Février 2007.
42. Minten, B. and Ralison, E., "Price and Welfare Dynamics in Rural Madagascar," First Draft, January 2005.
43. Estimated at 5 percent of the population.
44. World Bank, *Madagascar, Poverty and Social Impact Analysis of Health Care and the Poor*, 2008
45. Antananarivo Renivohitra.
46. World Bank, *Risk Management and Social Protection Strategy*, July 2007.
47. World Bank, *Madagascar, Poverty and Social Impact Analysis of Health Care and the Poor*, 2008.
48. World Bank, *Risk Management and Social Protection Strategy*, July 2007.
49. World Bank, "Risk Management and Social Protection Strategy," July 2007.
50. Ibid.
51. World Bank, "Health Financing Revisited," 2006.
52. Ibid.
53. Ibid.
54. World Bank, "Risk Management and Social Protection Strategy," July 2007.
55. World Bank, "Health Financing Revisited," 2006.
56. World Bank, "Making Work Pay in Madagascar—Employment, Growth and Poverty Reduction," 2008.
57. World Bank, "Madagascar—Assessing Labor Market Conditions in Madagascar 2001-2005," June 2007.
58. World Bank, "Health Financing Revisited," 2006.
59. World Bank, "Risk Management and Social Protection Strategy," July 2007.

60. Medical Care Development International, "Child Survival Project Mid-Term Evaluation—Toliara Province," October 2005.
61. World Bank, "Risk Management and Social Protection Strategy," July 2007.
62. World Bank, "Health Financing Revisited," 2006.
63. Ibid.
64. World Bank, "Public Expenditure Review," 2007.
65. World Bank, "Health Financing Revisited," 2006.
66. See also Box A2.1 in Appendix 2 that presents a list of programs, forming part of the minimum package.
67. The approved budget for 2009 does not meet the total estimated needs of the conservative scenario (based on the financing of the most basic activities), with a difference of about MGA 45 billion. For the second scenario (based on the financing of basic activities and some sector reforms), the difference is even greater at MGA 106 billion. (See Annex 2, table 7.)
68. World Bank, "Madagascar Fifth Poverty Reduction Support Credit," 2008.
69. World Bank, "Madagascar: Understanding the 2009 Budget Law," 2008.
70. World Bank, "Health Financing Revisited," 2006.
71. Madagascar became a member country for the IHP+ in May 2008, which could help the country to mobilize more donor funds if in fact the Government continues to focus on developing the Country Health Compact.
72. World Bank, "Health Financing Revisited," 2006.
73. See World Bank, "Country Assistance Strategy for the Republic of Madagascar 2007-2011," March 2007.
74. World Bank, "Madagascar, Economic Update," May 2009.
75. World Bank, "Madagascar, Economic Update—unexpected but fragile stability in the economy," July 2009.
76. United Nations, "Humanitarian Situation in Madagascar," 6 May 2006.
77. World Bank, "Sustainable Health System Development Project—Aide Memoire of the supervision mission," August 2009.
78. See also World Bank, "Protecting Pro-poor health services during financial crisis—lessons from experiences," 2009.

Strengthening Accountability in the Health Sector

This chapter outlines the dimensions of accountability in the health sector, including financial, performance and political, assesses the performance of the health sector in these three areas and reviews the Malagasy experience with social accountability and governance tools.

The Importance of Accountability for Health

While accountability in service provision is crucial for all types of public services, it is particularly challenging in the health sector. The health sector is especially prone to a lack of governance, given certain sector-specific characteristics, such as information asymmetries, moral hazard issues and the complexity of the sector in terms of the large number of different actors involved.¹ Furthermore, weak public financial management and corruption at many levels of the health sector is an important dimension of governance. Therefore, proper accounting for the use of health care spending is a high priority² given the need for financial accountability mechanisms required for donor investments. In many low-income countries in Sub Saharan Africa (SSA), overseas development aid constitutes a substantial share of the budget for health and Madagascar is no exception. Thus, improving financial accountability is essential for attracting external financing for health. Moreover, capturing the effectiveness of public and private health care services, the extent of corruption or financial mismanagement and the degree of downward accountability to the client pose serious challenges. In most SSA countries, information on performance indicators is scarce, and difficult to aggregate where it exists. Moreover, the highly variable and unpredictable nature of health care demand, the myriad of actors involved in service delivery and the limited choice of instruments for monitoring, all contribute to the challenge of defining and measuring governance in the health sector.³ However, one relatively simple framework for assessing accountability was developed by Brinkerhoff and Keener, and applied to Madagascar in 2003.⁴ This chapter updates the original analysis, applying the key characteristics of the model to the current situation in Madagascar.

Accountability encompasses three dimensions: financial, performance and political/democratic. Accountability involves the obligation to provide information about use of resources, performance, and/or results as well as enforcement, or sanctions (both positive and negative) applied to responsible actors. Accountability seeks to: (i) reduce abuse, financial mismanagement, and corruption; (ii) ensure compliance with procedures, standards and policy objectives with regard to resource use; and (iii) improve

performance, learning, and citizen empowerment.⁵ The interaction between the three accountability dimensions and purposes is presented in Table 6.1. While some activities are unidimensional, there exist multidimensional interventions.⁶

Table 6.1. Accountability categories, activities, and purposes

Categories	Activities	Purpose
Financial accountability	<ul style="list-style-type: none"> Track and report on allocation, disbursement, and utilization of financial resources; Cost accounting/budgeting for: personnel, operations, equipment/supplies; Define of basic benefits packages; Contract oversight. 	<ul style="list-style-type: none"> Control and assurance are dominant; Focus is on compliance with prescribed input and procedural standards; cost control; resource and efficiency measures; Elimination of waste, fraud and corruption.
Performance Accountability	<ul style="list-style-type: none"> Demonstrate and report on activities, achievements, results, and outcomes; Assess quality of service provision; Monitor and evaluate service provider behavior; Ensure regulation by professional bodies; Provide and monitor Minimum Service Standards; Contracting out. 	<ul style="list-style-type: none"> To assure that service delivery adheres to the legal, regulatory, and policy framework; that services are delivered according to quality norms, standards and values; To improve performance by comparing with best practices and evaluating against them.
Democratic/Public Accountability	<ul style="list-style-type: none"> Assure service delivery equity/fairness; Disseminate information and notify citizens of rights and responsibilities (transparency); Responding to citizens' needs and demands, either directly or through elected representatives; Building citizen and service user trust. 	<ul style="list-style-type: none"> Control relates to citizen/voter satisfaction, use of taxpayer funds, addressing market failure and distribution of services (disadvantaged populations); Assurance focuses on principal-agent dynamics for oversight; availability and dissemination of relevant information; adherence to quality standards, professional norms, and societal values.

Source: Adapted from Brinkerhoff, 2004, based on the model by Brinkerhoff and Keener, 2003.

Governance and Accountability in the Malagasy Context

Aggregate Governance and Corruption Indicators for Madagascar

Madagascar’s governance ranking had improved up until 2008 and was higher than most low-income countries. The World Bank Institute’s governance indicators, which are used by the Government to measure progress of governance reforms, place Madagascar ahead of most low-income countries, especially on controlling corruption. These governance indicators are a measure of six dimensions of governance:⁷ (i) voice and accountability, (ii) political stability and lack of violence, (iii) government effectiveness, (iv) regulatory quality, (v) rule of law, and (vi) control of corruption. These indicators, particularly the second and third ones, are likely to be rated differently in the next round of assessments.

Madagascar’s progress until the crisis was also supported by its 2008 Country Policy and Institutional Assessment (CPIA) scores. The World Bank CPIA ratings, performed on an annual basis, cover a set of 16 criteria, grouped into four clusters: (i) economic management, (ii) structural policies, (ii) policies for social inclusion and equity, and (iv) public sector management and institutions.⁸ Within Africa, Zimbabwe ranks lowest, with a rating of 1.2 and Ghana is amongst the better IDA performers, with a score of 4.4. For 2008, Madagascar’s overall score was 3.6, with the quality of public administration, accountability and transparency in the public sector rated 3.5.

However, Madagascar's Corruption Perception Index decreased between 2008 and 2009, although it had improved overall since 2005. One indicator that captures the initial effects of the crisis is the Transparency International's Corruption Perception Index estimated for 2009. This assesses the effectiveness of anti-corruption efforts and Madagascar's rating of 3.0 ranks it 99th out of 180 countries. While this rating has improved overall since 2005 (2.8), this represents a decrease from 2008 (3.4).⁹

Governance improvements up to 2008 are in part attributable to Government's efforts to fight corruption and improve transparency since 2002. As part of these efforts, the Government passed anticorruption and anti-money laundering legislation, adopted clear rules for public sector recruitment, and required elected and public officials to declare their assets. It also created an independent Anti-corruption Commission and an anticorruption agency, *Bureau Independant Anti-Corruption* (BIANCO). This agency has investigated allegations of public official corruption and spearheaded audits of large investments by public officials. However, challenges in terms of governance remained; BIANCO was said to be less effective outside large cities and outside of Analamanga region, and the continuation of a highly centralized political system worked against improving the voice of those outside the capitol in national dialogue.

The Government also recently implemented a number of important reforms aimed specifically at improving financial accountability in the health sector. These efforts include the implementation of a new information system for accounting and procurement, and the creation of the Medium Term Expenditure Framework (MTEF) for 2009-2011 in a participatory manner involving sub-national actors. In addition, specific mechanisms to facilitate the execution of donor funds were put in place.¹⁰ Uncertainty about future reforms and the sustainability of the most recent ones persists given the current political instability. Thus, despite progress in health sector accountability, the unfinished agenda remains substantial and the following sections will assess these challenges.

Financial Accountability for Investments in Health

Negative perceptions regarding the levels of corruption in the public health care system, and findings from the most recent public expenditure tracking survey (PETS) point towards a myriad of problems hindering financial accountability in the sector. These problems include inadequate planning and budget practices, weak budget implementation and ineffective reporting structures at all levels of the system. Tools related to non-financial supervision and the monitoring of outcomes are discussed in the next section on performance accountability.

Despite recent legal changes, health sector financing in Madagascar remains largely controlled by the central authorities. In 2007, to improve the availability of financial resources at the level of local governments, the authorities increased the share of certain taxes in favor of the communes in the Finance Law.¹¹ As a result, resources were allocated to the regions in 2008 for the first time, making them responsible for the implementation of a small part of the investment budget. This, however, amounts to increased deconcentration rather than fiscal decentralization, given that lower levels are responsible for the implementation of funds, but have relatively little discretion on how to allocate these resources. Regional heads remained named by the Executive to which they are also still in a large part accountable.

At district, commune and provider (hospital and clinic) level, discretion for health spending is still limited. At the district level, there is some choice over how to spend

the limited non-salary recurrent budget (around 19 percent of total MoH budget). Communes are further allowed to allocate additional resources to primary health clinics as they see fit. Even NGOs can offer resources and personnel to MoH facilities. Overall though, it appears that less than 5 percent of expenditures are executed at lower levels in Madagascar. Moreover, most communes have few resources for potential additional investments, with local revenue collection amounting to about 2-3 percent of total revenues, although the latter could increase with changes in legislation concerning taxation.¹² At the provider-level, public hospitals have recently been given some autonomy and can charge for services, but mostly remain dependent on subsidies from the central government (financial and in-kind, drugs and medical supplies). However, hospitals have no discretion in setting the fees for services.

Moreover, the current allocation formula for health resources does not take into account demographic and socio-economic differences across regions. As a result, large regional disparities remain in the allocation of the recurrent budgets, and the actual distribution benefits richer regions. The 2007 Madagascar PETS also highlighted that the percentage of resources allocated to the functioning of health centers by the District Health Services is minimal and some districts do not make any transfers.¹³

Despite the introduction of promising reforms in planning and budgeting at all levels of the health system, at present results are limited. While the introduction of programmatic budgeting at all levels creates opportunities to more specifically tie spending to performance, and leaves room for greater flexibility in shifting expenditures across categories, problems remain. In particular, central planning is still performed separately for the recurrent and investment budgets, which limits the actual usefulness of the Medium Term Expenditure Framework. Moreover, as yet there is no global MTEF in Madagascar, the effectiveness of the MTEF as a planning tool in the health sector is somewhat reduced.

At the regional level, Annual Work Programs are not yet used as tools to improve resource allocations and efficiency, but tend to reflect trends in spending from previous years. In 2008, the MoH carried out a consultation process with regional units regarding the draft 2009 budget. District health authorities were included in the process and participated in the preparation of the MTEF 2009-2012.¹⁴ Each health center draws up an Annual Work Program based on projected expenditures for the next year. These reports are submitted to district authorities, consolidated and subsequently reported upward to the regions, the MoH and other central agencies.

Spending resources in the health sector in Madagascar is a complex undertaking. Budget execution in Madagascar is a complicated process, and the many procedures involved not only burden central and local executive agencies, but can also substantially affect the degree of financial misuse. Despite efforts to simplify the execution process, it remains difficult to carry out timely commitments against the budget at the beginning of the fiscal year ultimately affecting the levels of funds spent. At the regional and district levels, Annual Work Programs are often not implemented on time because funds are insufficient and/or arrive with delays from the central level while technical capacity to manage big procurement contracts of equipment and large quantities of commodities is inadequate. For example, delays in authorizing annual operating budget credits in the past years have reportedly forced some district health offices to rely on those suppliers who would provide goods on credit, thus eliminating the competitiveness of bids and price quotes.¹⁵

A key financial flow that is generally unaccounted for are informal payments, but little is known about the extent to which such payments affect the Malagasy system.¹⁶

These types of payments create a parallel market for services within the system, and in Madagascar, they are illegal and can be considered a form of corruption. Generally, when user fees are present, it can be complicated to identify such practices since user fees make it difficult to differentiate between official co-payments, gratitude payments, and informal payments or bribes.¹⁷ Since the introduction of the cost recovery system (FANOME), however, the focus has shifted to reporting and monitoring of revenues of drug sales. Furthermore, assessing the extent to which informal payments are present is complicated by the fact that the accounting system focuses on the resources given from the center, rather than from communities.¹⁸ Global studies have, however, found the extent of informal payments to be rampant in the health sector, particularly in Southern Saharan Africa.¹⁹ While up to date information on the extent of such payments in Madagascar is not available, previous studies have documented the common practice of health centers charging consumers higher than official prices for medicines or services.²⁰ As documented in a 2007 PSIA, this can also occur when doctors see patients at their home after hours or when they sell different drugs from their home that they say are not available in the clinic.²¹

The introduction of the computerized information system, the SIGFP, designed to streamline reporting on health spending and output, is a promising development. However, the system has faced a number of constraints in its implementation,²² in particular at the regional level as local government is only connected to the system in a few regions. Moreover, information technology capacity is lacking particularly at the peripheral level, delaying the budget commitment process and the flow of information required for effective procurement. Since 2008, information technology support has been provided to some districts to facilitate the transmission of information. Limited information is available about the effectiveness of these new support efforts. Findings from the 2007 PETS, undertaken prior to the introduction of the new system, highlighted the difficulty in aggregating local spending reports nationally. Thus the system should help to address this problem. Finally, financial reporting accountability in the Malagasy health sector is unidirectional, and information flows upward, and rarely downward in the form of feedback to the health provider level or the community. Communities are not informed of the norms of service (hours, personnel, medicines that should be available, pricing), or where to go if problems arise, and there is as of yet no formal mechanism for higher levels in the Ministry to systematically review how users evaluate the system's performance. This limits community and provider opportunities to provide inputs regarding the current mechanism and potential solutions to improve reporting practices.

Monitoring accuracy of available reporting is crucial to improving accountability and reducing leakages, but is limited in practice. Most district health authorities simply lack the capacity or the time to review and verify health center reports. Moreover, many health facilities are difficult to reach regularly because of lack of road access.²³ This combined with the lack of any independent monitoring by communities, or verification of reports, can create fertile ground for inefficiencies and leakage. Although performance-based budgeting (based on programmatic budget principles) is being implemented across districts in Madagascar, it remains unclear whether the information is truly used to modify budgets and plans in the future, and whether targets are accurately evaluated.

Given the limited oversight from district authorities on the achievements of targets and outcome indicators, the lack of bottom up verification of those targets, there is little incentive for health providers to accurately report on these issues.

Accountability for Pharmaceuticals

Leakages in the pharmaceutical supply chain and problems regarding the accounting of the FANOME are important concerns.²⁴ These issues were explored in greater detail in the 2006/2007 PETS that had two survey rounds in November 2006 and May 2007 (Box 6.1).

Averaging across survey rounds, 73 percent of health center level pharmacies report leakage in the supply chain from district to commune levels. For the country as a whole, leakage of at least one drug was reported in 66 percent of the health center level pharmacies in November 2006, and 80 percent in May 2007. Provincial variation was clearly noted: leakage was lowest in Fianarantsoa (about 50 percent of pharmacies experienced leakages); and highest in Mahajanga (81 percent of pharmacies reported discrepancies). In addition, pharmacies associated with type II health centers²⁶ appeared to suffer less from drug leakages, especially in the first survey round.

Leakage was further found to vary substantially across drug types. In particular, half of the health center level pharmacies that ordered antibiotics did not receive what they were supposed to receive. Value/price leakage of antibiotics is more prevalent than quantity leakage, but both types of leakage often occur at the same time.²⁷ On average, 49 percent of the health centers that ordered antibiotics during either survey rounds suffered from value/price leakage and 34 percent suffered from quantity leakage.

Box 6.1. Accountability of FANOME and drugs for the poor

An important change in Madagascar's health sector was the introduction of the cost recovery policy, FANOME and the creation of the Equity Fund to subsidize drugs and services for the poor. More details on the program were discussed in Chapter 3. This box focuses on the accountability issues regarding the program's targeting, management and oversight.

Targeting: With respect to the identification of program beneficiaries, current procedures create opportunities for fraud, given that many of the created Community Management Committees responsible for beneficiary selection, do not provide information on how the process is undertaken. The PETS 2006/2007 indicates that in 22 percent of the cases, the communes reported that the beneficiary list was created in an unspecified way, highlighting accountability issues around targeting. In many districts, mayors play an important role in the finalization of the beneficiary list, while this is not part of the formal procedures. However, regardless of the ambiguities in the procedures for targeting, the latest PSIA showed that there was no evidence of favoritism or fraud in the selection of the beneficiaries.²⁵

Management and Oversight: The Community Management Committee, appointed by the local Health Committee, is responsible for producing monthly reports, keeping an inventory of medicines and supplies, preparing reports on revenues and expenditures and holding receipts and financial reports. The health center is responsible for the preparation of consolidated reports while the members of the district management health teams undertake periodic supervision. While survey results indicate that the large majority (91 percent) of health centers have accounting documents for the use of FANOME funds, only a quarter of health centers had publicly posted the use of the funds, which violates the requirement for posting, a requirement designed to promote transparency and accountability.

A World Bank study²⁸ on service provision in health in Madagascar analyzed the PETS through multivariate analysis, and the key findings are summarized here:

- *Health centers with a more educated director or a director born in the region, experienced more antibiotics leakage.* A director operating in his native district is likely to have more informal connections than a newcomer, and while his social capital could be an incentive for him to perform well,²⁹ results suggest the opposite. This is consistent with findings from other studies regarding local elite capture,³⁰ although results are not necessarily significant over both survey rounds, and should be interpreted as mere associations.
- *Health centers with more active management had more antibiotics leakage.* Health centers that had a meeting with the Community Management Committees during the prior six months experienced more antibiotics leakages in November 2006. It is plausible, however, that rumors or evidence of leakage increased attention to the problem and led to meetings with the committees, indicating possible endogeneity problems regarding these results.³¹
- *Health centers whose medicine dispensers were paid more irregularly, experienced more antibiotics leakages.* The health center medicine dispensers play a key role in the supply and administration of drugs at the health center pharmacy level³² and are paid by the commune through a Government subsidy.
- *Remote health centers experience more antibiotics leakages, while results regarding communities' average income or literacy rate remain ambiguous.* Communes with a higher average literacy rate experience more antibiotics leakages. This is not consistent with the expectation that more educated beneficiaries might be able to better monitor leakage, and thereby reduce it. On the other hand, however, health centers serving wealthier communes experienced less leakage in that same round.³³

The reasons for these governance issues relate mostly to weak capacity for accurate accounting and poor monitoring of accounts. While diversion of private gain may be one of the possibilities, due to delays in payments of drug dispensers or adequate compensation levels, it is important to note that absence or lack of observance of proper accounting procedures or training at the various levels allows for the presence of such issues.

Performance Accountability in the Health Sector

Performance accountability concerns accountability of public and private policymakers and service providers with regard to the policies and outcomes they set. They are also responsible for adherence to minimum service standards, as well as the extent and level of services they are legally committed to provide. Performance accountability therefore relates to sector monitoring through supervision and human resources planning and management. Incentives are important for improving performance accountability, and these will be examined in the Malagasy context.

Health services are to be provided in conformity with norms and standards set by the MoH, but monitoring compliance is limited. These norms are strict and technically defined by the central Departments. In addition to norms and standards, these Departments are also involved in direct management and organization of certain service activities, such as national vaccination days or specific training activities, and including logistics and supplies for services. However, these Departments tend to intervene in local administration in vertical and uncoordinated ways. At the same time, there is no clear

evidence that they improve monitoring and evaluation of the performance of locally provided services or programs. At present, the information system does not yet provide complete and reliable information in a timely manner needed for adequate monitoring of district activities.

Supervision is a key component of sub-national monitoring but the frequency and quality varies. At the district level, performance is monitored through mechanisms other than written reports, including field supervision visits and monthly meetings between the district health office and health center heads. The Doctor Supervisor or district health office head is responsible for undertaking quarterly supervision visits to all health facilities within his jurisdiction to carry out a performance evaluation.³⁴ Generally, visits to service providers involve a number of assessments, ranging from verification of accounting/financial records and medical supplies to the assessment of the physical infrastructure. Vaccination and patient records are also routinely reviewed, and an evaluation of whether national guidelines and norms are being followed should be carried out. These visits are also important for the health staff at the provider level, because it is an opportunity to communicate directly with the district level, share problems, and seek advice. Visits could further allow for staff to receive feedback on progress of the health center relative to others in the district and generally for workers to voice the needs of the health center directly.³⁵

Around three-quarters of health centers received a supervision visit during the previous year according to the 2007 PETS, but monitoring decreased over time (the percentage that had received such a visit fell from 84 percent to 71 percent between the two rounds).³⁶ There is also some variation across the different types of health centers with regard to monitoring of operations and performance. In particular, the supervision of type I health centers could be improved. The central province of Antananarivo had the highest supervision rates as over 90 percent of the health centers had been visited. This compares to as low as 76 percent in other provinces in the first survey round, and as low as 50 percent in the second survey round (Table 6.2). This likely related to lower density levels and greater difficulty to access certain regions compared to others. Overall, type I health centers receive less supervision than their type II counterparts. Moreover, there is some anecdotal evidence that health clinics that are farther from the District capital are less likely to be supervised.

Table 6.2. Proportion of CSBs supervised

	June 2006—Nov. 2006	Dec. 2006—May 2007
Type of CSB		
Type I	72	59
Type II	90	78
Province		
Antananarivo	96	91
Fianarantsoa	79	71
Toamasina	76	83
Mahajanga	82	50
Toliara	90	58
Antsiranana	88	63
Madagascar	84	71

Source: PETS 2007.

While health center heads in all districts are required to attend monthly meetings that include financial reporting and programmatic/technical oversight, information on regular attendance is limited. At these meetings, the health center's monthly activity reports, submitted to the district health office, are discussed and questions raised are answered. District health staff use the results of these meetings to prepare the monthly reports sent to the central level. It is likely that changes will occur in this monitoring system now that most health centers and districts are to digitize their reporting systems with the introduction of the SIGFP.

Management of human resources for health, another dimension crucial for performance accountability, is highly centralized in Madagascar. The key responsibility for recruitment, deployment and the promotion of health workers rests with the central government. The management of public service health workers is regulated by a single law, and its rigid rules limit the ability of the MoH to hire and fire personnel, as other central Ministries decide on these matters.³⁷ The MoH has no authority to neither change individual salaries, nor change the general salary rules, which remains in the hands of the MFB. The regional authorities, however, do have choice over transfer of staff within the region. The Human Resource Department processed 1,392 transfers in 2008 out of a total of 16,000 MoH employees. Recruitment levels vary year to year and depend on negotiations with the MFB and are subject to a general government recruitment limit. In 2008, MoH recruited 1,112 persons, of which 862 were front-line health care providers. However, 124 service providers retired in 2008, and 47 percent of current health personnel is estimated to retire within the next ten years, so current shortages in health workers are likely to be exacerbated unless policies are substantially adjusted.

Given the centralized nature of human resources management, district health offices have limited ability to address performance issues, since salary matters related to performance are beyond their responsibility. However, a key tool in ensuring adequate level of service quality entails the ability to provide feedback and hold health workers accountable for their (in)actions. For nurses and other paramedical staff, the head of the district health office has more direct power to hold them accountable for non-performance because of his/her status as a doctor vis-à-vis medical personnel in a more subordinate category. In general, most disciplinary activities are initiated at the regional level but reviewed at the central level. In 2008, 35 disciplinary actions were filed against health care providers, 24 of them were medical doctors.

Absenteeism rates for health workers are below those of many other Sub-Saharan African countries, but its presence can nevertheless undermine service delivery.³⁸ Absenteeism of health workers remains a chronic problem in some areas, and can severely limit patient access, reduce quality and suggests corruption.³⁹ These impacts of absenteeism are further exacerbated given that Madagascar already lacks adequate numbers of qualified health personnel, especially nurses and midwives. With 33 nurses for 100,000 people in Madagascar, the ratio of nurses to population is one of the lowest in the region.

In Madagascar, on average 19 percent of health workers are absent according to the Absenteeism⁴⁰ Survey in 2006/07 which is lower than the 35 percent health worker absence rate found in the 2006 multi-country study on absenteeism. **However, taking into account both survey visits performed, and considering a health worker as absent**

if s/he was absent during one of both visits, one-quarter to one-third of health personnel was absent during at least one of the two visits (Table 6.3). Results differ depending on the definition of absenteeism, but between 14 to 22 percent of health workers were absent during a random visit.

Table 6.3. Proportion of health workers absent at the time of the surveys, 2006/2007

	Visit 1 (Nov. 06)		Visit 2 (May 07)		Either visit 1 or 2	
	Basic	Extended	Basic	Extended	Basic	Extended
All health workers	19	21	14	22	27	36

Source: Absenteeism Survey 2006/07, Madagascar.

Absenteeism is higher at the type II health center level, and although not statistically significant, there is some provincial variation. Interestingly enough, the basic results do not suggest that health worker absence rates are higher in poorer or remote regions. What appears striking though is the fact that civil service health workers appear to be absent more often (31 percent) compared to contract health workers (20 percent) if both visits are taken into account.

Analysis by the type of provider further indicated that absenteeism in public settings is a little higher than in private for-profits, although private not-for-profit providers have the highest absenteeism rates. This pattern holds in rural as well as in urban areas in Madagascar and for all types of health workers. For doctors in particular, absenteeism in levels in private not-for-provides were high, with a little over 30 percent of doctors being absent, compared to 19 percent of doctors being absent at public providers.⁴¹

Absenteeism occurs for various reasons, many of them legitimate or necessary. For example, rural health workers often need to travel to larger towns to receive their paycheck, fetch supplies or drugs, or are delayed by poor infrastructure. On the other hand, some staff have other commitments or preferences and therefore, are not present during service hours. Overall, an important determinant of health worker productivity and presence relates to financial and non-financial incentives. Here, reasons for absenteeism in Madagascar are examined, with a special focus on payment methods and other performance incentives.

According to the Madagascar Absenteeism survey, the majority of health workers was absent due to missions, authorized leave, illness or to collect their salaries.⁴² Approximately one-fifth of health workers were on unauthorized leave (Table 6.4). About 28 percent of the health workers were on an official mission, including activities such as official meetings, field visits, and training. Overall, 8 percent were absent to collect salaries at district level. On average, health personnel are absent for one up to two days per month to collect their salary, with the problem especially acute in Toliara and Mahajanga. About 16 percent of health workers were absent because they were ill and 22 percent were on authorized leave. What is particularly worrying for service delivery is that there is no real system in place to replace workers when they are absent from the health center: 54 percent of workers are not replaced when they are absent.

Table 6.4. Reasons for absenteeism, 2006/2007 (as stated by health center director, in percent)

	Visit 1 (Nov. 06)	Visit 2 (May 07)	Either visit 1 or 2
Health worker left to pick up his/her salary	13	2	8
Health worker is on another official mission	29	28	28
Official job besides work at center	1	2	2
Illness	21	11	16
Authorized absence*	27	16	22
Unauthorized absence	8	35	21
Health worker is suspended	1	1	1
Health worker resigned	0	5	2
Total	100	100	100

Source: World Bank/UNICEF, PETS 2006/2007, Madagascar.

*This category includes people who have political obligations as organizing local elections etc. *Authorized absence other than official mission or salary pick-up.

Multivariate analysis indicates that higher educated health workers (doctors and mid-level managers) are absent more often. On the contrary, health workers that reside in the commune for several years or who live in housing provided by the health center are absent less often. These results are important in that they control for confounding factors, such as education and age of the health worker, whereas the other results provided above, are reasons given by the health center director for absenteeism.

While incentives appear to be important determinants of absenteeism, the results indicate that (current) financial incentives might be less effective than in-kind ones like housing. The findings from the absenteeism survey can have important implications regarding the potential of payments to function as incentives for health worker productivity. Given that health workers with higher levels of education and those that are older are also the ones that have higher employment status, and thereby higher earnings, this finding implies that higher salaries are not necessarily associated with lower absenteeism. In addition, it was initially assumed that contract workers, not subject to civil service protection, would have more incentives to perform well and be productive because they lack job security. While the descriptive results seemed to support the hypothesis, multivariate analysis controlling for education and age of the health workers (and therefore, to a large extent, salary) shows little difference in absenteeism rates between civil service and contract health workers. At the same time, in-kind incentives appear to make a difference, since the survey results indicate that those workers living in housing provided for them have statistically lower absence rates: they have about a 12 percentage points lower likelihood of being absent. Moreover, the results also show that the likelihood of absenteeism decreases with the years that a health worker has lived in the facility's commune.

Type II health centers could have higher absenteeism rates because of greater earning opportunities in their areas, as they are usually found in more populous locations. This implies that although salaries as such might not affect absenteeism, earning potential and the lack of accountability mechanisms regarding the presence of health workers may affect the number of days they staff their centers. Only about 35 percent of the health staff was in possession of an index card that stated their presence at the time of

the visits and in 42 percent of health centers, such index system did not exist. In the case of authorized absence, the enumerators could only verify documents in about one-third of the cases, with no documents in almost half of the cases, and in another 20 percent, documents existed but could not be verified.

Recent initiatives aimed at improving health worker productivity are promising, but linking payment to performance requires close monitoring and evaluation. Recently, programs have been introduced to open an internal dialogue on the performance of health sector staff and service quality and to set clear achievable performance indicators. The programs, including the Rapid Results Initiative and SanteNet's Quality Assurance System, are important as past experiences have shown that attempts to link payment to performance can fail if the mechanisms of direct and indirect accountability are insufficient to measure performance and withhold conditional payments from the nonperforming. For example, in 2004, the MoH started allocating a hardship bonus to health staff working in remote areas. However, the bonuses were not accompanied by either tighter supervision from above or public disclosure and monitoring from the community (the direct link). It is not surprising then that, according to one recent study, the bonus failed to reduce absenteeism among the providers who received it.⁴³

Performance-based Mechanisms: A Hybrid between Financial and Performance Accountability

Performance-based approaches hold potential for increasing performance accountability and have been implemented on a pilot basis in Madagascar, including performance based contracting to civil society and/or private providers and results based financing (RBF) to increase utilization of health services among a specific target group. In general, performance-based mechanisms promote greater accountability of service providers, improve management, efficiency, and equity of service delivery, and facilitate greater involvement of NGOs and the private sector in provision. Although Government is responsible for providing public health services to benefit society as a whole, contracting-out of health services to private providers (e.g., general practitioners) can be more effective and efficient than public provision of services in certain areas. Private services (i) cost less than extending the public health network within reach of every community, and (ii) reduce problems that plague the public system, such as inequity in the distribution of health services of quality and poor performance of health personnel. One such example in Madagascar is the Santé Sud model (Box 3.4 above) which illustrates that harnessing the private sector nonetheless requires a critical mass of customers to ensure financial viability.

RBF for health refers to programs that transfer money or goods to either patients when they take health-related actions (such as Conditional Cash Transfers) or to healthcare providers based on performance. More specifically, the approach introduces incentives to reward results achieved or services utilized, changing both how individuals access or use health services, and how providers deliver them. A RBF pilot to support the delivery of basic mother and children health services in 10 communes of two rural regions of Madagascar was implemented using GAVI funds (Box 6.2) and resulted in an increase in ANC visits, assisted deliveries and complete vaccination.

Besides RBF's potential to improve financial flows, reduce corruption, and increase financial management, it also can strengthen health systems and foster empowerment. Given that accurate monitoring and evaluation of RBF schemes require the development

of robust health information and management systems, incorporating the RBF concept reinforces efforts to improve the timeliness, credibility and accuracy of national reporting, thereby contributing to greater overall capacity of health systems. Another benefit from financing mechanisms linked to results is the fact that it allows for greater innovation and flexibility, providing solutions that are locally applicable, and fosters empowerment on the user-side.

Despite the substantial potential benefits of RBF, successful implementation requires mitigating certain risks associated with the approach. Most notably, implementers have to be careful in choosing performance targets, and ensure that providing incentives for the set targets does not lead to the neglect of other important targets for which no financial incentives are provided. In addition, there is a risk that health workers may focus on easier-to-reach populations in order to meet targets, or that better performing districts will receive more financial support for attaining better results when in fact districts with poorer performance may need more resources. In general, careful monitoring and evaluation is essential to prevent authorities from falsifying data or over-reporting to receive the performance transfers. The latter is a substantial risk in countries where health information systems are relatively underdeveloped or malfunctioning.

Box 6.2. Increasing utilization of basic maternal and child health interventions through RBF

Under the RBF pilot, pilot basic public health centers were provided payments after delivery of specified outputs so that the disbursement of subsidies was linked to the extent of output achieved compared to last year equivalent period. While the RBF was originally designed solely for immunization, the MoH RBF Task Force decided to expand this model to include a package of basic services for mother and child. Thus, subsidies for the health facilities took into account the combination of progress achieved with regard to institutional deliveries, antenatal visit, measles immunization for children between 9 and 11 months, DTCHep3 among children under one. Under the pilot, 60 percent of the subsidies received by the health center were used as incentives for the staff whereas the 40 percent was intended to improve the quality of services delivery.

Contract administration was delegated to an experienced NGO, Catholic Relief Services. Implementation progress was monitored on a monthly basis by the coordination committee for the Pilot (RBF GAVI Comité de Pilotage), which includes the *Equipe de Management de District* (EMAD) and the Regional Health Director.

In fact, the most effective way to prevent misreporting is to ensure that outcome indicators are monitored by an independent agency. This implies that RBF schemes might also require a significant investment in terms of human capital and requires commitment from a wide range of actors. Setting up new agencies, and even adding onto the tasks of existing institutions will require substantial effort, and it is crucial to ensure independence by providing adequate incentives to allow for accurate monitoring. Moreover, legal changes or a framework that includes the opportunity of sanctioning are often prerequisites to enforce accountability for results. In Madagascar, most District health office heads would be sanctioned for the direct misuse of funds if such practices are uncovered through accounting reviews. At the same time though, few sanctions relate to performance or service quality. One study indicates that work-plans and health statistics reports used at the district level reveal a nominal performance orientation, (the

use of strategic objectives and log frames), but there was no focus on health impacts or targets.⁴⁴

Proper evaluation mechanisms need to be put in place to ensure that progress in outcomes observed can actually be attributed to the RBF mechanism. There are a number of types of assessments that can be used to evaluate interventions like results-based financing, such as process monitoring or program assessments, but to allow for actual causal analysis, a rigorous impact evaluation will be necessary. By providing critical feedback with respect to what works and what does not, impact evaluations can help to solidify a results-based project structure, and monitoring of outcome indicators can be folded into standard project design. Given the rigor and time required by impact evaluation instruments, this can substantially add to the cost of implementing RBF as an accountability tool, although at the same time, an increased focus on aid-effectiveness by donors might increase the likelihood of obtaining external financing for results if this is proposed within a comprehensive evaluation framework.

Political and Democratic Accountability in the Health Sector

Political or democratic accountability relates to the participation of communities, citizens or political entities in demanding accountability from the health care system (which can be of a financial or performance nature). One tool that has been used to empower users and create a direct link of accountability between health care users and health care providers is the community scorecard (CSC). Political (sub-national) actors also play a potential role in demanding performance from health service providers. Hence, under democratic accountability comes downward accountability, which has been the focus of a number of recent pilots in the Madagascar health sector. Under such accountability, stakeholders recognize that citizens have the right to know what they can expect from health services (norms, policies) and that providers have an obligation to respond to citizens and to deliver according to these norms. Developing the direct accountability relationship between user and provider can lead to more locally responsive, adaptive, higher quality services as the client becomes an active participant in monitoring the delivery of such services.

Until the recent piloting of CSCs, there seems to have been almost no accountability role for service users in Madagascar. In terms of community involvement in the provision of health care, participants in a district-level study performed in 2005 referred to the role of the community in *helping* the health center, but not necessarily providing critical assessments with regard to the quality of services or monitoring performance according to some common norms (number of personnel, attendance etc.). According to this study, the most commonly cited roles for communities were to provide: (i) community contributions in labor for the construction of health centers; (ii) financing through the mayor for health center staff, housing, and equipment; and (iii) human resources or volunteers to help with vaccination campaigns. Overall, it appeared that in most cases, communities were not perceived as groups or health care consumers with important views concerning quality of services delivery by most of the district health heads included in the study, or by other health center staff interviewed.⁴⁵

To respond to the lack of accountability between the provider and the user, CSCs were introduced in the health sector in Madagascar and two pilot phases were undertaken between 2006 and 2008.⁴⁶ The PSIA in 2007 demonstrated that the lack of an accountability relationship between provider and user was affecting the quality of health

care provided, especially in rural areas. For example, the lack of a pharmacist (due to irregular payment) was a key factor in low attendance. However, ordinary citizens were not aware that the pharmacist was paid by the mayor (and received subsidies for this), and thus there were few repercussions for mayors who diverted these funds to other priorities. Furthermore, because there was no independent verification of performance by communities, doctors and nurses had little added incentive to be responsive to their patients. Thus, starting in late 2006, with the support from a World Bank Technical Assistance Program on Social Accountability and the First Governance and Institutional Development Project, a multi-stage process of CSCs was launched.⁴⁷

In both phases of the CSC pilots, improvements were registered not only in user satisfaction, but also in objective indicators such as clinic deliveries, reception, staffing, and infrastructure. Users in the target communities worked with service providers to improve transparency and accountability, by posting opening hours and drug prices, improving the number of *dispensateurs* and *guardiens* hired, and promoting community-level investment in health services. Some communities organized fundraisers to hire ma-

Box 6.3. Community Score Cards process

Between late 2006 and 2008, CSCs were piloted in two phases in 24 primary health centers in three regions (Haute Matsiatra (central highlands), Boeny and Anosy regions (coastal)). The scorecard process is currently entering its third phase (partial scale-up), after a pause in activity during the recent political crisis.⁴⁸ While Phase 1 of the CSC tested the applicability of the CSC methodology and adapted the tool to the Malgasy context, Phase 2 tested certain methodological and implementation strategies to increase cost efficiency for scaling up, improved results monitoring by incorporating tracking of objective indicators, and increased effectiveness of the tool.⁴⁹ The first phase of the scorecard process was carried out by a team of civil society and consumer organizations, supported by World Bank technical assistance and by the Governance and Institutional Development Project. The second phase was carried out by PACT, an international NGO, which worked with local facilitators and NGOs in Anosy region. All phases include extensive training at the regional level, to build capacity of regional and local CSC facilitators and trainers, and to familiarize MoH staff with the process.

The process of introducing a scorecard consists of the following key steps:

- (i) Preparation during which all community members are publicly informed (via radio or and as many local contacts as possible) about the public meeting during which objective baseline data is collected on each health post;
- (ii) Random selection (allocation of numbers picked from a hat) of participants from the public group for user evaluations (ranking on a scale 1 to 5) of different aspects of service and simultaneous provider evaluations of service quality;
- (iii) Organization of an interface meeting three to five days later between health care provider(s) and the population where both the evaluation results are compared and the norms (and limitations) of service are discussed and shared with community members;
- (iv) Development of a local action plan to address any deficiencies and designation of an existing or new team to follow up on the action plan;
- (v) Publication at the regional level of results from the various scorecard exercises, including press coverage and information feedback to the MoH management and regional authorities;
- (vi) Repetition of the cycle three to four months later to evaluate changes. It is important to ensure that *fokotany* both in the same community as the health center, as well as in more remote communities, are included for evaluation.

sons to improve facilities, other communities organized in-kind payments to generate resources to build facilities together. In each of the communities, volunteer monitoring groups, made up of service providers, users and members of the commune administration, oversaw the implementation of the community action plans through the organization of community consultations on a regular basis. What seems particularly striking is that significant progress has been made in terms of communities implementing their action plans without external support or presence.

Improvements were seen in the first phase in each of the health centers on almost all user-generated satisfaction indicators, by as much as 96 percent. The measurement of overall levels of satisfaction is based on a number of standard government indicators (“common indicators”) as well as indicators that users themselves develop, specific to their facilities. Most assessments included indicators such as availability of drugs, human resources, infrastructure, reception of patients, availability of equipment, cost of drugs and overall satisfaction. Results from the second phase in Anosy region were similar, with notable increases in user satisfaction, particularly with indicators such as client reception. (See Appendix 5 for detailed CSC ratings). Satisfaction rates increased even for some indicators such as the price of medicines—even though the formal prices were not changed. This could point to increased information availability to clients about drug prices, and therefore fewer opportunities for parallel payments.

Providers tended to rate themselves higher on most indicators than users, pointing to the importance of this feedback mechanism in identifying problem areas in how providers treat clients, and the need for a dialogue between providers and users (prior to this, providers would only evaluate themselves as part of the MoH’s quality control process). For example, average satisfaction ratings among users on common indicators by District were 39 percent during the baseline compared to 43 percent by providers. In addition, providers seem to attach more value to indicators that reflect their production function, namely outcome indicators and those that reflect human resources issues. Users consider the most important indicators to be those related to the availability of staff and accessibility of drugs, in terms of both price and availability. Quality of infrastructure was another indicator that users consistently expressed concern about.

Improvements were also noted in certain *outcome indicators* used at the national level, such as vaccination coverage rates; contraceptive rates; institutional delivery rates and outpatient utilization. During the second phase pilots in Anosy region, the degree of improvement in user satisfaction was paralleled by improvements in more objective indicators such as external consultation rates (average increase among all CSB of 10 percent), the proportion of births in the clinic (increase of 24 percent) and contraceptive coverage rates (14 percent increase). Improvements at specific clinics were as high as 57 percent increase in external consultation rates.⁵⁰

With respect to Qualitative Results, facilitators reported that the CSC created unprecedented opportunities for communities and service providers to come together to discuss norms and service delivery in an open forum. Discussion allowed users to better understand the services offered by health centers, ask questions about prices and services, and express any dissatisfaction with service quality. In some cases, users were able to successfully lobby either the MoH or the Commune to increase the number of personnel to reach the norms. The CSC allowed service providers to provide information on their own constraints, dispel certain health myths, underline the importance of utilization of

health center services, and explain certain often misunderstood topics, such as the Equity Fund, and the difference between brand-name and generic drugs. Initial CSC action plans from the 20 target communes included community plans to raise funds or supplies for improving infrastructure, community plans to increase user understanding of certain health issues and treatment, publication of drug pricing lists and opening hours, mobilization of village health management committees and the community management committees, and community campaigns to petition the Ministry for additional personnel in keeping with health center norms.

Phase 2 interventions were evaluated not only in terms of satisfaction and outcomes, but also generated useful insights with respect to the tool's methodology. For instance, results indicated that facilitators with more experience in a given commune performed better compared to others, in terms of facilitation skills, mobilization ability, and effective communication. These facilitators were also more effective due to a deeper understanding of local customs and traditions, a more immediate understanding of the commune's governance and logistical concerns; and they were able to better navigate the physical and political landscape. Further, this phase appeared more sustainable given the fact that all facilitators were from the region and met with target communities each month after the initial CSC, to keep the local follow-up committees on track on implementation of the communities' agreed action plans.

Issues raised through the CSC included: (i) type II health center standards are rarely met (in terms of number of staff, quality of infrastructure, availability of equipment and drug availability); (ii) users lack adequate knowledge about facility standards, such as staff, number of rooms, drug prices, and service availability, implying that users do not assert their rights and can be exploited by providers; (iii) users complain about the availability of certain drugs, while providers are obliged to follow national standards (generic drugs are generally available, but users at times require the availability of other drugs). Hence, some doctors were found to exploit the demand for such other drugs and offer a larger variety of drugs for sale in a private setting; (iv) a clear information gap exists between users and medical staff, and a lack of transparency often leads to relationship problems; (v) beliefs and perceptions of users have an impact on utilization, and their lack of awareness of certain public health issues reinforces erroneous beliefs; and (vi) remoteness, and poor road conditions are clear constraints to utilization at the type II health center level.

The CSCs provided tangible improvements over a short period of time, not only in satisfaction levels, but also in objective indicators, such as attendance rates. These findings are similar to the findings in a randomized research study conducted on a similar exercise in Uganda, which demonstrated that better relations between patients and doctors via the dialogue, combined with publication of results of user evaluations, can lead to greater attendance at health clinics and better health outcomes.⁵¹ While communities have proven to be able to mobilize some resources regarding infrastructure improvements, more often, solutions revolve around writing letters to higher administrative levels outlining key problems. Hence capacity issues relate mostly to running the CSC process, whereas subsequent oversight appears to have been adequately instituted after the scorecard process itself had been implemented. With regard to implementation, the pilots highlighted that regional level technical assistance was needed in the lower capacity communes. This is to be expected however, since the CSC is only a tool, and as

such does not replace the need for adequate support and financing from local governments and higher-level health authorities.

The larger issue to explore, however, is whether the effectiveness of the CSC process remains when applied at a larger scale and over time. In other countries where such tools have been used for over ten years (in Bangalore, India for example), levels of satisfaction have continued to increase over time. Another issue in scaling up relates to the institutional home for third-party monitoring. The advantage of the first phase of CSCs was that they were technically managed outside of the MoH (from a unit linked to the President’s office), which prevented them from being co-opted into more traditional forms of evaluation. Finally, while user satisfaction measures are important, they are not always good proxy measures for quality care, and therefore, it is important that as the process is scaled up, it continues to include intermediate outcome indicators or other quality proxies. The current phase of CSC scale up via Santé Net (an NGO active in supporting the health sector) should provide information on future sustainability of this technique.

Relationships between local political stakeholders and health authorities or communities generally remain weak. Although the above examined the promising results regarding improvements in accountability relationships between providers and users, at present, political accountability relationships are weak in most districts. The latter concerns district health authorities or communities on the one hand, and mayors and local government officials on the other. Since the district health offices are generally perceived as representing the MoH locally, often times district health authorities are pressured to fill empty slots in health centers or construct new facilities even through these are not decisions generally made at the district level. These developments further illustrate the ambiguities that exist in the current regulations regarding the employment and deployment of the health workers in the regions.⁵²

Notes

1. Lewis, M. (2006). “Governance and Corruption in Public Health Care Systems.” Center for Global Development (CGD) Working Paper #78. Washington D.C.
2. Brinkerhoff, D.W. (2004). Accountability and health systems: toward conceptual clarity and policy relevance. *Health Policy and Planning* 19(6): 371-379.
3. Lewis, 2009.
4. The framework was first applied in Brinkerhoff and Keener 2003; and used again in Brinkerhoff 2005. Brinkerhoff, D.W and S.C. Keener, (2003). District-level service delivery in Rural Madagascar. Research Triangle Institute; (2005) Pro-poor Health Services in Madagascar: Decentralization and Accountability. Paper presented at the Global Health Council in Washington DC, May 31-June 3, 2005.
5. This discussion of the purpose of accountability is adapted from Brinkerhoff, 2004, and based on the purposes as described by Aucoin P. and R. Heintzman (2000) The dialectics of accountability for performance in public management reform. *International Review of Administrative Sciences* 66(1): 45-55.
6. For example, results-based financing (RBF) mechanisms fall into financial accountability, but also have a performance dimension given that allocations are based on commitment to achieve a pre-determined set of performance targets or outcome indicators.
7. Kaufman, D, A. Kraay and M. Maztruzzi. (2005). “Governance Matters III: Indicators for 1996-2002.”
8. Within these clusters, different criteria are assessed, and weighted cluster averages are then used to calculate a mean score of the four clusters, where the scale ranges from 1 (lowest) to 6 (highest).

The WB uses these ratings to construct its Resource Allocation Index (IRAI), which is subsequently used in the allocation of IDA resources.

9. World Bank, (2008). Project Appraisal Document for the Second Governance and Institutional Development Project. Report No: 41885-MG; Transparency International CPI Scores, 2008.

10. In December 2008, the MoH jointly with the donors nominated a “focal point” for each partner to facilitate the flow of information, and in particular, the timely regularization of expenditures. See also Chapter 3.

11. World Bank, (2009). “Service Delivery in the Education and Health Sector in Madagascar.”

12. World Bank, (2005) “Madagascar Public Expenditure Review: The Challenge of Poverty Reduction.”

13. In addition, as discussed in the financing chapter, the transfer itself is often delayed or not made at all, with many health centers short of funds to finance their operational or investment budget.

14. MSPF, *Appui Technique pour l'amélioration du processus budgétaire du MSPF—Revue comparative, recommandations et Plan d'action*, August 2008.

15. Brinkerhoff and Keener, 2003.

16. Informal payments can be defined as “payments to individual and institutional providers, in kind or in cash, that are made outside official payment channels or are purchases meant to be covered by the health care system. This encompasses ‘envelope’ payments to physicians and ‘contributions’ to hospitals as well as the value of medical supplies purchased by patients and drugs obtained from private pharmacies but intended to be part of government-financed health care services” (Lewis, 2000; 2002).

17. As Lewis notes: “where all fees have been banned, any payment by households is clearly unofficial, but in many countries formal fees exist, blurring the dichotomy” (Lewis, 2006).

18. Brinkerhoff and Keener, 2003.

19. Evidence from Africa suggests that informal payments of various kinds are common in Uganda (McPake et al., 1999), Mozambique (Lindelow, Ward and Zorzi, 2004) and Ethiopia (Lindelow, Sereneels and Lemma, 2003). In all three, patients pay public providers directly for consultations and drugs over and above any formal charges.

20. Brinkerhoff and Keener, 2003.

21. Keener et al, World Bank, “Madagascar Poverty and Social Impact Analysis: Health Care and the Poor,” 2007.

22. Banque Mondiale, “Mesure de la Performance de la Gestion des Finances Publiques en République de Madagascar—selon la méthodologie PEFA,” Version provisoire, Mars 2008.

23. Ibid, 2003.

24. Leakage in the delivery of pharmaceutical drugs is defined here as discrepancies in the quantity or in the value/price of drugs reported as sent by the district Pharmacies and as received by the health center pharmacies. Leakage occurs when the district Pharmacies reported to have sent more goods or goods of a higher value than claimed as received at health center pharmacy level or when the latter claimed to have paid a higher price than reported to have been received at district level (see also World Bank, 2009.)

25. World Bank (2008). “Madagascar: Poverty and Social Impact Analysis of Health Care and the Poor.”

26. Basic health centers can be classified into two types: CSB I and CSB II, and CSB II are managed by a doctor and a paramedical staff while CSB I are managed by paramedical staff and aides. See for more information on health sector organization Chapter II.

27. Value/price leakage is defined as when the district pharmacy stated to have sent goods of a higher value than reported as received by the health center pharmacy, or when the latter claimed to have paid a higher price than was reported to have been received at the district level. Quantity leakage occurs when the district pharmacy reported to have sent more drugs than stated as received at health center pharmacy level (World Bank, 2009).

28. World Bank, Draft 2009.

29. See Putnam, R.D. (1993). *Making Democracy Work*. Princeton: Princeton University Press.

30. See Rubio, M., (1997), "Perverse Social Capital—Some Evidence from Colombia," *Journal of Economic Issues*, 31(3): 805-816; and Warren, M., (2004), "Social Capital and Corruption," in: Castiglione, D. (Ed.), *Social Capital: Interdisciplinary Perspectives*, Oxford University Press, pp. 16-18.
31. It should be noted that further results did not change when the variable was excluded.
32. World Bank, (2007a), "Madagascar Public Expenditure Review 2006/2007."
33. Excluding literacy does not change the significance of the mean expenditures result, although the magnitude of the effect is reduced. Similarly, excluding mean expenditures reduces the magnitude and significance of the literacy result (World Bank, 2009).
34. World Bank, 2009.
35. Ibid, 2009.
36. One should keep in mind that supervision visits are required to take place on a quarterly basis, whereas the survey assessed this issue over a 6-month period.
37. This also has tremendous consequences for the flexibility of the budget since personnel make up more than 25 percent of the total budget and more than 75 percent of the recurrent budget.
38. Lewis, 2006.
39. See also McPake, et. al. (1999). 'Informal Economic Activities of Public Health Workers in Uganda: Implications for Quality and Accessibility of Care'. *Social Science and Medicine*. 49: 849-865; Lewis, M., G. Eskeland, and X. Traa-Valarezo. (2004). 'Effectiveness and Impact of Rural Health Care Policies in El Salvador'. *Health Policy*. 70(3): 303-325; and Di Tella, R. and Savedoff, W. D. (eds.). (2001). *Diagnosis Corruption*. Washington, DC: IADB.
40. Two definitions of absenteeism were used. The first basic definition considers health workers as absent if they were not in the health facility at the time of the random visit. The extended definition considers employees as absent according to the basic definition, but added four elements: (1) employees who were not initially mentioned by the director, but who showed up during the second part of the visit were considered as absent; (2) staff of facilities that were closed due to staff absenteeism; (3) employees who were mentioned in the first round, but not in the second round were included as absent in the second round and vice versa (excluding those employees who were recently hired); and (4) employees who were reported by the director to be present, but whose physical presence could not be verified by the enumerators. The survey was a two-round survey, consistent with the international protocol on absenteeism, and conducted one visit in November 2006, and a second visit in 2007. A total of 411 health workers was surveyed (World Bank, 2009).
41. Ibid.
42. Due to the design of the survey, only the reasons for health worker absence that were included in the basic definition were used. Moreover, declared reasons for absence should be viewed with some skepticism as the respondent may be trying to shed a favorable light on fellow employees.
43. World Bank (2008), "Social Accountability in the Health Sector in Madagascar."
44. Brinkerhoff and Keener (2003).
45. Ibid.
46. This section draws heavily on the findings from a series of draft documents on the WB supported CSC pilots in Madagascar, (Keener, Keller and most notably: World Bank (2008) "Scale-up of the Community Scorecard Process in the Madagascar Health Sector." Discussion Draft, November 20, 2008; and the report by MSIS and Pact Madagascar summarizing the results of the Phase II pilots in the Anosy Region: "Coordination et Gestion de mise en oeuvre du CSC au niveau de 20 CSB de la Region de l'Anosy." October 2008.
47. The approach involved four consecutive stages of the pilot, each with specific objectives and the last stage consisting of national scale-up.
48. A USAID supported NGO, SanteNet, which has provided technical support to much of the health care centers, will integrate a scorecard approach into its work with communities at the commune level (Commune Mendrika program) in a large number of health posts.
49. The second phase explored the effectiveness of community based vs. regionally based facilitators by dividing facilitators into two types: 10 Regional facilitators (RFs), possessing strong numeric, analytical, and organizational capacity, and 40 Communal facilitators with strong facilitation skills. Each were assessed for effectiveness. While community level facilitators were more effective in organizing follow up, they were less skilled at the quantitative reporting required to

compare results. As a result, the model proposed for scaling up will continue to include regional level facilitators.

50. One clinic had a history of conflict between the medical doctor and the population, and was starting from a lower base than the others, thus pulling down the overall averages.

51. This study [Björkman, Reinikka and Svensson, Seminar Paper No. 749, *Local Accountability*] showed a 33 percent reduction in infant mortality in one year compared to control clinics and a 63 percent increase in consultations for family planning.

52. Brinkerhoff, 2005.

Appendixes

Appendix 1. Indicators and Outcomes

Table A1.1. Population dynamics

	Madagascar				Low income		Sub-Saharan Africa	
	1980	1990	2000	2006	1990	2006	1990	2006
Population, total (millions)	9.1	12	16.2	19.2	1747.9	2419.7	516.7	781.8
Population, male (% of total)	50	50	50	50	51	51	50	50
Population, female (% of total)	50	50	50	50	49	49	50	50
Population ages 0-14 (% of total)	45	45	45	44	41	36	46	43
Population ages 15-64 (% of total)	52	52	52	53	56	59	51	54
Population ages 65 and above (% of total)	3	3	3	3	4	4	3	3
Population growth (annual %)	2.8	2.9	2.9	2.7	2.4	1.8	2.9	2.5
Birth rate, crude (per 1,000 people)	45	44	40	37	36	29	45	39
Death rate, crude (per 1,000 people)	17	15	12	10	12	10	16	15
Age dependency ratio (dependents to working-age population)	0.9	0.9	0.9	0.9	0.8	0.7	0.9	0.9
Fertility rate, total (births per woman)	6.5	6.2	5.5	4.9	4.7	3.5	6.2	5.2
Adolescent fertility rate (births per 1,000 women ages 15-19)	..	..	152	136	..	82	..	122
Life expectancy at birth, total (years)	48	51	56	59	57	60	50	50
Life expectancy at birth, male (years)	47	50	55	57	56	59	49	49
Life expectancy at birth, female (years)	49	52	58	61	57	62	52	52
Mortality rate, infant (per 1,000 live births)	106	103	84	72	93	74	109	94
Mortality rate, under-5 (per 1,000)	175	168	137	115	143	112	184	157
Mortality rate, child (male per 1,000)	..	85	..	45	..	..	..	..
Mortality rate, child (female per 1,000)	..	82	..	45	..	..	..	..
Mortality rate, adult, male (per 1,000 male adults)	353	434	305	289	281	285	..	421
Mortality rate, adult, female (per 1,000 female adults)	278	377	255	231	265	223	..	391
Survival to age 65, male, (% of cohort)	..	..	51	54	..	56	..	40
Survival to age 65, female, (% of cohort)	..	..	57	61	..	63	..	45

Table A1.2. Population projections (000s)

AGE GROUP	2005	2010	2015	2020	2025
TOTAL M+F	18,643	21,286	24,086	26,978	29,920
MALES					
0-4	1,554	1,676	1,779	1,860	1,920
5-9	1,365	1,494	1,622	1,731	1,817
10-14	1,172	1,346	1,476	1,605	1,715
15-19	988	1,157	1,331	1,461	1,590
20-24	826	970	1,138	1,310	1,440
25-29	698	807	948	1,113	1,284
30-34	578	680	786	923	1,086
35-39	483	561	660	762	896
40-44	401	467	543	637	736
45-49	330	385	449	521	612
50-54	267	313	366	427	496
55-59	188	249	293	343	400
60-64	151	171	227	268	315
65-69	114	130	148	198	234
70-74	78	90	104	119	160
75+	76	88	104	121	142
TOTAL	9,270	10,585	11,973	13,398	14,842
FEMALES					
0-4	1,541	1,653	1,754	1,834	1,893
5-9	1,364	1,486	1,604	1,712	1,798
10-14	1,172	1,346	1,469	1,590	1,699
15-19	988	1,159	1,333	1,458	1,579
20-24	827	974	1,145	1,319	1,444
25-29	703	813	959	1,128	1,301
30-34	586	689	797	941	1,109
35-39	490	573	674	781	923
40-44	407	477	559	659	764
45-49	336	394	464	544	642
50-54	273	323	381	448	527
55-59	201	259	308	364	430
60-64	167	186	242	288	342
65-69	130	148	166	217	261
70-74	92	107	123	139	183
75+	97	114	134	158	185
TOTAL	9,373	10,701	12,113	13,580	15,078
Dependency ratio (%)	88.5	83.4	77.1	71.9	67.0
	2005-10	2010-15	2015-20	2020-25	
Birth rate (per 1,000 people)	36.4	33.6	30.9	28.4	
Death rate (per 1,000 people)	9.8	8.8	8.2	7.7	
Rate of natural increase (per 100 people)	2.7	2.5	2.3	2.1	
Net migration rate (per 1,000 people)	-0.1	0.0	0.0	0.0	
Population growth rate (average annual %)	2.7	2.5	2.3	2.1	
Total fertility rate (births per woman)	4.8	4.3	3.8	3.4	
Net reproduction rate (female births per woman)	2.0	1.8	1.6	1.5	
Life expectancy at birth (years)	59.4	61.1	62.5	63.9	
Life expectancy at age 15 (years)	53.0	53.6	54.1	54.7	
Infant mortality rate (per 1,000 live births)	65.5	57.6	51.2	45.5	
Under-5 mortality rate (per 1,000)	106.2	91.6	79.6	69.2	

Appendix 2. Child Nutrition and Early Childhood Development

Available Nutrition Surveys

The chapter draws from three household surveys spanning, longitudinal at the community level over a ten year period (1997-2007), and from a rich set of census-based variables that help us characterize the differential socio-economic environments. The first nationally representative household survey was fielded in the months of April and July of 1997 and 1998 by the National Institute of Statistics (INSTAT). The survey is nationally representative, and covers all but three districts in the country. The districts comprising the capital (Antananarivo) and two other districts (Kandreho, and Benenitra) not surveyed at baseline were subsequently added to the follow-up survey, to achieve national coverage. The objective of the baseline survey was to obtain a sufficiently precise estimate of the incidence of malnutrition at the district level, so as to target the community based intervention in the districts with an incidence of moderate underweight above the national average.

A first follow-up, nationally representative anthropometric survey was administered in 2004 in the same season as in the 1997/98 sample. In order to be able to control for both observed and unobserved community level characteristics in the evaluation, the survey was planned to be administered to the *same* communities (Fokontany) interviewed during the baseline survey, thereby creating a longitudinal panel at the community level. About one third of the communities at baseline were subsequently selected for the program. The core questionnaire was expanded to include a female module with in-depth questions on knowledge, self efficacy and practices. The questions cover pregnancy and child care adapted from the DHS in order to capture intermediate indicators that are likely to be affected by the program.

A second follow-up survey was fielded between May and July of 2007. The objective of this follow-up sample was to project the estimates of the impact of the program over a medium-long horizon. To minimize the cost of data collection, a subset of communities (about 1/3) communities were sampled from the two previous rounds. A random sample of participating and non-participants communities (75 each) was drawn from the 1997/98 and 2004 sample frame. The 2007 follow-up survey adopted the 2004 questionnaire and expanded the scope of the survey beyond nutritional outcomes, with the inclusion of a battery of tests to measure child development along multiple domains: namely, cognitive development (visual spatial processing, fluid reasoning, sustained attention, short term memory, executive function), language, gross and fine motor skills and socio-emotional development.

The anthropometrics surveys are complemented with two data points of the Commune Census data, conducted in 2001 and in 2007 under a joint collaboration between Cornell University, INSTAT and the agricultural research institute within the Ministry of Scientific Research (FOFIFA). The census contains detailed information on demographic and socio-economic characteristics of all communes in the country, such as remoteness, main economic activities, local infrastructure, and a detailed history of weather shocks. The two rounds of census data provide a rich set of variables that allow us to document the underlying changes in socio-economic conditions, environment, and infrastructure of the program and non-program areas at very high level of geographic disaggregation.

Table A2.1. Socio-economic correlates of nutritional outcomes

	Weight for age z-score		Moderate Underweight		Height for age z-score		Moderate Stunting	
	coeff	s.e.	coeff	s.e.				
Individual Characteristics:								
Age < 12 months	0.404***	0.060	-0.068***	0.023	0.593***	0.062	-0.164***	0.025
Age 12-24 months	-0.134***	0.041	0.101***	0.020	0.010	0.051	0.043*	0.023
Age 24 - 36 months	-0.053	0.040	0.069***	0.019	0.122***	0.046	0.010	0.022
Age 36-48 months	0.019	0.039	0.026	0.020	0.091*	0.047	0.023	0.023
Age 48-60 (excluded category)								
Birth order: 1st	0.150***	0.052	-0.044*	0.024	0.117*	0.065	-0.018	0.026
Birth order: 2 nd	0.191***	0.049	-0.063***	0.022	0.123**	0.057	-0.014	0.022
Birth order: 3 rd	0.116**	0.045	-0.034	0.021	0.108*	0.057	-0.013	0.023
Birth order: 4 th or higher (excluded category)								
Male	-0.075***	0.026	0.019	0.012	-0.140***	0.033	0.058***	0.014
Maternal characteristics:								
Mother's age	0.002	0.003	-0.000	0.001	0.004	0.004	0.001	0.001
Married	0.058	0.087	0.001	0.040	0.139	0.125	-0.023	0.044
Mother catholic	-0.042	0.033	0.019	0.015	-0.029	0.036	0.026	0.016
Mother's log height	4.881***	0.399	-1.768***	0.179	5.354***	0.533	-2.052***	0.199
No education (excluded category)								
primary education	0.090**	0.041	-0.022	0.019	-0.026	0.044	0.013	0.019
Secondary and above	0.101**	0.049	-0.034	0.023	-0.038	0.056	-0.010	0.023
Mother with salary job	0.029	0.089	0.001	0.036	-0.128	0.114	0.028	0.045
Family worker	0.076	0.056	-0.019	0.025	-0.109*	0.064	0.011	0.024
Independent worker	0.007	0.062	-0.003	0.028	-0.184**	0.073	0.038	0.029
Household head	0.121	0.090	-0.050	0.039	0.028	0.102	-0.001	0.043
Spouse of the head	0.070	0.090	-0.039	0.042	-0.099	0.130	-0.018	0.045
Household characteristics:								
Household size	-0.003	0.008	0.003	0.004	0.002	0.010	0.003	0.004
1 st asset quartile (excluded category)								
2nd asset quartile	0.039	0.046	-0.023	0.020	-0.005	0.054	-0.034	0.023
3rd asset quartile	0.099**	0.047	-0.052**	0.022	-0.011	0.061	-0.025	0.025
4th asset quartile	0.262***	0.055	-0.134***	0.026	0.070	0.073	-0.084***	0.031
No. bedrooms dwelling	0.052***	0.020	-0.010	0.009	0.029	0.024	-0.011	0.010
Access to safe water safe water access	0.013	0.034	0.001	0.015	0.022	0.040	-0.030*	0.016
Village/Commune-level characteristics:								
Fkt avg underweight 1997 underweight in 1997	-0.319**	0.134	0.129**	0.059	-0.022	0.183	0.067	0.058
Travel time to urban center	0.004***	0.001	-0.001***	0.000	0.006***	0.001	-0.002***	0.000
Commune next to a provincial road	-0.022	0.037	0.015	0.017	0.039	0.046	-0.037**	0.017
Fkt next to a road	0.005	0.040	-0.005	0.017	-0.010	0.046	-0.013	0.018
Rural area	-0.009	0.061	-0.004	0.026	-0.040	0.078	0.007	0.030
Access to electricity Fkt	0.142**	0.063	-0.042*	0.025	0.075	0.072	-0.015	0.027
Poverty	0.015	0.141	-0.016	0.056	-0.047	0.152	0.002	0.059
Access to a bus stop	0.089**	0.041	-0.013	0.019	0.029	0.048	-0.017	0.019
Daily market	-0.069	0.043	0.016	0.019	-0.036	0.049	0.037**	0.018
Access to paved road	0.066*	0.037	-0.013	0.017	0.025	0.045	-0.014	0.017
Presence of hospital	-0.054	0.053	0.009	0.024	-0.031	0.062	0.004	0.024
cyclone hit last 5 years	-0.111***	0.035	0.044***	0.016	-0.074*	0.044	0.038**	0.017
Population(log) Fokontany	-0.007	0.031	0.005	0.014	0.042	0.041	-0.005	0.016
Fianarantsoa	-0.016	0.056	-0.002	0.026	0.063	0.064	-0.023	0.027
Toamasina	-0.023	0.067	0.021	0.029	0.119	0.077	-0.052	0.032
Mahajanga	-0.005	0.068	0.004	0.030	0.273***	0.083	-0.124***	0.033
Toliara	0.004	0.067	-0.007	0.031	0.170*	0.089	-0.075**	0.034
Diego	0.217***	0.078	-0.078**	0.031	0.345***	0.095	-0.137***	0.039
Antananarivo (excluded category)								
No. observations	5,454	5,434	4,434	4,431				
R ²	0.101	0.065	0.104	0.082				

Note: Estimates based on the 2004 anthropometrics survey. Standard errors are clustered at the village level. Fkt refers to Fokontany level variables. Stars represent significance at 10, 5 and 1% level respectively.

Table A2.2. District level changes on nutritional outcomes (1997-2004): fixed effect regressions

	Weight for age z-score District average			Underweight (-2SD) District average			Height for age z-score District average			Moderate Stunting (-2SD) District average		
Cyclone incidence	0.026 (0.081)	0.051 (0.083)	-0.005 (0.094)	-0.029 (0.029)	-0.041 (0.030)	-0.015 (0.033)	-0.261*** -0.091	-0.173** -0.086	-0.188* -0.098	0.068*** (0.025)	0.046* (0.025)	0.054* (0.028)
Flood incidence	-0.138 (0.108)	-0.143 (0.108)	-0.074 (0.123)	0.064 (0.039)	0.066* (0.039)	0.030 (0.043)	0.117 -0.122	0.099 -0.112	0.114 -0.129	-0.030 (0.034)	-0.025 (0.032)	-0.045 (0.036)
Drought incidence	-0.032 (0.089)	-0.019 (0.090)	-0.012 (0.093)	0.028 (0.032)	0.025 (0.032)	0.016 (0.032)	-0.107 -0.1	-0.09 -0.093	-0.13 -0.097	0.046 (0.028)	0.043 (0.027)	0.054** (0.027)
Cash crops important		0.120 (0.100)	0.035 (0.119)		-0.035 (0.036)	-0.002 (0.042)		0.233** -0.104	0.196 -0.124		-0.048 (0.030)	-0.048 (0.035)
Pulses, legumes and nuts important		0.149 (0.123)	0.166 (0.129)		-0.076* (0.044)	-0.083* (0.045)		0.528*** -0.128	0.534*** -0.135		-0.127*** (0.037)	-0.110*** (0.038)
Immunization hall available			-0.116 (0.107)			0.019 (0.037)			0.002 -0.111			-0.023 (0.031)
Hospital available			-0.133 (0.238)			0.060 (0.083)			0.271 -0.249			-0.039 (0.070)
Access to running water			0.302** (0.149)			-0.079 (0.052)			0.082 -0.156			-0.042 (0.044)
Access to electricity			0.076 (0.149)			-0.074 (0.052)			-0.1 -0.155			0.027 (0.044)
Access to a protected well			0.135 (0.123)			-0.080* (0.043)			0.237* -0.129			-0.053 (0.036)
Presence secondary school			0.101 (0.211)			-0.061 (0.074)			-0.459** -0.221			0.127** (0.062)
(log) time to nearest urban area		-0.078 (0.062)			0.045** (0.022)			-0.071 -0.064			0.023 (0.018)	-0.078 (0.062)
F-tests joint significance:												
Shocks (p-value)	0.044	0.046	0.182	0.132	0.315	0.829	0.035	0.038	0.222	0.122	0.210	0.550
Crops (p-value)	.	0.824	0.921	.	0.015	0.021	.	0.600	0.685	.	0.042	0.076
Infrastructure (p-value)	.	.	0.698	.	.	0.551	.	.	0.642	.	.	0.795

Note: Unit of analysis is the district. Population weighted average nutritional outcomes are obtained from the anthropometric surveys 1997-98 and 2004. The population weighted average of infrastructure characteristics at the district level are constructed from the commune censuses 2001 and 2007. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix 3. Health Financing

Table A3.1. Comparison in health expenditure indicators between Madagascar and other Sub-Saharan countries

Countries	Health expenditure as percentage of GDP (2002)	Health expenditure per capita (\$US)
Madagascar (2003)	3.5	11.9
Ethiopia	5.7	4.3
Kenya	4.9	19.2
Mozambique	5.8	8.9
Rwanda	4.1	12.7
Sub-Saharan African countries median	6.0	12.9

Source: MoH. 2005. "Madagascar National Health Accounts 2003."

Table A3.2. Comparison of the budget allocation by ministries 2008-2009

	In % of total excluding interest payments		
	2008	2009	% change
Presidency	2.6	3.7	66.4
Senate	0.2	0.4	104.9
National Assembly	0.4	0.7	93.7
High Constitutional Court	0.1	0.1	60.9
Prime	1.4	1.5	20.4
Ministry of Foreign Affairs	1.7	2.6	73.2
Ministry of National Defence	5.7	3.8	-21.3
Ministry of Interior and Decentralization	5.5	5.7	20
Secretary of State for Public Security	1.9	4.4	173.1
Ministry of Justice	2	2	15.7
Ministry of Finance and Budget	18.9	16.8	3.9
Ministry of Economy Trade and Industry	1	1.3	52.7
Ministry of Public Functions and Social Law	0.3	0.2	9.1
Ministry of Agriculture, Livestock and Fisheries	8.3	8.3	17.2
Ministry of Environment, Forests and Tourism	2.3	2.3	18
Ministry of Energy and Mining	6.2	1.6	-70.7
Ministry of Water and Sanitation	0	2.2	...
Ministry of Public Works and Meteorology	11.4	10.2	4.4
Ministry of Land Reforms, Estate and Country Planning	4.6	5.8	45.5
Ministry of Transport	2.5	4.3	103.3
Ministry of Telecommunication, Post and Communication	1.1	0.5	-44.6
Ministry of Health	8.2	9.1	28.7
Ministry of Sports, Culture and Environment	0.5	0.5	24
Ministry of National Education	18.4	17.7	12.9
Total budget including interest payments			17.3
Total budget excluding interest payments			15

Source: World Bank, Madagascar Understanding the 2009 Budget Law," 2008.

Table A3.3. Budget execution rate of selected sector ministries 2008 (End of June 2009)

	Execution rate (in %)
Ministry of Finance and Budget	84.4
Ministry of National Education	77.4
Ministry of Public Works and Meteorology	31.3
Ministry of Health	68.5
Total National Budget	63.7

Table A3.4. MoH's budget by economic category 2005-2008 (in billions Ariary)

	2005	2006	2007	2008	Avg. growth
TOTAL	144.7	167.8	198.7	256.0	9.9
Recurrent Expenditures	73.7	75.9	96.2	117.4	6.5
Salaries	38.8	44.3	49.0	67.7	9.9
Non-salary	34.9	31.6	47.2	49.7	4.6
Investment	71.1	91.9	102.5	138.7	13.8

Source: MFB.

Table A3.5. Summary of ongoing health projects funded by the development partners in 2008

Health Program	Development Agencies
Direct budget support to the Ministry of Health (central administration)	AfD, BM, EU
Institutional and technical support to the MoH	WHO, UNICEF, AfD, BAD
Fight against transmissible diseases, in particular HIV/AIDS and other sexually transmissible diseases	Cooperation Française, BAD, UNAIDS, GFATM, GTZ, Principality of Monaco, UNDP, UNICEF, USAID, WHO
TB and respiratory infections	GFATM, BAD
Malaria	WHO, UNICEF, GFATM, USAID, BM, RBM
Management of childhood illnesses/child survival	UNICEF
Extended program of immunization and supporting the epidemiological surveillance system	GAVI, UNICEF, JICA, AFD
Strengthening maternal and neonatal health care and services	JICA, UNICEF, BM
Reinforcement of basic health centers	BAD, BM, FID, UNICEF, Principality of Monaco
Reinforcement of hospitals (construction, equipment and medical materials)	USAID, Royaume du Maroc, Principality of Monaco,
Fighting malnutrition	UNICEF, WFP, BM
Family planning and reproductive health	USAID, UNFPA, BM, BAD
Water and sanitation	UNDP, UNICEF, BAD, UNFPA, USAID

Table A3.6. Distribution of the MoH budget by administrative level 2007 and 2008

	2007				2008				Real Growth (2) 07/08
	Salary (1)	Non-salary (2)	Invest. (3)	Total	Salary (1)	Non-salary (2)	Invest. (3)	Total	
	In %			(million Ariary)	In %			(million Ariary)	In %
Central	30	66	97	154,083	30	62	97	180,756	-8.4
Regional	70	34	3	56,158	70	38	3	58,331	9.6
Province	70	0	0	35,720	0	0	0	35,720	
DRSPFPS	0	4	0	1,797	0	5	0	2,511	30.2
CHRR	0	6	0	2,832	0	7	0	3,234	6.3
SDSPS	0	8	3	7,469	0	7	2	3,663	-7.0
CHD 2	0	3	0	1,440	0	3	0	1,559	0.8
CHD1/CSB	0	8	0	3,686	0	10	0	4,750	20.0
Other	0	7	0	3,214	0	6	0	6,894	-8.6
Total	100	100	100	210,241	100	100	100	239,087	-2.3
Central				73.3				75.6	
Regional				26.7				24.4	

Source: HERA, Support mission regarding the definition of the component "deconcentration and development of basic service health centers." July 2008.

1. Including SMS, SPGFE, SSM, IFIRP.

Table A3.7. Comparison between actual health budget and projections of the MTEF

	Actual Spending			Budget	MTEF Projections			
	2005	2006	2007 ¹	2009 ²	2009	2010	2011	2012
Scenario 1								
Health budget (in billions of Ariary)	69.1	120.3	145.9	329	374	428	436	464
Scenario 2								
Health budget (in billions of Ariary)	69.1	120.3	145.9	329	435	530	532	592

Source: MoH (2008) *Cadre de Dépense à Moyen Terme du Secteur Santé de Madagascar 2009-2011*.

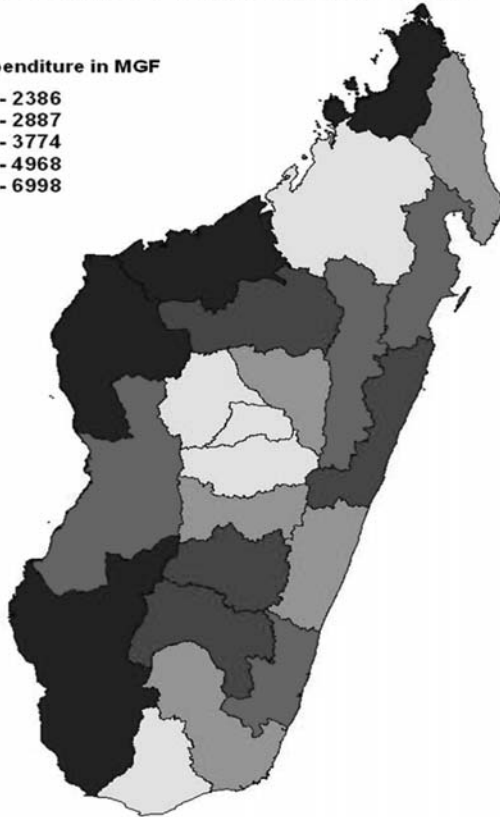
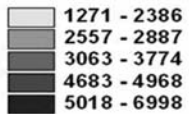
1. Based on preliminary estimates (MFB)

2. Loi de finances 2009

Figures A3.1a and A3.1b.: Regional distribution of non-salary recurrent expenditures per capita and distribution of health personnel under the ministry payroll

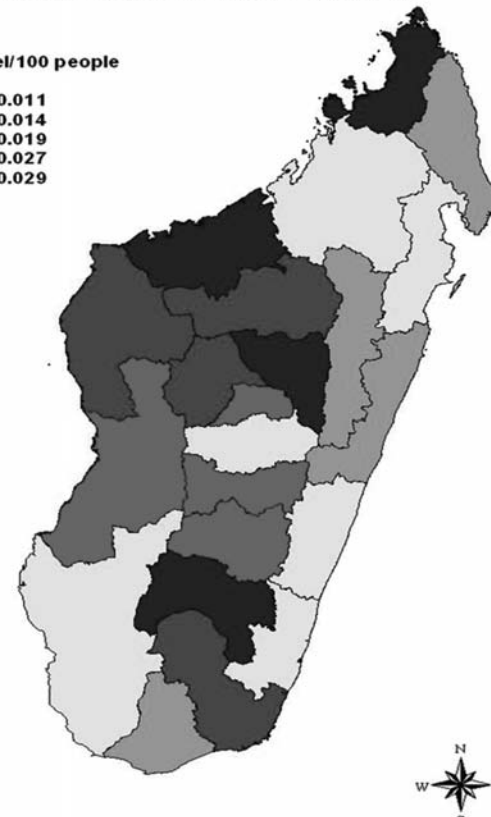
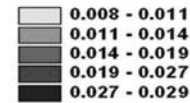
Regional /Per Capita/Recurrent /HealthExpenditure/CF 2005

Per Cap Expenditure in MGF



Civil Servant/ 100 People at MINSANPF by Region

Health Personnel/100 people



Source: Madagascar PER, 2007, Health Chapter.

Appendix 4. Best Practices in RBF from around the World

In Haiti, a government scheme supported by USAID paid NGO health providers based on the achievement of certain targets, such as proportion of children fully immunized and pregnant women receiving prenatal care. In the seven years that the program has been operating, huge improvements in key health indicators have been achieved (including a remarkable 13 percentage point increase in full immunization coverage). NGOs now reach about one-third of the population, providing essential services in the complicated context of violence, poverty, and limited government leadership.¹

In Rwanda, the national government selected features from three donor-supported RBF pilots to construct a national, unified approach for paying public and NGO service providers based on services provided. The subsequent national roll-out of RBF in Rwanda has been impressive, and was a process of implementing what was known to work from the pilots, examine results, and adapt the system accordingly. Important steps in the roll-out included the introduction of a national RBF database that assists district steering committees and the national level in managing the model.² Between 2001 and 2004, RBF provinces saw an increase in curative care visits per person from 22 to 55 percent and institutional deliveries nearly doubled (from 12 to 23 percent).

In Argentina, output-based aid in maternal and child health insurance programs was introduced in 2004 to fight infant mortality in the country's poorest provinces. Provincial governments administer the program and receive funding on the basis of the numbers of mothers and children enrolled and performance on indicators measuring service delivery and quality. The services are provided by existing health facilities, which receive a standard payment per patient and per service provided. Achievements so far show the advantages of combining results-based contracting with funding, and in first four months of the program, already 400,000 people were enrolled, approximately 45 percent of the eligible population and more than the target number.³

Results-based financing has also been shown to help to increase patient demand for health services. Evaluations of large-scale conditional cash transfer programs in Latin America and the Caribbean show increases in the use of clinic services for children (Honduras, Nicaragua, Colombia) and prenatal care (Mexico, Honduras) and decreases in childhood stunting (Mexico, Nicaragua, and Colombia).⁴

Notes

1. Center for Global Development (CGD), (2007) "Performance-Based Incentives for Health: Six Years of Results from Supply-Side Programs in Haiti," CGD Working Paper #121.
2. Rusa, L., and Frische, G. (2006), "Rwanda: Performance-Based Financing in Health." www.rbf-health.org.
3. Johannes, L. (2007). "Output-based aid in health: the Argentine Maternal-Child Health Insurance Program." Global Partnership on Output Based Aid: www.gpoba.org.
4. L. Morgan, (2009) "Results-Based Financing for Health: Performance Incentives for Global Health: Potential and Pitfalls," World Bank, Washington, DC.

Appendix 5. Summary of CSC Ratings in Anosy during implementation and follow-up

User Ratings regarding Structural Quality	Implementation	Monitoring	Average change
Infrastructure quality	33.03	41.34	8.31
Availability of personnel	34.9	39.6	4.71
Drug availability	39.17	52.55	13.38
Quality of medical supplies	33.43	48.72	15.29
Quality of patient reception	53.9	70.41	16.51
Average of indicators	39	50.53	11.53
Provider Ratings regarding Structural Quality			
Infrastructure quality	35.97	43.45	7.48
Availability of personnel	34.83	43.47	8.63
Drug availability	56.19	69.06	12.87
Quality of medical supplies	36.7	54.62	17.91
Quality of patient reception	66.76	80.12	13.36
Average of indicators	46.09	58.14	12.05
User Ratings regarding 'Relationship' with CSB			
Relationship between user & providers	44.63	63.75	19.11
Accessibility CSB	33.4	31.9	-1.5
Price and availability of drugs	40.83	55.99	15.16
Average	39.62	50.55	10.93
Provider Ratings regarding 'Relationship' with CSB			
Relationship between user & providers	47.96	45.33	-2.63
Accessibility CSB	38.75	36.5	-2.25
Price and availability of drugs	74.86	80.00	5.14
Average	53.86	53.94	0.09
National indicators reported by providers			
Vaccination rates	75.77	86.19	10.42
Contraceptive Prevalence Rate	67.59	81.21	13.62
Prenatal consultation (at least 1)	81.23	83.44	2.21
Assisted delivery (at the health center)	37.78	62.16	24.38
Outpatient consultation rate	63.37	73.29	9.82
Average	65.15	77.24	12.09

Source: MSIS & Pact Madagascar (2008). "Coordination et Gestion de mise en œuvre du Community Score Card au Niveau de 20 CSB de la Région de l'Anosy."

References

- Adeya, G., Harvey, P., Nturu, M., Swedberg, E., & Wansi, E. (2006). *Assessment for the Introduction of Zinc and the Revitalization of Diarrhea Case Management in Madagascar*. Rational Pharmaceutical Management Plus (RPM Plus), A2Z Micronutrient and Child Blindness Project, Hellen Keller International and Basic Support for Institutionalizing Child Survival for the United States Agency for International Development.
- Alderman, H. (2007). Improving Nutrition through Community Growth Promotion: Longitudinal Study of the Nutrition and Early Child Development Program in Uganda. *World Development*, 35, pp. 1376-1389.
- Alderman, H., & Behrman, J. (April 2004). *Estimated Economic Benefits of Reducing Low Birth Weight in Low-Income Countries*. HNP Discussion Paper. Washington: World Bank.
- Alderman, H., Haddad, L., Appleton, S., Song, L., & Yohannes, Y. (2003). Reducing Child Malnutrition: How far does income growth take us? *World Bank Economic Review*, 17 (1), 107-131.
- Amendola, N., & Vecchi, G. (2008). *Growth, Inequality and Poverty in Madagascar, 2001-2005*. Washington, DC: World Bank.
- Anello, E. (2006). *Ethical Infrastructure for Good Governance in the Public Pharmaceutical Sector*. Geneva, Switzerland: World Health Organization.
- Aucoin, P., & Heintzman, R. (2000). The dialectics of accountability for performance in public management reform. *International Review of Administrative Sciences*, 66 (1), 45-55.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman.
- BASICS II and USAID. *BASICS II Madagascar Immunization Report: September 2001- April 2004*. Arlington, VA, 2004: Basic Support for Institutionalizing Child Survival Project (BASICS II) for the United States Agency for International Development.
- Binet, C., & Gastineau, B. (2005). *L'Avortement à Madagascar*. Marseille, France: Institut de Recherche pour le Développement and Laboratoire Population Environment Développement.
- Bjorkman, Reinikka, & Svensson. (2006). *Local Accountability*. Stockholm University, Institute for International Economic Studies.
- Black, R. E., Allen, L. H., Bhutta, Z. A., Caulfield, L. E., de Onis, M., Ezzti, M., et al. (2008). Maternal and Child under-nutrition: global and regional exposures and health consequences. *Lancet*, 371, pp. 243-60.
- Boserup, E. (1970). *Woman's Role in Economic Development*. Allen & Unwin.
- Brinkerhoff, D. W. (2004). Accountability and health systems: toward conceptual clarity and policy relevance. *Health Policy and Planning*, 19 (6), pp. 371-379.

- Brinkerhoff, D. W. (May 31- June 3, 2005). Pro-poor health services in Madagascar: Decentralization and Accountability. *Global Health Council*. Washington, DC.
- Chopra, M., Munro, S., Lavis, J., Vist, G., & Bennett, S. (2008). Effects of policy options on human resources for health: an analysis of systematic reviews. *Lancet*, 371, 668-674.
- Claeson, M., Griffin, C. C., Johnston, T. A., McLachlan, M., Soucat, A. L., Wagstaff, A., et al. (2002). Health Nutrition and Population. In J. Klugman, *A Sourcebook for Poverty Reduction Strategies* (pp. 201-230). Washington, DC: World Bank.
- Coppola, P. (2003). *Appui à la mise en place des coopératives aunières de Toliara dans le développement de leur Métier*. Antananarivo, Madagascar.
- Dal Poz, M. R., Gupta, N., Quain, E., & Soucat, A. L. (2009). *Handbook on monitoring and evaluation of human resources for health: with special applications for low- and middle-income countries*. World Health Organization, World Bank, and United States Agency for International Development.
- Deaton, A. (2007). Height, Health and Development. *Proceedings of the National Academy of Sciences*, 104 (33), pp. 13232-13237.
- Demangel, P. (January 2008). *Appui à la maîtrise du budget de programme et de la fonction budgétaire centrale*. Antananarivo, Madagascar.
- Derriennic, Y. (2009). *POUZN Project Trip Report Madagascar*. USAID.
- Di Tella, R., & Savdoff, W. D. (2001). *Diagnosis Corruption*. Washington, DC: IADB.
- Dubois, C.-A., Boivin, S., & Albert, L. (2007). *Elaboration du Plan de Développement des Ressources Humaines pour le Secteur Santé*. Montreal, Canada: Unite de Santé International/CHUM.
- Eisele, D. (May 29, 2008). *Aide Memoire of mission to Madagascar to ensure coordination of World Bank activities with current/planned malaria control efforts*. Antananarivo, Madagascar.
- Engle, P., Black, M., Behrman, J., Cabral de Mello, M., Gertler, P., Kapiriri, L., et al. (2007). Strategies to Avoid the Loss of Developmental Potential in More than 200 Million Children in the Developing World. *The Lancet*, 369 (9557), 229-242.
- Food and Agriculture Organization. (2005). *Profil Nutritionnel de Madagascar*. Division de l'Alimentation et de la Nutrition.
- Galasso, E., & Umapathi, N. (2007). *Improving Nutritional Status through Behavioral Change: Lessons from Madagascar*. Washington, DC: The World Bank—Development Research Group.
- Gastineau, B., & Razafiarison, J. C. (2005 March). L'avortement à Madagascar. *Bulletin d'Information sur la Population de Madagascar*, pp. 1-3.
- Glewwe, P., & Jacoby, H. (1995). An Economic Analysis of Delayed Primary School enrollment in a Low Income country: The Role of Early Childhood Nutrition. *Review of Economics & Statistics*, 77 (1), pp. 156-169.
- Glewwe, P., Jacoby, H., & King, E. (2001). Early Childhood Nutrition and Academic Achievement: A Longitudinal Analysis. *Journal of Public Economics*, 81 (3), pp. 345-368.
- Glick, P. (2007). *Are client satisfaction surveys useful? Evidence from matched facility and household data in Madagascar*. Ithaca, NY: Cornell University.
- Glick, P., & Razakamanantsoa, M. (2002). *The Distribution of Social Services in Madagascar, 1993-99*. Ilo Project, Cornell University.

- Glick, P., Randriamamonjy, J., & Sahn, D. E. (2008). *Determinants of HIV Knowledge and Condom Use among Women in Madagascar: An Analysis Using Matched Household and Community Data*. Ithaca, NY: Cornell University.
- Glick, P., Razafindravonona, J., & Randretsa, I. (2000). *Education and Health Services in Madagascar: Utilization Patterns and Demand Determinants*. Antananarivo, Madagascar.
- Glick, P., Younger, S. D., & Sahn, D. E. (2006). *An Assessment of Changes in Infant and under-Five Mortality in Demographic and Health Survey Data for Madagascar*.
- Gottret, P., Tandon, A., Sparkes, S., Gupta, V., Moran, V., & Berman, P. (2009). *Protecting Pro-Poor Health Services during Financial Crisis: lessons from experience*. Health Nutrition and Population Network. Washington, DC: World Bank.
- Grantham-McGregor, Fernald, L., & Ani, C. (2000). The role of nutrition in intellectual and behavioral development in children. In R. Sternberg, *Environmental Effects on Cognitive Abilities*. Cambridge: Laurence Erlbaum Associates.
- Grantham-McGregor, S., Bun Cheung, Y., Cueto, S., Glewwe, P., Richter, L., & Strupp, B. (2007 6-January). Developmental potential in the first 5 years for children in developing countries. *The Lancet*, 369 (9555), pp. 60-70.
- Haddad, L. (2002). *Reducing child undernutrition*. FCND Discussion Paper no. 137. Washington: International Food Policy Research Institute.
- Hantaniaina, R. (1995). *Rapport de l'évaluation des 7 postes sentinelles TDCI*. Service de Nutrition et Alimentation, Antananarivo.
- Health Nutrition and Population. (2004). *At a Glance: Anemia*. World Bank Group.
- Health Research for Action. (July 2008). *Aide Memoire: Support mission regarding the definition of the component "deconcentration and development of basic service health centers"*. Antananarivo, Madagascar.
- Hoftijzer, M., & Paci, P. (2008). *Making work pay in Madagascar – Employment, Growth, and Poverty Reduction*. Washington, DC: World Bank.
- Institut National de la Statistique and World Bank. (2005). *L'efficience et l'equite des formations sanitaires Malagaches: Resultats d'une enquete 2003*. Washington: World Bank.
- Institut National de la Statistique and World Bank. (2005). *Survey: L'Efficience et l'Equite des Formation Sanitaires*. Antananarivo, Madagascar: unpublished.
- Institut National de la Statistique. (1997). *Enquête Anthropométrique et Développement de l'Enfant*. Programme de Surveillance et d'Education des Ecoles et Communauté en matière d'Alimentation et Nutrition Elargie, Antananarivo, Madagascar.
- Institut National de la Statistique. (2004). *Enquête Anthropométrique et Développement de l'Enfant*. Programme de Surveillance et d'Education des Ecoles et Communauté en matière d'Alimentation et Nutrition Elargie.
- Institut National de la Statistique. (2007). *Enquête Anthropométrique et Développement de l'Enfant*. Programme de Surveillance et d'Education des Ecoles et Communauté en matière d'Alimentation et Nutrition Elargie.
- Institut National de la Statistique. (2006). *Enquête périodique auprès de ménages 2005: rapport principal*. Ministère de l'Economie, des Finances et du Budget, Secrétariat Général. Antananarivo, Madagascar: INSTAT.
- Institut National de la Statistique and ICF Macro. (1992). *Enquête Démographique et de Santé Madagascar 1992*. Antananarivo.

- Institut National de la Statistique and ICF Macro. (1997). *Enquête Démographique et de Santé Madagascar 1997*. Antananarivo.
- Institut National de la Statistique and ICF Macro. (2004). *Enquête Démographique et de Santé Madagascar 2003-2004*. Antananarivo.
- Institut National de la Statistique and ICF Macro. (2010). *Enquête Démographique et de Santé Madagascar 2008-2009 (draft report)*. Antananarivo.
- Institut National de la Statistique, Le Centre National de la Recherche Appliquée au Développement Rural, and Ilo Project. (2001). *Commune Census*. Antananarivo, Madagascar.
- Institute National de la Statistique. (2005 November). Survey on Efficiency and Equity of Health Centers. Antananarivo, Madagascar: INSTAT.
- Kaufman, D., & Kraay, A. (2008). Governance Indicators: Where are we, where should we be going? *The World Bank Research Observer*, 23 (1).
- Kaufman, D., Kraay, A., & Mastruzzi, M. (2003). *Governance matters III: Governance Indicators for 1996-2002*. Washington, DC: World Bank.
- Keener, S., & Brinkerhoff, D. W. (2003). *District-level Service Delivery in Rural Madagascar: Accountability in Health and Education*. Washington, DC: World Bank.
- Keener, S., Walker, W. M., & Hall, D. (2007). *Analyse de la pauvreté et de l'impact social. Le soins de sante et les pauvres*. Washington, DC: World Bank.
- Lewis, M. (2006). *Governance and Corruption in Public Health Care Systems*. Washington, DC: Center for Global Development.
- Lewis, M. (2002). Informal Health Payments in Central and Eastern Europe and the Former Soviet Union: Issues, Trends, and Policy Implications. In J. Figueres, & E. Moussiales, *Funding Health Care: Options for Europe* (pp. 184-205). Buckingham: Open University Press.
- Lewis, M. (2000). *Who is Paying for Health Care in Eastern Europe and Central Asia*. Washington, DC: World Bank.
- Lewis, M., & Pettersson, G. (2009). *Governance in health care delivery: raising performance*. Washington, DC: World Bank.
- Lewis, M., Eskeland, G., & Traa-Valarezo, X. (2004). Effectiveness and Impact of Rural Health Care Policies in El Salvador. *Health Policy*, 70 (3), 303-325.
- Lindelow, M., Serneels, P., & Lemma, T. (2003). *Synthesis of Focus Group Discussions with Health Workers in Ethiopia*. Washington, DC: World Bank.
- Lindelow, M., Ward, P., & Zorzi, N. (2004). *Expenditure Tracking and Service Delivery Survey: the health sector in Mozambique*. Washington, DC: World Bank.
- Loevinsohn, B. (2008). *Contracting for Health Services in Developing Countries*. Washington, DC: World Bank.
- Macquet, F., & TransMad, O. (2004). *Etat des lieux dans le cadre de la mise en place d'un système de production de sel de qualité iodé et fluoré à Toliara*. Antananarivo, Madagascar.
- Mapping Malaria Risk in Africa. (2001 June). *Madagascar: Duration of the Malaria Transmission Season*. Retrieved 2009 15-July from Maps of Malaria: <http://www.mara.org.za/pdfmaps/MadSeasonality.PDF>.
- May, J. (2006). *Dimension Population et Lutte contre la Pauvreté a Madagascar*. Aide Memoire, World Bank Group.

- McPake, B., Asimwe, D., Mwesigye, F., Ofumbi, M., Ortenblad, L., Streefland, P., et al. (1999). Informal economic activities of public health workers in Uganda: implications for quality and accessibility of care. *49* (7), 849-685.
- Medical Care Development International. (October 2005). *Child Survival Project Mid-Term Evaluation: Toliara Province*. Antananarivo, Madagascar.
- Ministère de la Santé du Planning Familial et de la Protection Sociale. (2007). *Resultats de l'Enquete de Surveillance Biologique de la Syphilis et de l'Infection par VIH*. Comité National de Lutte contre le VIH/SIDA, Antananarivo, Madagascar.
- Ministère de la Santé et du Planning Familial. (2008). *Analyse du profil épidémiologique et des déterminants de l'infection au VIH*. Direction Generale de la Lutte contre le SIDA, Antananarivo.
- Ministère de la Santé et du Planning Familial. (2007). *Annuaire des Statistiques du Secteur Santé*. Antananarivo.
- Ministère de la Santé et du Planning Familial. (1999). *Annuaire Statistique du Secteur Santé*. Antananarivo, Madagascar.
- Ministère de la Santé et du Planning Familial. (2004). *Annuaire Statistique du Secteur Santé*. Antananarivo, Madagascar.
- Ministère de la Santé et du Planning Familial. (2007). *Carte Sanitaire*. Antananarivo, Madagascar.
- Ministère de la Santé et du Planning Familial. (2003). *Comptes Nationaux de la Santé*. Antananarivo, Madagascar.
- Ministère de la Santé et du Planning Familial. (2010). *Comptes Nationaux de la Santé 2007*. Antananarivo.
- Ministère de la Santé et du Planning Familial. (2003). *Etude Combinee des Seroprevalences de l'infection a VIH et de la Syphilis chez les Femmes Enceintes*. Direction Generale de la Lutte contre le SIDA and Direction de la Surveillance Epidemologique des IST et du VIH/SIDA.
- Ministère de la Santé et du Planning Familial. (2007). *Health Expenditure Review, 2006/2007*. Antananarivo, Madagascar.
- Ministère de la Santé et du Planning Familial. (2004). *l'Enquête de Surveillance Comportementale*. Comité National de Lutte contre le SIDA.
- Ministère de la Santé et du Planning Familial. (2006). *l'Enquête de Surveillance Comportementale*. Comité National de Lutte contre le SIDA.
- Ministère de la Santé et du Planning Familial. (2008). *l'Enquête de Surveillance Comportementale*. Comité National de Lutte contre le SIDA.
- Ministère de la Santé et du Planning Familial. (2009). *Malaria National Level Report*. Service de Lutte contre le Paludisme.
- Ministère de la Santé et du Planning Familial. (2007). *Plan de Developpment du Secteur Sante et de la Protection Sociale, 2007-2011*. Antananarivo, Madagascar.
- Ministère de la Santé et du Planning Familial. (2007). *Plan de Développement du Secteur Santé et de la Protection Sociale, 2007-2011*. Antananarivo, Madagascar: Ministry of Health, Family Planning, and Social Protection.
- Ministere de la Sante, du Planning Familial et de la Protection Sociale. (2008). *Medium Term Expenditure Framework for the Health Sector, 2009-2011*. Antananarivo, Madagascar.

- Ministere de l'Interieur. (2007). *Rapport National de Suivi des OMD*. Antananarivo, Madagascar: United Nations.
- Minten, B., & Fafchamps, M. (2004). *Public Service Provision, User Fees, and Political Turmoil*. Ilo Project, Cornell University.
- Minten, B., & Ralison, E. (2005). Dynamics in Health Sector:2002-2004. In *Dynamics in Social Service Delivery and the Rural Economy of Madagascar: Descriptive results of the 2004 Commune Survey* (p. Chapter 3). Ilo Project, Cornell University.
- Minten, B., & Ralison, E. (2005). *Price and Welfare Dynamics in Rural Madagascar*. Antananarivo, Madagascar: first draft.
- Morrisson, C. (2002). *Depenses d'education, de sante et reduction de la pauvrete en Afrique de l'Est: Madagascar et Tanzanie*. Paris, France: OCDE, Etudes du Centre de Developpement.
- MSIS and Pact Madagascar. (October 2008). *Coordination et Gestion de mise en oeuvre du CSC au niveau de 20 CSB de la Region de l'Anosy*. Antananarivo, Madagascar.
- Noirhomme, M., Criel, B., & Meessen, B. (2005). *Feuille de route pour le developpement de Fonds d'Equite Hospitaliers a Madagascar*. Antananarivo, Madagascar.
- Nyangara, F., Hart, C., Spizer, I., & Moreland, S. (2007). *Unmet Need for Family Planning in Rwanda and Madagascar: An Analysis Report for the Repositioning of Family Planning Initiatives*. MEASURE Evaluation Project.
- O'Donnell, O., van Doorslaer, E., Wagstaff, A., & Lindelow, M. (2008). *Analyzing Health Equity Using Household Survey Data: A guide to techniques and their implementation*. Washington, DC: The World Bank.
- Over, M. (2005). *Analysis of the impact of user-fee suspension for the Health Sector Note, May 2005*. Washington, DC: unpublished.
- Over, M., & Wane, W. (2005). *Analysis of the 2003 EEEFS*. Washington, DC: unpublished.
- Population Reference Bureau. (2009). *World Population Data Sheet*.
- Population Services International. (2009). *Madagascar: Diarrhea TRaC study evaluating the use of sur'eau among mothers/caregivers of children younger than five years. Third round*. Antananarivo, Madagascar.
- President's Malaria Initiative. (2008). *Malaria Operational Plan, FY 09*.
- Putnam, R., & Leonardi, R. (1993). *Making Democracy Work*. Princeton: Princeton University Press.
- Ralison, E. (2002). *Impact of the Political Crisis on the Health Sector: Results of a rapid survey of urban and rural health centers during the month of June 2002 (draft)*. Ithaca, NY: Cornell University.
- Ralison, E. (2003). *Monitoring and Analysis of the Health Sector Post-Crisis: The impact of the abolishment of the cost recovery policy*. Ithaca, NY: Cornell University.
- Ranjalahy Rasolofomanana, J., & Ralisimalala, A. (2009). *Mortalite Maternelle et Mortalite Neonatale Precoce a Madagascar: Analyse des determinants de la forte mortalite et evaluation des strategies*. Antananarivo, Madagascar.
- Ranjalahy Rasolofomanana, J., & Ralisimalala, A. (2009). *Reduction de la Mortalite Maternelle et de la Mortalite Neonatale Precoce a Madagascar: Actions et interventions*. Antananarivo, Madagascar.
- Razafimanjato, J., & Deux, D. (2008). *Appui Technique pour l'amélioration du processus budgétaire du Ministère de la Santé et du Planning Familial; revue comparative; recom-*

- mandations et plan d'action*. Antananarivo, Madagascar: Ministère de la Santé et du Planning Familial.
- Rubio, M. (1997). Perverse Social Capital - Some Evidence from Columbia. *Journal of Economic Issues*, 31 (3), 805-816.
- Ruel, M. T., & Menon, P. (2002). Creating Child Feeding Index Using Demographic and Health Surveys. *FCND Briefs* (131).
- Ruel, M. T., Armard-Klemesu, M., & Arimond, M. (2001). A multiple-method approach to study childcare in urban environments. *FCND Discussion Papers* (116).
- Ruel, M. T., Habicht, J.-P., Pinstруп-Andersen, P., & Grohn, Y. (1992). The Mediating Effect of Maternal Nutrition Knowledge on the Association between Maternal Schooling and Child Nutritional Status in Lesotho. *American Journal of Epidemiology*, 135 (8), 904-914.
- Rutstein, S. O., & Johnson, K. (2004). The DHS Wealth Index. *DHS Comparative Reports No.6*. Calverton, Maryland: ORC Macro.
- Schieber, G., & Gottret, P. E. (2006). *Health Financing Revisited: a practitioner's guide*. Washington, DC: World Bank.
- Sharp, M., & Francken, N. (2008). *Service Delivery in the Education and Health Sectors*. Washington DC: World Bank.
- Shimp, L. (May 2004). Demonstrating Communication Impact: Madagascar Case Study (Annex). In *Strengthening Immunization Programs: The Communication Component* (pp. 23-29). Arlington, VA: Basic Support for Institutionalizing Child Survival Project (BASICS II) for the United States Agency for International Development.
- Siddiqi, S., Masud, T., Nishtar, S., Peters, D. H., Sabri, B., Bile, K. M., et al. (2009). Framework for assessing governance of the health system in developing countries: Gateway to good governance. *Health Policy*, 90, 13-25.
- Stifel, D., Rakotomanana, F. H., & Celada, E. (July 2007). *Assessing Labor Market Conditions in Madagascar: 2001-2005*. Washington, DC: World Bank.
- Stifter, C. A., & Bono, M. (1998). The effect of infant colic on maternal self-perceptions and mother-infant attachment. *Child: Care, Health, and Development*, 24, pp. 339-351.
- Svedberg, P. (1990). Undernutrition in Sub-Saharan Africa: Is there a gender bias? *Journal of Development Studies*.
- Terris-Prestholt F, W.-J. D. (2003). Is antenatal syphilis screening still cost effective in sub-Saharan Africa. *Sexually Transmitted Infections*, 79 (5), 375-81.
- Teti, G. M., & Gelfand, G. M. (1991). Behavioral competence among mothers of infants in the first year: The mediational role of maternal self-efficacy. *Child Development*, 62, pp. 918-929.
- The Commission on Macroeconomics and Health. (2002). *Macroeconomics and Health: Investing in Health for Economic Development*. Geneva, Switzerland: World Health Organization.
- Thirion, D. (2007). *Evaluation de la Mise en Oeuvre du Nouveau Code des Marches au Ministère de l'Education Nationale et de la Recherche Scientifique et au Ministère de la Santé et du Planning Familial: Rapport Préliminaire*. Antananarivo, Madagascar.
- UNICEF. (n.d.). *Info by Country*. Retrieved 2009 12-May from Madagascar Statistics: http://www.unicef.org/infobycountry/madagascar_statistics.html.
- UNICEF, Roll Back Malaria, and The Global Fund. (2009). *Malaria and Children: Progress in intervention coverage*. New York: UNICEF.

- United Nations Children's Fund. (2009). *The State of the World's Children*. New York: UNICEF.
- United Nations Country Team. (6 May 2009). *Humanitarian Situation in Madagascar*.
- United Nations World Food Programme. (2005). *Comprehensive Food Security and Vulnerability Analysis of Madagascar*.
- United States Agency for International Development. (2006 22-September). *Achieving the MDGs: The contribution of family planning in Madagascar. Health Policy Initiative*. Washington, DC.
- Various authors. (2008 January-February). The Maternal and Child Undernutrition. *The Lancet*, 371 (9608-9611).
- Vice Primature Chargee de la Sante Publique. (2010). *Evaluation des besoins en matiere de soins obstetricaux et neonatals d'urgence a Madagascar*. Antananarivo, Madagascar.
- Warren, M. (2004). Social Capital and Corruption. In D. Castiglione, *Social Capital: Interdisciplinary Perspectives* (pp. 16-18). Oxford: Oxford University Press.
- WHO Global Database on Anemia. (2008). *Worldwide prevalence of anaemia 1993-2005*. Geneva: World Health Organization.
- World Bank. (August 2009). *Aide Memoire: Supervision mission of the Sustainable Health System Development Project*.
- World Bank. (February 2007). *Analyse de la Pauvreté et de l'Impact Social - les Soins de Santé et les Pauvres*. Antananarivo, Madagascar.
- World Bank. (2007). *Country Assistance Strategy for the Republic of Madagascar for FY 2007-2011*. Washington, DC.
- World Bank. (May 2009). *Madagascar Economic Update*. Antananarivo, Madagascar.
- World Bank. (July 2009). *Madagascar Economic Update: unexpected but fragile stability in the economy*.
- World Bank. (2008). *Madagascar Fifth Poverty Reduction Support Credit*. Washington, DC.
- World Bank. (2007). *Madagascar Public Expenditure Review: Implementation of the Madagascar Action Plan*. Washington, DC.
- World Bank. (2005). *Madagascar Public Expenditure Review: the challenge of poverty reduction*. Washington, DC.
- World Bank. (2008). *Madagascar: Understanding the 2009 Budget Law*. Antananarivo, Madagascar.
- World Bank. (March 2008). *Mesure de la Performance de la Gestion des Finances Publiques en République de Madagascar; selon la méthodologie PEFA*. Antananarivo, Madagascar: draft version.
- World Bank. (2008). *Project Appraisal Document for the Second Governance and Institutional Development Project*. Washington, DC: World Bank.
- World Bank. (2007). *Risk Management and Social Protection Strategy for Madagascar*.
- World Bank. (November 2008). *Scale-up of the Community Scorecard Process in the Madagascar Health Sector*. Discussion Draft, Washington, DC.
- World Bank. (2008). *Social Accountability in the Health Sector in Madagascar - Community Score Card Pilot Summary*.
- World Bank. (August 2009). *Supervision Aide memoire of the Second Multi-sectoral STI/HIV/AIDS Prevention Project*.
- World Bank. (2004). *World Development Report 2004: Making Services World for Poor People*. Washington, DC: World Bank.

- World Development Indicators. (2009 24-April). *World Bank Data—WDI, GDF, & ADI Online Database*. Retrieved 2009 15-July from Data and Statistics: <http://go.worldbank.org/B53SONGPA0>
- World Health Organization. (n.d.). *WHO Statistical Information System*. Retrieved 2010 30-January from <http://www.who.int/whosis/en/>
- World Health Organization. (2008 November). *Action against Worms*. Geneva, Switzerland.
- World Health Organization. (2006). *Africa Regional Health Report*. WHO Regional Office for Africa, Geneva, Switzerland.
- World Health Organization. *Country Health System Fact Sheet 2006*. Geneva, Switzerland.
- World Health Organization. (2001). *Global Prevalence and Incidence of Selected Curable Sexually Transmitted Infections. Overview and Estimates*. Geneva: World Health Organization.
- World Health Organization. (2009). *Global Tuberculosis Database*. Retrieved 2009 15-July from Global Health Atlas: <http://apps.who.int/globalatlas/dataQuery/default.asp>
- World Health Organization. (2003). *Survey on migration of health workers in the Africa Region*. WHO Regional Office for Africa, Brazzaville.
- World Health Organization. (2005). *The World Health Report 2005; Make every mother and child count*. Geneva, Switzerland.
- World Health Organization Vitamin and Mineral Nutrition Information System. (2006 06-12). *Global Database on Iodine Deficiency*.
- World Health Organization. (2006). *WHO Child Growth Standards: Length/Height-for-age, weight-for-age, weight-for-length, weight-for-height, and body mass index-for-age: Methods and development*. Retrieved 2009 22-March from <http://www.who.int/childgrowth/publications/en>
- World Health Organization. (2007). *World Health Statistics 2007*. Geneva, Switzerland.
- World Health Organization. (2008). *World Health Statistics 2008*. Geneva, Switzerland.
- World Health Organization. (2009). *World Health Statistics Report 2009*. Geneva, Switzerland.

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