Ministry of Health

Rwanda Health Statists Booklet 2011

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Table of Contents

List of Tables

List of Figures

Acronyms

ACT	Artemisinin-based Combination Therapy
ANC	Ante-natal Care
ARI	Acute Respiratory Infections
ART	Anti-retroviral Therapy
ARV	Anti-retrovirals
BCG	Bacille Calmette Guerin vaccination
CBHI	Community-based Health Insurance
CDC	Center for Disease Control
CDT	TB diagnosis and treatment centers
CHUB	Centre Hospitalier Universitaire de Butare
CHUK	Centre Hospitalier Universitaire de Kigali
CHW	Community Health Workers
C-IMCI	Community-based Integrated Management of Childhood Illnesses
CPT	Cotrimoxazole-preventive treatment
CT	TB treatment centers
CTX	Cotrimoxazole
DHS	Demographic and Health Survey
DHSST	District Health System Strengthening Tool
DOTS	Directly Observed Treatment, Short Course
DTP	Dyptheria, Tetanus, Pertusis vaccination
EDPRS	Economic Development and Poverty Reduction Strategy
EPI	Expanded Program on Immunizations
FBO	Faith-based Organization
FP	Family Planning
FRW	Rwandan franc
GESIS	Gestion du Système d'Information Sanitaire
G-O	Gynecology-obstetrics
HEPB	Hepatitis B vaccination
HiB	Hemophelus Influenza B vaccination
HIV & AIDS	Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome
HFS	Department of Health Financing
HMIS	Health Management Information System
HNP	Health, Nutrition and Population (HNP)
iHRIS	Integrated Human Resource Information System
IRS	Indoor residual spraying (IRS)
ITN	Insecticide Treated Nets
IUD	Intrauterine device
KFH	King Faical Hospital
KMH	Kanombe Military Hospital
KPH	Kacyiru Police Hospital
LLIN	Long-lasting insecticidal nets
MCH	Maternal and Child Health
MOH	Ministry of Health
MMR	Maternal Mortality Ratio
NGO	Non-governmental Organization
NID	National Identity Card
NISR	National Institute of Statistics Rwanda
NRH	National Referral Hospital

NTPM+	New pulmonary TB
OI	Opportunistic Infections
OPD	Out Patient Days
P0	Polio vaccination, dose zero
PBF	Performance-based Financing
PEPFAR	President's Emergency Plan for AIDS Relief
PIT	Provider-initiated testing
PLHIV	People Living with HIV
PMTCT	Prevention of Mother to Child Transmission (of HIV)
RDHSSF	Rwanda District Health System Strengthening Framework
RH	Referral Hospital
RIDHS	Rwanda Interim Demographic and Health Survey
SAMU	Service d'Assistance Médicale d'Urgence
SCPS	Service de Consultation Psychosociale
SS+	Sputum Smear Positive
TB	Tuberculosis
TPM+	Positive Microscope Pulmonary Tuberculosis
TPR	Test positivity rate
TRAC	Treatment Research and AIDS Center
TTI	Transfusion-transmissible infections
VAT2-5	Vvaccin anatoxine tétanique (tetanus toxoid vaccine)
VCT	Voluntary Counseling and Testing
WHO	World Health Organization

Foreword

As part of the Government of Rwanda's commitment to produce evidence-based policies and programs, it is imperative that we generate and publish reliable statistics and indicators that can be used by all stakeholders. Therefore, this Annual Rwanda Health Statistics Booklet has been produced to provide a summary of all key statistics from the Rwandan health sector in 2011.

This booklet provides policymakers, planners, and other interested parties with insight into the current state of the Rwandan health sector. These statistics provide a basis for policies, strategies, and planned interventions to ensure they are responsive to the needs of the health sector and, crucially, are focused on addressing current priorities that aim to improve the health of the Rwandan population.

Dr. Agnes Binagwaho
Rwandan Minister of Health

Introduction

The Ministry of Health (MOH) developed the Rwanda Annual Health Statistics Booklet 2011in order to provide an overview of key statistics in the health sector for 2011. This is the fourth year that the booklet has been produced and the first time that the MOH has had substantial data from two calendar years, thereby enabling an analysis of trends over time. In addition, the results of the 2010 Demographic and Health Survey (DHS) were released early in 2011 and have allowed the ministry to compare routinely collected service data with key indicators from this population-based survey.

The booklet is divided into four chapters entitled Infrastructure; Human Resources; Morbidity; and Special Programs. The Special Programs chapter includes national data on family planning (FP), tuberculosis (TB), HIV & AIDS, malaria and maternal and child health (MCH). This year, the booklet also includes a section on health financing interventions including performance-based financing (PBF) and community-based health insurance. Other macro-level financial information has not been included in this document, as this is covered substantially by the National Health Accounts and other special studies and reports.

This booklet aims to show key statistics in the health sector from 2011 in a concise, easily accessible manner to ensure that this valuable data is readily available to all interested parties. Comparisons with data from 2010 will help users to understand the evolving health situation in Rwanda.

Data have been extracted from a variety of sources including the Rwanda District Health System Strengthening Tool (DHSST), the Health Management Information System (HMIS), TracNet, PBF databases for clinical services, the Community Health Worker Information system (SIScom),the Community-based Health Insurance (CBHI) Indicator Database, and several surveys, including the Rwanda Interim DHS, 2010. Details of all data sources are included in Annex1

This document includes data from primary health care facilities and district hospitals managed by the public sector or faith-based organizations (FBOs) that operate under a convention with the MOH. Limited data is also included from national referral hospitals (NRHs) to provide a more comprehensive picture of Rwanda's infrastructure and disease burden. The booklet does not include data from private sector clinics or dispensaries, as these will begin to report systematically in 2012.

Health Sector Resources

Health sector infrastructure covered in this section includes health facilities and selected resources available within those facilities such as staff, equipment, utilities, and transport. It is important to note that this section draws data from multiple sources, primarily the Health Facilities Database, the MOH's Human Resource Database (iHRIS), and the DHSST. The coverage of the DHSST represents a sub-set of health facilities and, therefore, may not be entirely representative of national conditions.

Health Facilities

The number of non-private health facilities in Rwanda at the end of 2011 was 720; this is up from 579 in the previous year (see Tables 1 and 2). This increase was primarily due to the opening of 80 new health posts, 60 new dispensaries and 6 health centers. In the tables and figures below, these facilities are classified as referral hospitals, district hospitals, health centers, health posts, and dispensaries.

Table 1: Number of health facilities, 2009 - 2011

Year	2009	2010	2011
National Referral Hospitals	4	4	4
District Hospitals	40	40	40
Police/Military Hospital	1	1	1
Health Centers	428	436	442
Dispensaries	18	35	95
Prison Dispensaries	16	18	13
Health Posts	34	45	125
Total	541	579	720

Source: Health Facilities Database, HMIS Unit, 2009,2010, 2011

Table 2: Number and type of health facility by district, 2011

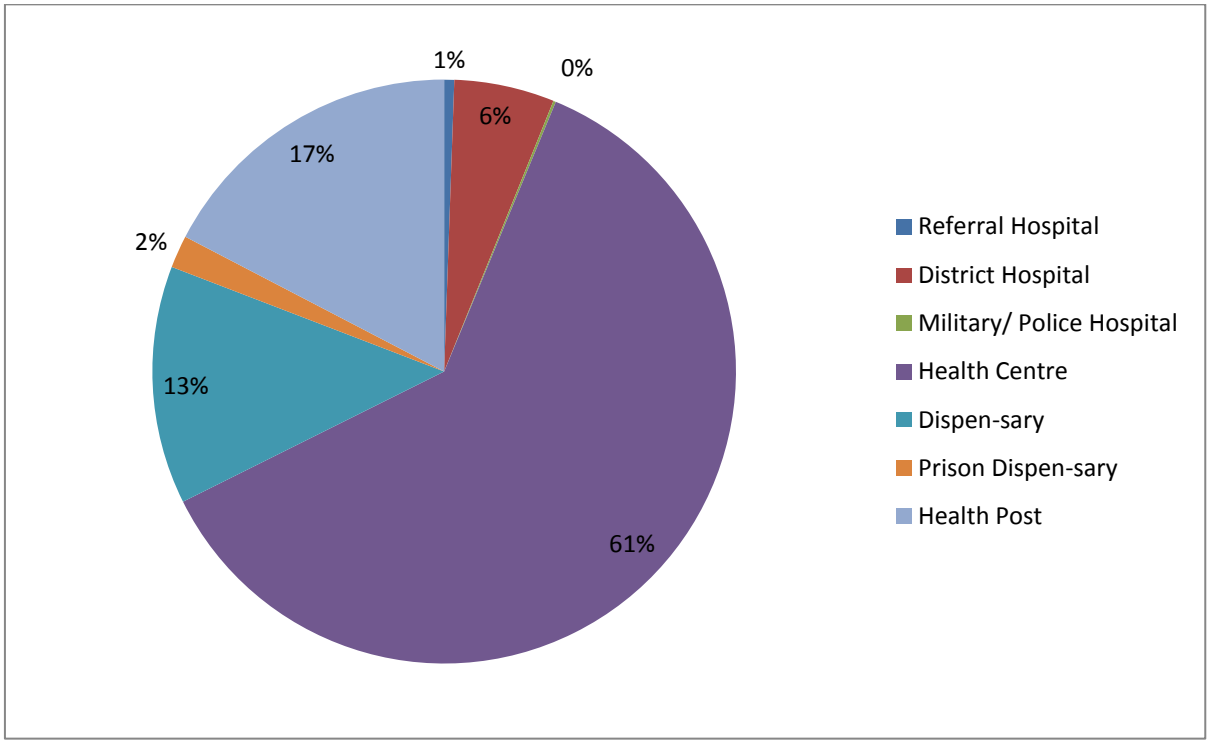
District	Referral Hospital	District Hospital	Military/ Police Hospital	Health Center	Dispensary	Prison Dispensary	Health Post	Total # of Health Facilities
Bugesera	0	1	0	12	0	1	9	23
Burera	0	1	0	15	0	0	6	22
Gakenke	0	2	0	19	0	0	2	23
Gasabo	2	1	1	16	22	1	6	49
Gatsibo	0	2	0	19	0	0	4	25
Gicumbi	0	1	0	21	0	0	4	26
Gisagara	0	2	0	13	0	0	1	16
Huye	1	1	0	8	0	1	0	11
Kamonyi	0	1	0	11	7	0	3	22
Karongi	0	3	0	22	1	0	3	29
Kayonza	0	2	0	14	2	0	1	19
Kicukiro	0	1	0	8	24	0	0	33
Kirehe	0	1	0	13	0	0	4	18
Muhanga	0	1	0	13	0	1	16	31
Musanze	0	1	0	13	4	0	0	18
Ngoma	0	1	0	12	0	1	5	19

Ngororero	0	2	0	20	0	0	0	22
Nyabihu	0	1	0	15	1	0	8	25
Nyagatare	0	1	0	20	0	1	0	22
Nyamagabe	0	2	0	16	0	1	2	21
Nyamasheke	0	2	0	19	0	0	20	41
Nyanza	0	1	0	16	0	2	0	19
Nyarugenge	1	1	0	8	31	1	0	42
Nyaruguru	0	1	0	16	0	0	5	22
Rubavu	0	1	0	9	0	1	5	16
Ruhango	0	1	0	12	0	0	0	13
Rulindo	0	1	0	14	0	0	4	19
Rusizi	0	2	0	17	0	1	7	27
Rutsiro	0	1	0	17	1	0	5	24
Rwamagana	0	1	0	14	2	1	5	23
Total	4	40	1	442	95	13	125	720

Source: HMIS National Health Facility Database (excludes private health facilities and community-funded health facilities), 2011

Of the 720 health facilities, 68% are health centers, 6% district hospitals, 9% health posts and 14% dispensaries (see Figure 1). There are also four referral hospitals, one police hospitals[1], and 13 prison dispensaries. This analysis, using data from the HMIS National Health Facility Database, it doesn't include private health facilities, only the health facilities managed by the public sector or by FBOs. The table3 gives classification of minimum Package of services provided by each health facility type.

Figure1: Distribution of health facilities by type, 2011



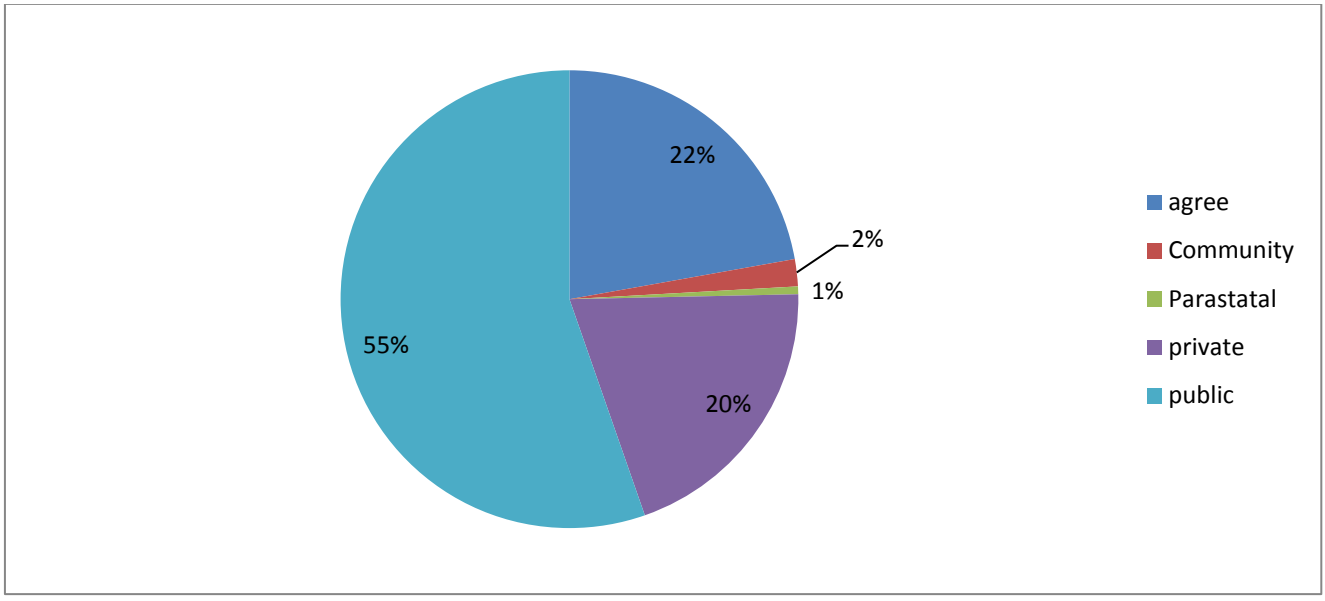
Source: HMIS National Health Facility Database, 2011

Table 3: Minimum package of services in different facilities

Health Facilities	Minimum Package of Services Provided
National Referral Hospital	Advanced inpatient/outpatient services, surgery, laboratory, gynecology, obstetrics, and radiology; specialized services including ophthalmology, dermatology, ear nose and throat, stomatology, and physiotherapy
District Hospitals	Inpatient/outpatient services, surgery, laboratory, gynecology obstetrics, an radiology
Health Centers	Prevention activities, primary health care, inpatient, referral, and Maternity
Dispensaries	Primary health care, outpatient, and referral
Health Posts	Outreach activities (i.e., immunization, family planning, growth monitoring, ANC)

Referral hospitals also serve also as teaching institutions for doctors and pharmacists. For example, Ndera Hospital is a referral hospital for mental health. As shown in Figure 2, public health facilities represent 55% of the total number of non-private health facilities in Rwanda, and an additional 22% are run by faith-based organizations (FBOs), 20% by private organizations, 2% by communities, and 1% by parastatal organizations.

Figure 2: Distribution of health facility by management authority,2011



Source: HMIS National Health Facility Database, 2011

Health Facility Equipment and Utilities

Rwanda's DHSST[2] is a web-based database maintained by all of the districts with data on 488 health facilities, 40 of which are district hospitals and 448 health centers. According to this database, 15% of health centers had no access to power in 2010 – a figure that was reduced by nearly half, to 9%, in 2011 (see Table 4). The improvements have come about mostly because of additional sites being added to the power grid and the purchase of generators and solar installations.

[2]The DHSST does not include health posts or dispensaries

Table 4: Availability of power in health facilities, 2009 - 2011

	Health Centers						District Hospitals					
Power Status	**2009**	**%**	**2010**	**%**	**2011**	**%**	**2009**	**%**	**2010**	**%**	**2011**	**%**
No Power	79	19%	64	15%	38	9%	1	2%	0	0%	0	0%
Some Power but Inconsistent Grid, Generator, or Solar	176	42%	196	46%	166	38%	6	15%	8	20%	2	5%
Connected to Grid with Consistent Access	166	39%	164	39%	235	54%	33	83%	32	80%	38	95%
Total	**421**		**424**		**439**		**40**		**40**		**40**	

Source: Rwanda District Health System Strengthening Tool, 2009-2011

The DHSST also showed improvements in availability of reliable electricity sources between 2010 and 2011. There was a slight increase in the proportion of facilities connected to the electricity grid, which rose from 46% in 2010 to 51% in 2011. Solar energy use decreased from 33% in 2010 to 26% in 2011. Most other electricity sources remained proportionally the same (see Table 5).

Table 5: Primary source of electricity in health facilities, 2009 - 2011

Primary Electricity Source	2009	Percentage	2010	Percentage	2011	Percentage
Electricity Grid	198	43%	213	46%	260	51%
Generator	54	12%	49	11%	41	8%
Solar Energy	147	32%	155	33%	134	26%
Biogas	2	0%	1	0%	0	0%
Other	40	9%	7	2%	0	0%
No Power	21	5%	40	9%	75	15%

Source: Rwanda District Health System Strengthening Tool, 2009-2011

According to the DHSST, the proportion of facilities using local surface water rose from 18% in 2009 to 26% in 2011 (see Table 6).

Table 6: Availability of water in health facilities, 2009 - 2011

Primary Water Sources	2009	%	2010	%	2011	%
Local Water System	149	32%	127	27%	82	17%
National Grid	121	26%	138	30%	125	26%
Rainwater Harvesting	95	21%	93	20%	95	20%
Local Surface Water	84	18%	86	18%	123	26%
Well or Borehole, Covered	6	1%	3	1%	4	1%
Well or Borehole, Uncovered	4	1%	4	1%	1	0%
Tanker Truck	2	0%	3	1%	7	1%
Unknown	1	0%	-	-	12	3%
No Source	-	-	12	3%	28	6%

Source: Rwanda District Health System Strengthening Tool, 2009-2011

Communication

In 2011, all district hospitals were connected to the internet and had cell phone coverage (up from 95% in 2010). Internet connectivity improvements were also seen at the health center level where 83% of facilities had access to the internet in 2011, as opposed to 65% in 2010 and 41% in 2009 (see Table 7).

Table 7: Internet/telephone access for district hospitals and health centers, 2009 - 2011

		District Hospitals		Health Centers	
	Year	Number	%	Number	%
Internet	2009	36	88%	171	41%
	2010	40	100%	275	65%
	2011	40	100%	370	83%
Cell Phone Coverage	2009	38	95%	377	90%
	2010	38	95%	412	97%
	2011	40	100%	411	92%

Source: Rwanda District Health System Strengthening Tool, 2009-2011

All district hospitals had more than one computer in 2011. At the health center level, 3% of facilities did not have a computer and 77% had more than one computer in 2011 (see Table 8).

Table 8: Availability of computers in district hospitals and health centers, 2009 - 2011

	Availability of Functioning Computers	no computers	1 computer	>1 computer	N
Health Centers	2009	71	60	290	421
		17%	14%	69%	100%
	2010	22	37	366	425
		5%	9%	86%	100%
	2011	12	89	337	438
		3%	20%	77%	100%
District Hospitals	2009	0	1	41	41
		0%	2%	98%	100%
	2010	0	0	40	41
		0%	0%	100%	100%
	2011	0	0	40	40
		0%	0%	100%	100%

Source: Rwanda District Health System Strengthening Tool, 2009-2011

The table below shows the number of beds by health facilities' types. Overall, the bed/inhabitants ratio remains the same at 1.6 beds for every 1,000 inhabitants in both 2010 and 2011.

Table 9: Number of inpatient beds by health facility type, 2010 - 2011

Facility types	2010	2011
District Hospital	6,664	6,663
Health Center	9,585	9,684
Referral Hospitals	959	946
Total	17,208	17,293

Source: Rwanda District Health System Strengthening Tool and reports from referral hospitals, 2010 and 2011

The number of ambulance at the district hospital level increased by 90% from 39 in 2010 to 74 in 2011. The number of other types of vehicles also increased at district hospitals, from 41 in 2010 to 124 in 2011. The average number of vehicles is 3 per district hospital . At the health center level, however, the number decreased from 323 in 2010 to 268 in 2011 (see Table 10).

Table 10: Vehicles access at district hospitals and health centers, 2009 - 2011

	Vehicle Type	Ambulance	Non-ambulance
District Hospitals	2009 (N=40)	39	41
	2010 (N=40)	39	41
	2011 (N=40)	74	124
Health Centers	2009 (N=421)	64	379
	2010 (N=425)	66	323
	2011 (N=448)	65	268

Source: Rwanda District Health System Strengthening Tool, 2009-2011

Regarding the facilities' equipment supplies, the DHSST found that, in 2011, all district hospitals and 99% of health centers had a microscope, 98% of hospitals and 95% of health centers had a refrigerator, 88% of district hospitals and 57% of health centers had an autoclave, and 90% of district hospitals and 65% of health centers had an incinerator (see Table 11). At the district hospitals, however, there were fewer functional x-ray machines, autoclaves, and anesthesia machines in 2011 than there had been in 2010. This decreased quantity of functional supplies may reflect the hospitals' lack of resources for systematic service and maintenance.

Table 11: Facilities with selected, fully functional equipment, 2011

	District Hospital				Health Center			
	2010 (N=40)		2011 (N=40)		2010 (N=421)		2011 (N=448)	
Binocular Microscope	37	93%	40	100%	405	95%	443	99%
Refrigerator	34	85%	39	98%	372	88%	426	95%
X-ray	37	93%	36	90%	n/a	n/a	n/a	n/a
Autoclave	37	93%	35	88%	412	97%	257	57%
Anesthesia Machine	37	93%	31	78%	0	0%	0	0%
Incinerator	34	85%	36	90%	275	65%	290	65%

Source: District Hospital Annual Report, 2011

Human Resources

In 2011 there were 625 doctors and 8,513 nurses/midwives working in Rwanda. Based on 2011 data from the Ministry of Health Human Resources Database (iHRIS), this corresponds to a ratio of 1 doctor per 17,149 inhabitants, 1 midwife per 44,660 inhabitants, and 1 nurse per 1,296 inhabitants. This situation has improved since 2010 when the worst off district had nearly 66,749 inhabitants per midwife.

The number of health care staff increased most significantly among nurses, paramedical, pharmacist, and midwives (see Table 12). According to the table the most significant increases were among, Midwives (33%), Pharmacists (11%), Environmental Officers (10%), Educators (5%)
The only category that saw a reduction was administrative and support staff.

Table 12: Ratio of health workers to population, 2010 - 2011

Staff Category	2010	2011	Population/ health workers 2011:	% Change 2010-2011
Doctors	604	625	17,149	1%
Nurses	8,046	8,273	1,296	0%
Midwives	156	240	44,660	33%
Paramedical	613	656	16,339	4%
Pharmacist	72	83	129,137	11%
Laboratory Technician	1,144	1,187	9,030	1%
Administrative and Support Staff	2,509	2,156	4,971	-20%
Social Workers	1,099	1,192	8,992	5%
Environmental Officers	200	230	46,602	10%
Educators	131	142	75,482	5%

Source: MOH's Human Resources Database, 2011

Morbidity and Mortality

Data on morbidity and mortality presented in this booklet are from the HMIS Database. In 2011, HMIS data did not cover private facilities or referral hospitals, except in a few key areas. The reporting rate of morbidity and mortality data from health facilities is almost 98%.

Outpatient Care

In 2011, health facilities in Rwanda saw a total of 7,940,927 new patients (see Table 13). Among these new cases, 6,985,028 (88%) patients were seen at health centers, 444, 463(5.6%) at district hospitals, 220,206 (2%) at referral hospitals, and 291,230 (4.4%) were seen by community health workers (CHWs) practicing community-based integrated management of childhood illnesses (C-IMCI).

During 2011, the primary health care utilization rate was approximately 0.6 visits per inhabitant (6,985,028 visits/ 10,718,378).

Table 13: Number of new cases among outpatient visits in health centers and district hospitals, 2009 - 2011

Health Service Level	2009	2010	2011	% change
Health Centers	7,996,598	8,437,850	6,985,028	-17%
District Hospitals	544,284	590,290	444,463	-25%
CHW Home-based Care	514,069	750,423	291,230	-61%
Referral Hospitals	214,512	197,278	220,206	+11.6%
Total	9,481,389	10,139,429	7,940,927	-22%

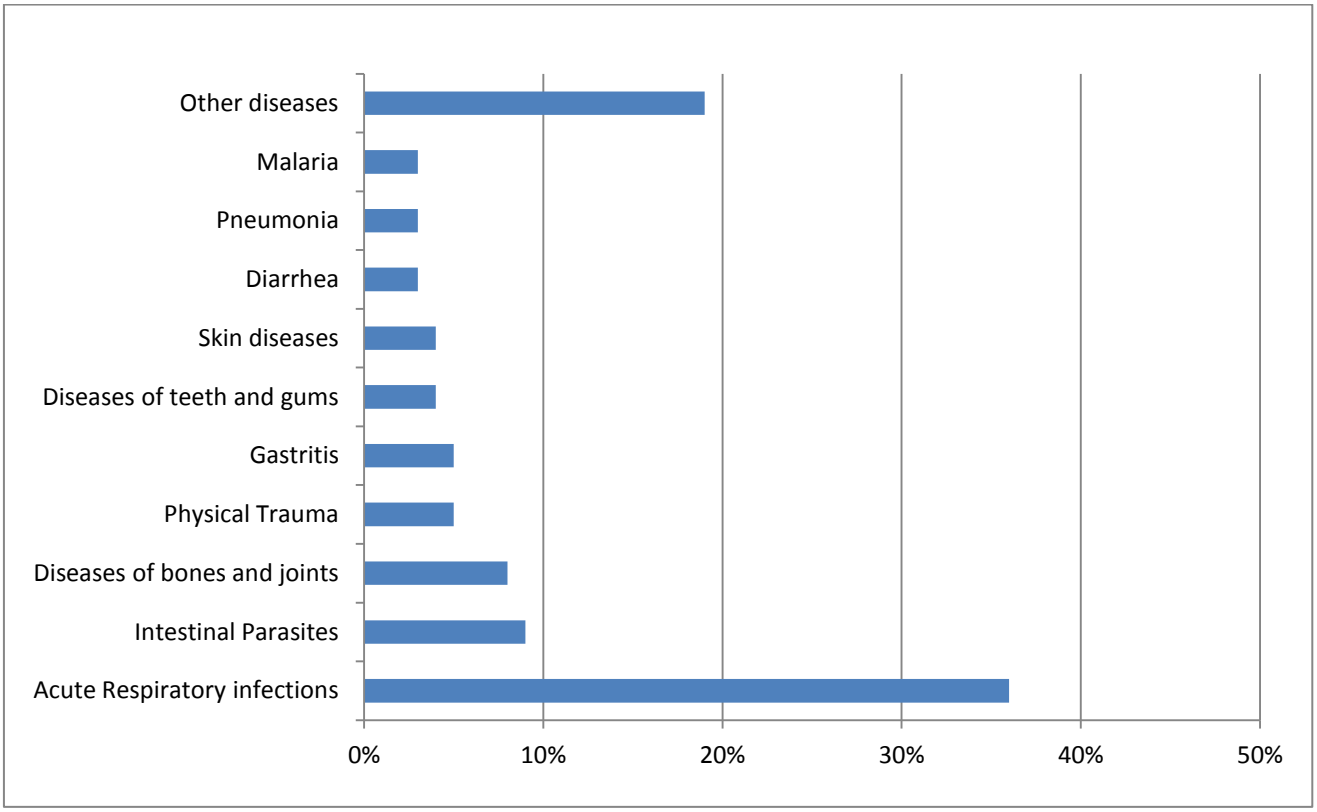
Sources: National HMIS Database, 2011; CHW Health Information System, 2009-2011

The table above shows that there was a decrease in outpatient visits in 2011, as compared to 2010. This may be the result of decreases in malaria and acute respiratory infections (ARIs), which were the main causes of outpatient's visits in Rwanda in 2010. Financial barriers may be one of the reasons, however we also noticed a decrease in CHW home-based care from 2010 to 2011 which are given freely. The diseases treated are childhood infections including fever/ malaria, ARIs, and diarrhea.

Health Centers' Outpatient Morbidity

The most frequent causes of outpatient visits at health centers were ARIs and intestinal parasites; together, these problems caused almost half of all outpatient visits (45%) in 2011 (see Figure 3). ARIs, pneumonia, intestinal parasites, and diarrhea were the most common diseases among children under five who were seen at health centers for outpatient visits (see Table 14).

Figure 3: Causes of outpatient visits in health centers, 2011



Source: National HMIS Database, 2011

Table 14: Top ten causes of morbidity in health centers, 2011

Diseases	Children <5 years	Patients ≥ 5 years	Total Cases	% of All Cases in 2011
ARIs	789,455	1,830,306	2,619,761	36%
Intestinal Parasites	135,031	503,358	638,389	9%
Bone and Joint Diseases	1,889	543,462	545,351	8%
Physical Trauma	29,707	356,888	386,595	5%
Gastritis	1,824	382,850	384,674	5%
Teeth and Gum Diseases	33,902	270,882	304,784	4%
Skin Diseases	71,597	185,373	256,970	4%
Diarrhea	134,537	113,352	247,889	3%
Pneumonia	136,003	88,257	224,260	3%
Malaria	43,323	16,7624	210,947	3%
Other Diseases	146,859	1,246,390	1,393,249	19%
Total	1,377,268	4,442,352	7,212,869	100%

Source: National HMIS Database, 2011

District Hospitals' Outpatient Morbidity

In 2011, the main causes of all outpatient visits in district hospitals were teeth and gum diseases (15%), allergic conjunctivitis (7%), eye diseases (5%), and gastro-intestinal disorders (4%). The five leading causes of

outpatient visits for children under five in district hospitals were allergic conjunctivitis, ARIs, teeth and gum diseases, skin diseases, and pneumonia (see Table 15).

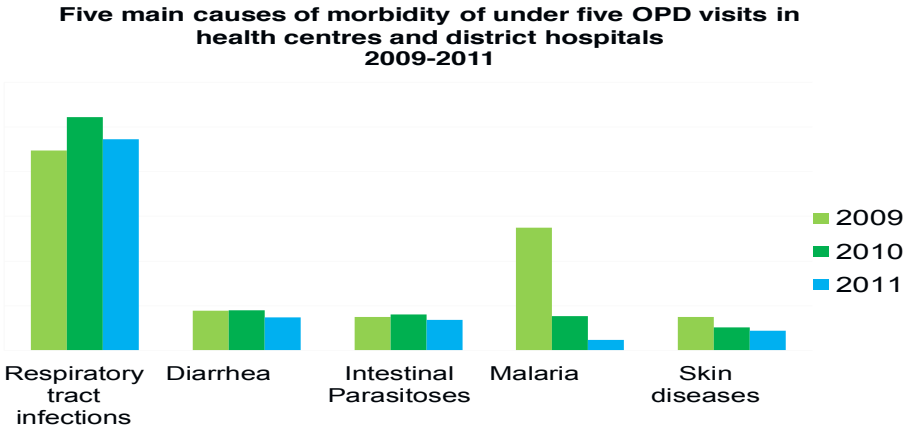
Table 15: Top ten causes of morbidity in district hospitals, 2011

Diseases	Children < 5	Patients ≥ 5 years	Total Cases	Percentage of All Cases
Teeth and Gum Diseases	3,642	79,904	83,546	15%
Allergic Conjunctivitis	5,769	34,357	40,126	7%
Eye Diseases	2,066	26,185	28,251	5%
Gastro-intestinal Disorders	0	20,230	20,230	4%
ARIs	5,716	11,293	17,009	3%
Skin Diseases	2,345	13,864	16,209	3%
Gynecological and Obstetric Diseases	80	15,704	15,784	3%
Physical Trauma	1,327	14,194	15,521	3%
Urinary Tract Diseases	759	14,633	15,392	3%
Epilepsy	1,033	13,083	14,116	3%
Other Diagnoses	45,940	232,786	278,726	51%
Total	68,677	476,233	544,910	100%

Source: National HMIS Database, 2011

Figure 4 shows the trend for five main causes of outpatient visits in health centers among children under five. From 2009 to 2011, there was a slight decrease in respiratory tract infections, diarrhea, intestinal parasites, malaria, and skin diseases.

Figure 4: Five main causes of outpatient visits in health centers among children under five, 2009 - 2011



Source: National HMIS Database, 2011

Hospitalization and Mortality

Admissions and Mortality in Health Centers and District Hospitals

Data on mortality in this report comes exclusively from health facility reports in the HMIS. They do not include deaths in the community that were not registered at a health facility. As a result, the mortality figures are most likely underestimates of Rwanda's true mortality rate.

The total number of admissions in health centers and district hospitals increased by 12%, from 419,117 in 2010 to 509,023 in 2011 (see Table 16). Thirteen percent of all admission in 2011 were children under five versus sixteen percent (17%) in 2010. Roughly two-thirds (78%) of all patients in 2011 were female (note that deliveries are included in admissions). The decrease in children under five admissions may be due to community home based care, which helps to treat sick children before their cases become severe and they require admission to health facilities.

Table 16: Number of admissions in health facilities by sex, 2011

	2010				2011			
Sex	<5 years	>=5 years	Total	%	<5 years	>=5 years	Total	%
Females	34,584	297,636	332,220	73%	30,808	366,435	397,243	78%
Males	40,877	83,244	124,121	27%	36,306	75,474	111,780	22%
Total	75,461	380,880	456,341	100%	67,114	441,909	509,023	100%

Source: National HMIS Database, 2010 and 2011

The total number of reported patient deaths in health facilities was 8,319 in 2011 (see Table 17). This represents an increase of 9% from 2010 (7,602), which is easily explained by the increase in number of patients hospitalized, as was shown in Table 16. Excluding data from referral hospitals, where the total number of admissions was not reported, Rwanda's health facility death rate was 1.2% in 2011, which is down from 1.6% in 2010. The number of deaths decreased in health centers by 10%, from 341 in 2010 to 307 in 2011. This reduction may be attributed to the availability of ambulances that facilitate referral and transport of complicated cases to district hospitals. In 2011, the majority of deaths occurred in district hospitals (72%) followed by referral hospitals (24%), and health centers (4%). This is, of course, an underestimate of overall mortality rates because it does not include deaths at the community-level or in the private sector.

Table 17: Number of deaths in health facilities, 2010 - 2011

Deaths	2010	2011	% of change
Health Centers	341	307	-10%
District Hospitals	5,206	6,000	15%
Referral Hospitals	2,055	2,012	-2%
Total	7,602	8,319	9%

Source: National HMIS Database, 2010 and 2011,

Leading Causes of Mortality in Health Centers and District Hospitals

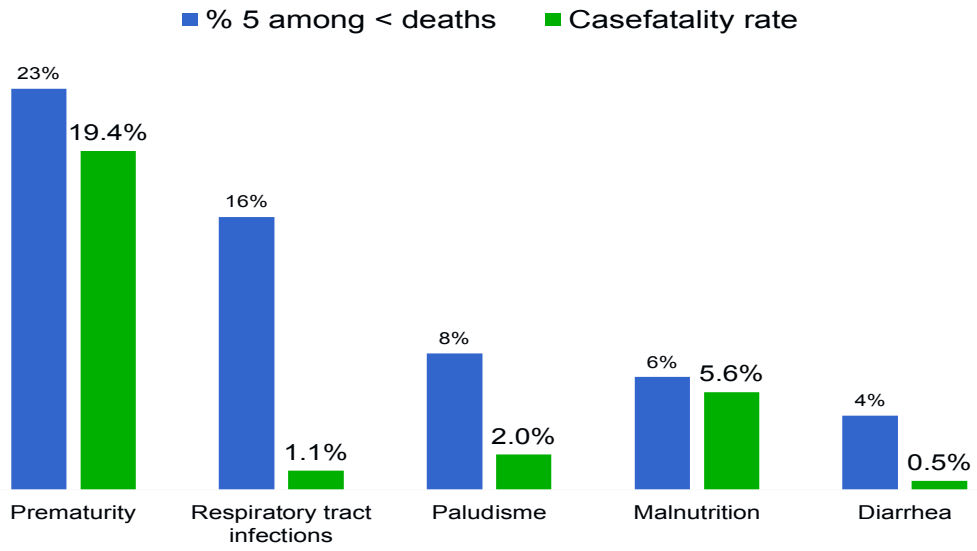
As shown in Table 18, the leading cause of death in district hospitals and health centers in 2011 was premature birth (11%). Malaria accounted for 6% of total deaths in 2011 as compared to 13% in 2010. The other major causes of deaths were ARIs (9%), cardiac diseases (9%) and HIV and opportunist infections (7%). Premature birth and respiratory tract infections represent more than one third (39%) of under five deaths (see Figure 5). The case fatality rate is higher for premature birth (19.4%).

Table 18: Top ten causes of deaths in district hospitals and health centers, 2011

Maladies	Number of death in 2011	% in 2011
Premature birth	695	11%
ARI	559	9%
Cardiac Diseases	554	9%
HIV and opportunistic infections	431	7%
Malaria	392	6%
Tuberculosis	232	4%
Malignant Tumors	207	3%
Physical Injuries	186	3%
Gastro-duodenal Diseases	157	2%
Others Causes	2,873	46%
Total	6,307	100%

Source: National HMIS Database, 2011

Figure 5: Proportional mortality and case fatality rates among children under five admitted to district hospitals and health centers, 2011



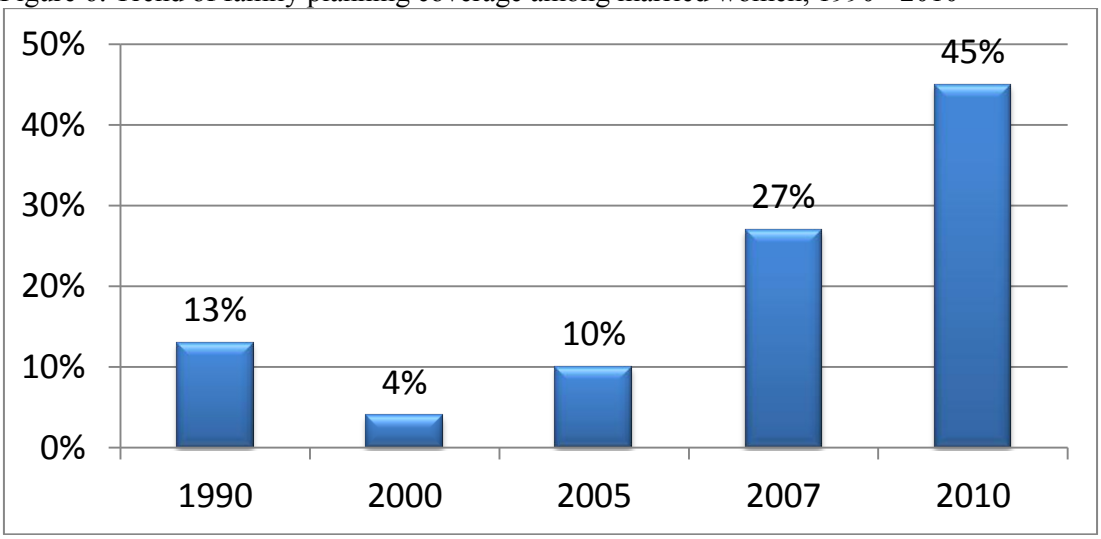
Source: National HMIS Database, 2011

Maternal and Child Health

Family Planning

Figure 6 shows the trend in modern family planning coverage for married women, from 1990 to 2010. Family planning coverage has increased substantially from 10% in 2005 to 45% in 2010.

Figure 6: Trend of family planning coverage among married women, 1990 - 2010

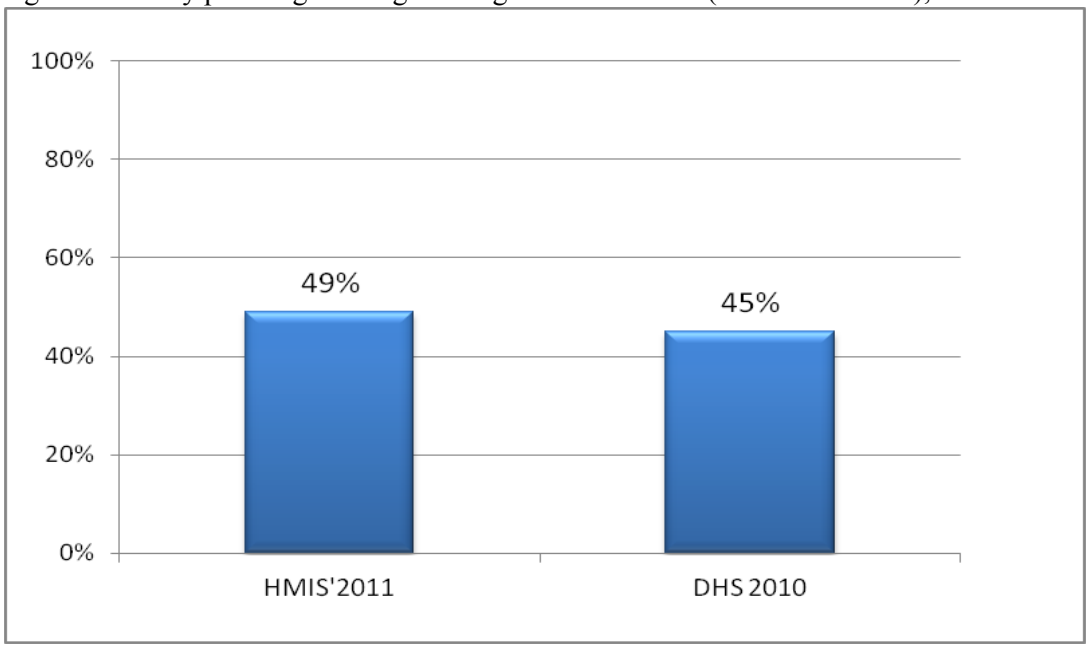


Source: DHS, 2005 2010

Routine family planning data are reported from both health centers and district hospitals. At the end of 2011,788,491 (49%) women of reproductive age were reported as continuing users of contraceptive methods in health centers and districts hospitals (see Figure 7). This represents a coverage rate of 31% for women of reproductive age and 49% for married women (see Figure 8), assuming that 49% of women of reproductive age are married and 76% of family planning users are married women.

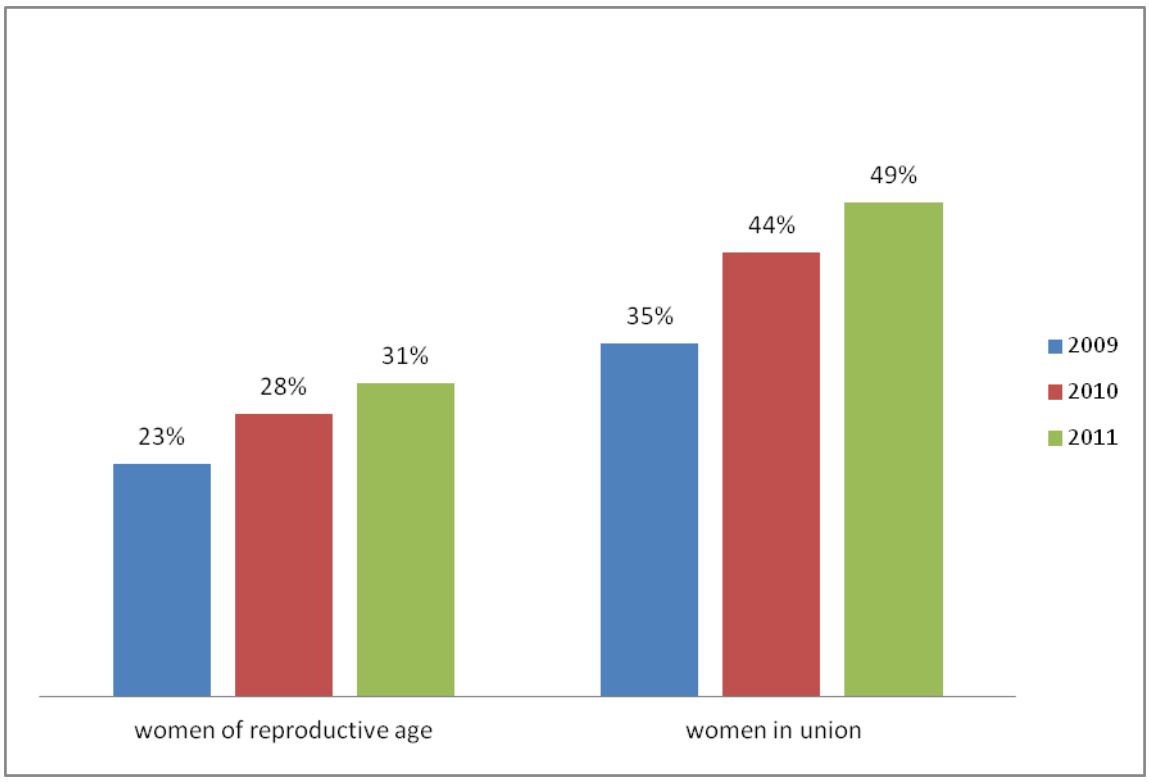
Overall, family planning coverage in Rwanda met the EDPRS target of 50%. This is also very close to the population-based contraceptive prevalence rate provided by the DHS in 2010.

Figure 7: Family planning coverage among married women (modern methods), 2010 - 2011



Sources: National HMIS Database, 2011; DHS, 2010

Figure 8: Family planning coverage (modern methods), 2009 - 2011



Sources: National HMIS Database, 2011; DHS, 2010

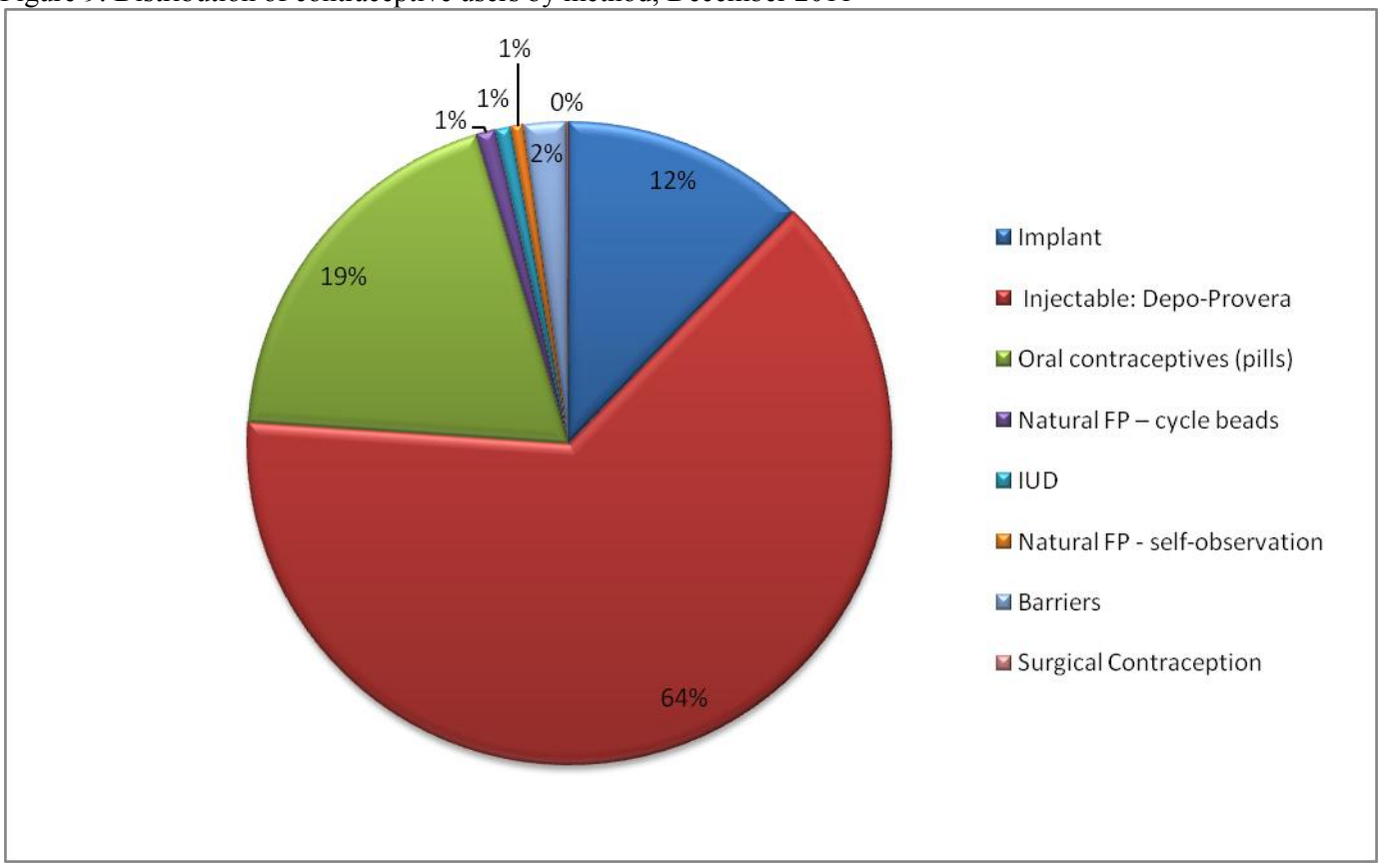
Table 19 and Figure 9 shows that the most used method of contraception in Rwanda is Depo-Provera (64%), followed by oral contraception (19%), and implant (12%). Surgical methods (0.1%) and intrauterine devices (IUDs) (1%) are not commonly used, probably because they can only be administered by qualified personnel who would also need to be trained to do so.

Table 19: Family planning users by method and units distributed, 2011

Method	Continuing Users, December, 2011	New Users, 2011
Implant	96,378	20,045
Depo-Provera	503,288	209,626
Oral Contraceptives	152,091	75,707
Natural FP: Cycle Beads	7,747	2,809
Intrauterine device (IUD)	6,149	3,590
Natural FP: Self-observation	5,002	5,748
Barriers	16,769	11,032
Surgical Contraception	1,067	578
Total	**788,491**	**329,135**

Source: National HMIS Database, 2011

Figure 9: Distribution of contraceptive users by method, December 2011

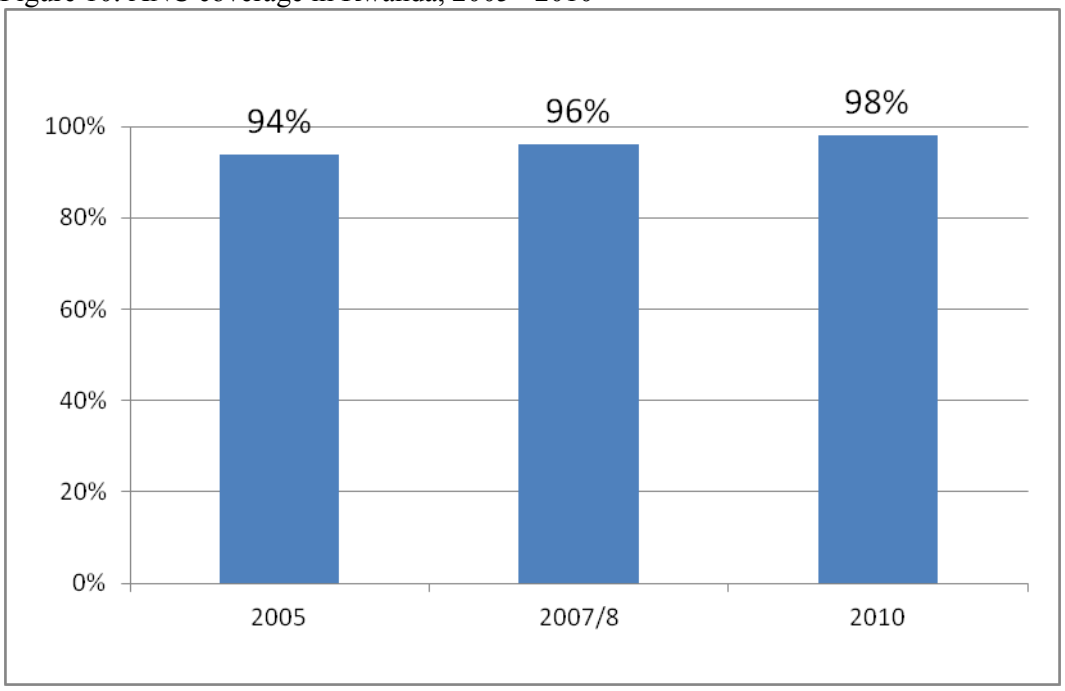


Source: National HMIS Database, 2011

Ante-natal Care (ANC)

Figure 10 shows that, in Rwanda, almost all pregnant women attend ANC appointments at least once in their pregnancies (98%).

Figure 10: ANC coverage in Rwanda, 2005 - 2010



Sources: DHS, 2005-2010

Data from the HMIS indicate that a total of 336,090 pregnant women registered for ANC in 2011 (see Table 20). This represents an increase of 4.6% in ANC visits from 321,388 in 2010, however these reported registrations only

represent 80% of the expected pregnancies in 2011 compare to 98% from 2010 DHS. This may be due to under-reporting as a significant proportion of ANC have been provided through national referral hospitals or private health facilities, which do not report through the HMIS. It could also be due to an inaccurate projection of expected pregnancies (4.1% of total population), which does not take into consideration the rapid adoption of family planning services.

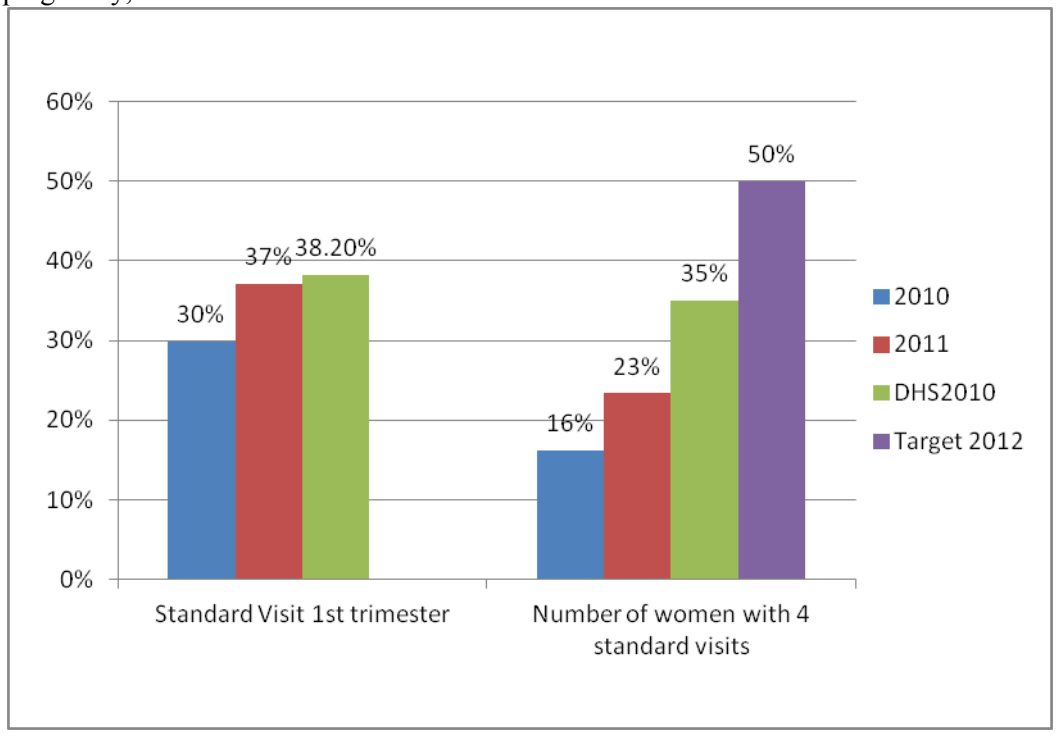
The percentage of newly registered pregnant women attending four, standard ANC visits increased from 15% in 2010 to 23% in 2011. Of the women who registered, a higher proportion had at least one standard visit (an increase from 25% in 2010 to 30% in 2011), and the percentage who had four standard visits increased from 14% in 2010 to 16% in 2011. The percentage of high risk pregnancies also increased slightly from in 2010 (28%) to 2011 (32%). In light of the EDPRS target of 50%, more effort should be put in to increase the number of pregnant women attending four standard ANC appointments.

Table 20: Pregnant women registered for ANC, 2010 - 2011

	2010		2011	
Description	**Total**	**% to New Registrations**	**Total**	**% of to New Registrations**
New Women Registering for ANC	322,085		350,074	
Women Attending First Trimester Standard ANC Visit	96,244	30%	130,192	37%
Women Attending Four Standard ANC Visits	52,308	16%	81,234	23%
High-risk Pregnancies Screened	47,503	15%	47,267	13%
High-risk Pregnancies Referred to High-Risk Pregnancies Screened	13,461	28%	14,906	32%
ANC tetanus toxoid **vaccine (VAT2-5) Immunizations Given**	232,399	72%	259,402	74%

Sources: National HMIS Database, 2010 and 2011; DHS, 2010

Figure 11: Percentage of newly registered women attending four ANC visits in their first trimester of pregnancy, 2011



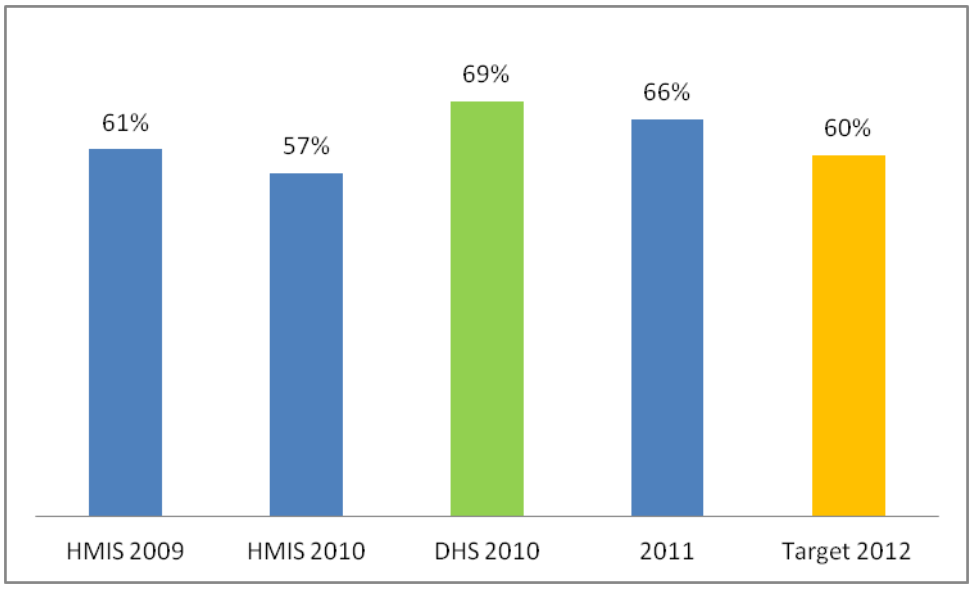
Sources: National HMIS Database, 2010 and 2011; DHS, 2010

Assisted Deliveries

Rwanda's maternal health policy promotes delivery in health facilities where the delivery is conducted by a trained health professional in order to reduce any complications that may arise during childbirth. In 2011, health facilities reported a total of 280,932 assisted deliveries, of which the vast majority were normal deliveries (84%) and more than two thirds (67%) were in health centers. In 2011, HMIS data showed Rwanda's assisted delivery rate at approximately 64%, which was slightly less than the DHS 2010 estimate of 69% (see Figure 12). This is likely due to under-reporting and denominator issues.

The proportion of assisted deliveries to new ANC registrations increased from 75.6% in 2010 to 83.6% in 2011. The 2010 DHS shows that 69% of pregnant women delivered at health facilities (see Table 21). In 2011,the majority (88.8%) of maternal death occurred either in district hospital or in a referral hospital.

Figure 12: Assisted deliveries, 2009 - 2011



Sources: National HMIS Database, 2010-2011; DHS, 2010

Figure 13: Assisted deliveries for women newly registered for ANC, by district, 2011

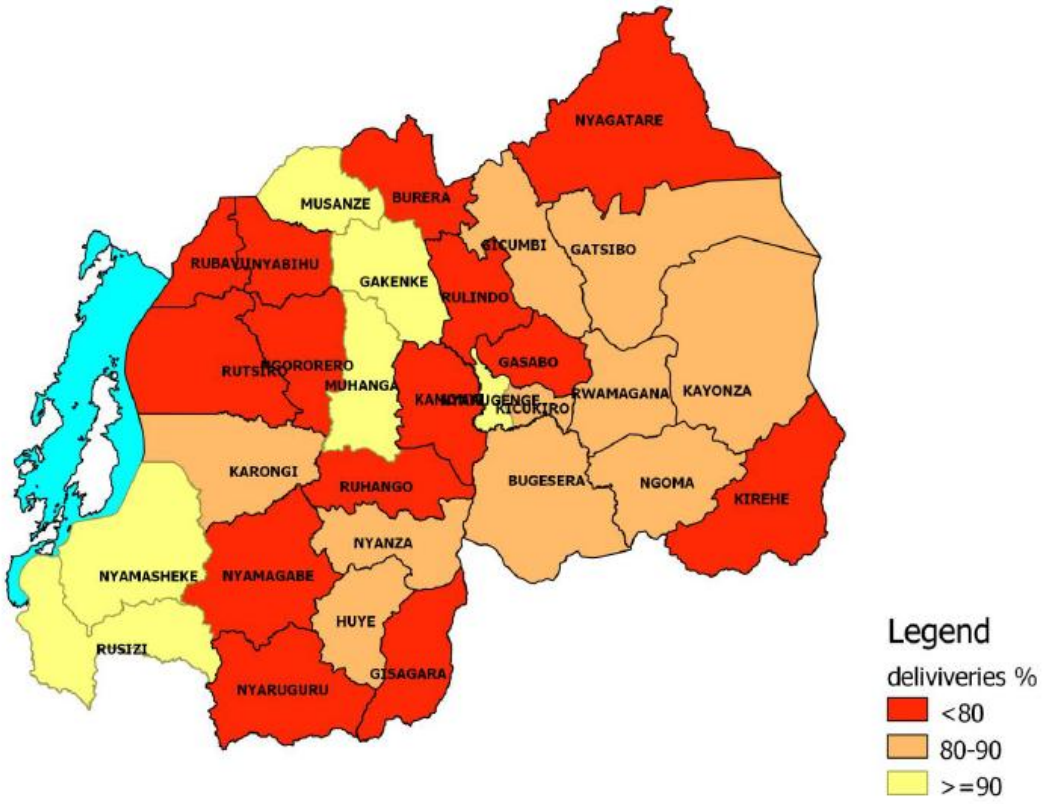


Table 21: Location of assisted deliveries, 2010 - 2011

	2010				2011			
Location of delivery	Normal deliveries	Dystocic	Total	Maternal Deaths	Normal deliveries	Dystocic	Total	Maternal Deaths
Health Centers	164,236	1,305	165,541	17	187,648	1,255	189,174	27
District Hospitals	43,489	28,377	73,670	162	46,550	41,784	88,334	146
Referral Hospitals	1,960	1,875	3,835	42	1,781	1,643	3,424	69
Total	209,685	31,557	243,046	221	235,841	44,682	280,932	242

Source: National HMIS Database 2010 and 2011; KFH, CHUK, CHUB

Cesarean Sections at Hospitals

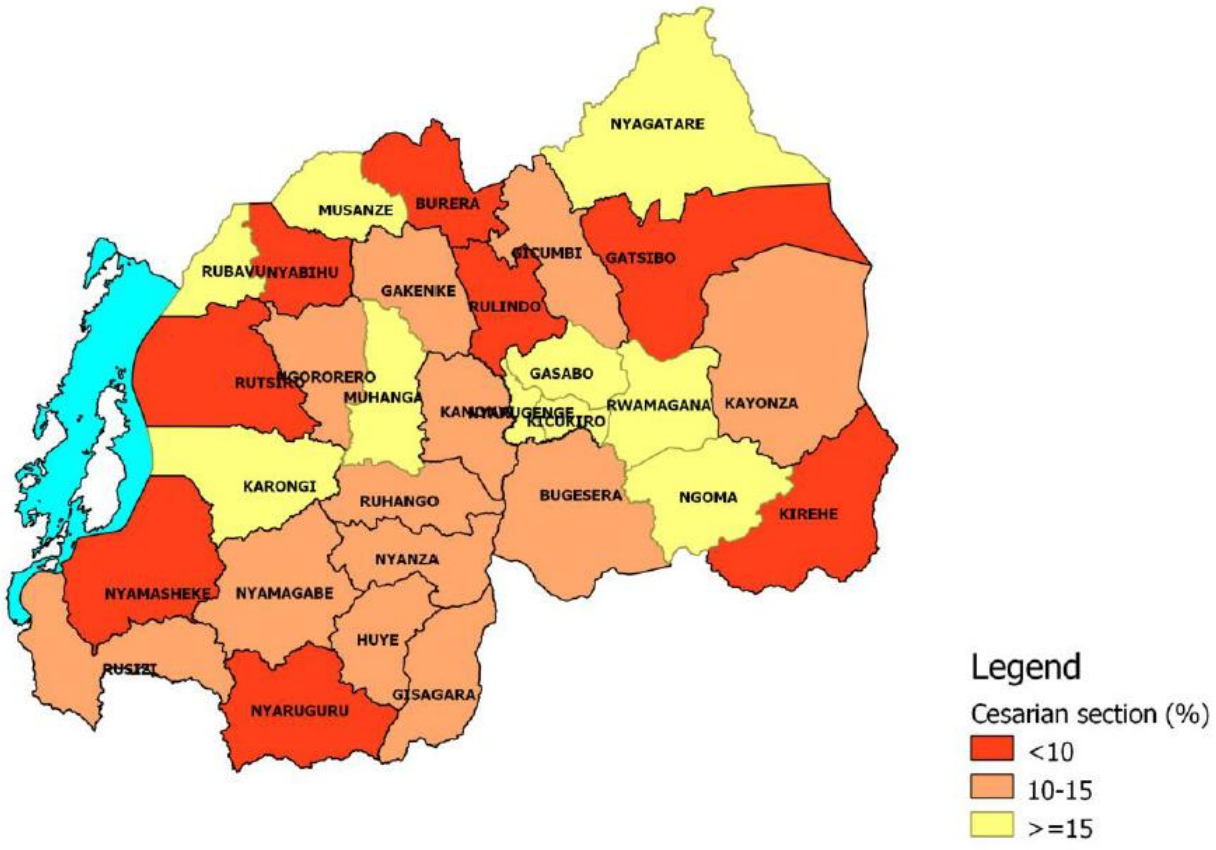
The percentage of cesarean sections among all deliveries is 15%(see Figure 14). Among hospital deliveries cesarean sections increased from 36% in 2010 to 45.3% in 2011 (see Table 22), which can explain the decrease in maternal and child mortality. Overall, the increased number of caesarian section may be partly due to the increased availability of ambulances and better referral of high risk pregnancies.

Table 22: Caesarian sections in district hospitals and referral hospitals, 2010 - 2011

	2010				2011			
Health Facility Type	Deliveries	Dystocic deliveries	Cesarean sections	Cesarean Sections as % of Total Deliveries	Deliveries	Dystocic deliveries	Cesarean section	Cesarean Sections as % of Total Deliveries
District Hospital	73,670	28,377	26,330	35.70%	88,334	41,784	40,037	45%
Referral Hospital	3,835	1,875	1,701	44.30%	4752	1,643	2123	44.7%
Total	77,505	30,252	28,031	36.20%	93,086	43,427	42,160	45.30%

Sources: National HMIS Database 2010 and 2011; reports from referral hospitals

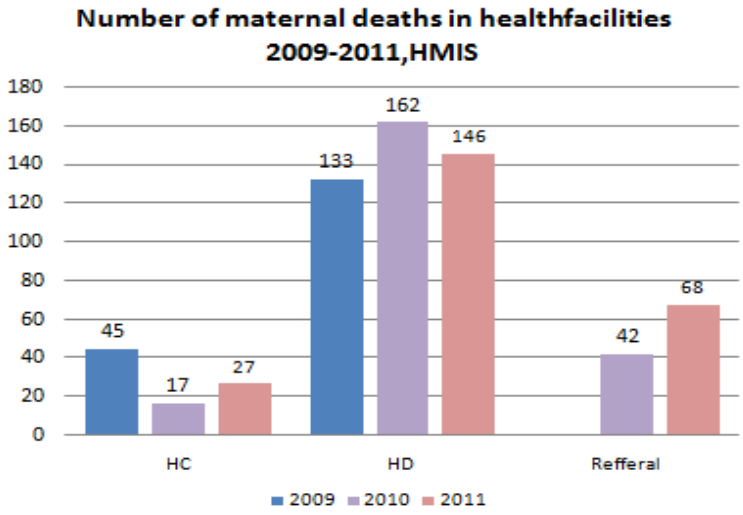
Figure 14: Percentage of cesarean section among health facility deliveries, by district, 2011



Maternal Death

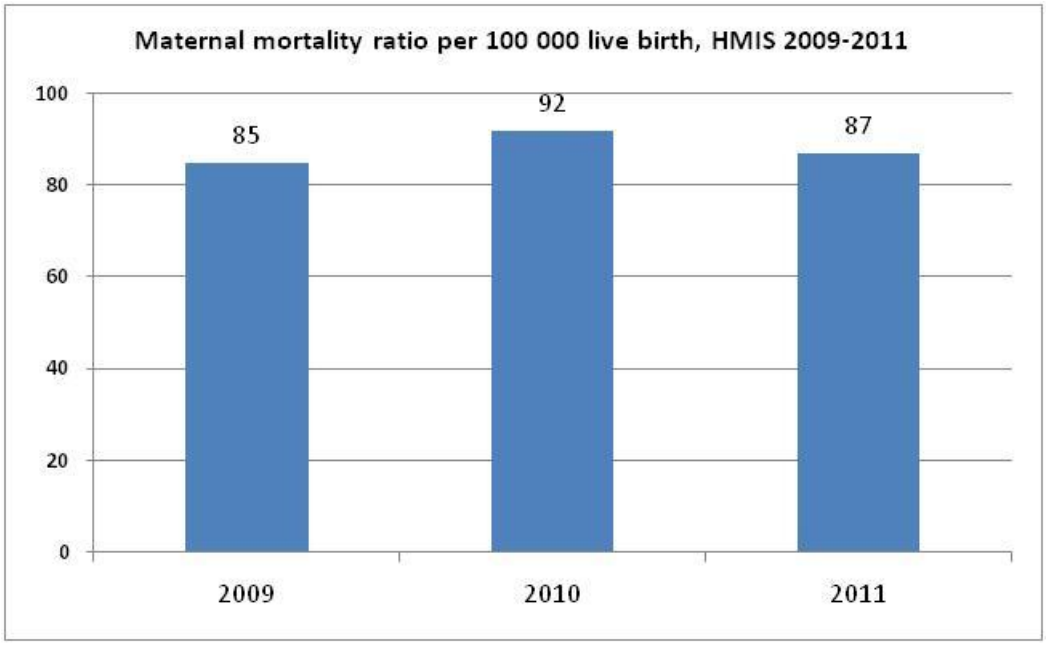
HMIS data shows that the proportion of maternal deaths decreased from 92 per 100,000 live births in 2010 to 87 per 100,000 live birth in 2011 (see Figure 16). This data do not include maternal death in the community, which can explain why the 2010 DHS' maternal mortality ratio (MMR) was significantly higher at 487 per 100,000 live births. From 2009 to 2012, we observe a decrease in number of maternal death at health center, a slight increase of number of maternal death in district hospital and referral hospital (see figure 15), this can be due to a better system of reference and consequently the decrease of maternal death.

Figure 15: Maternal deaths in health facilities, 2009 - 2011



Sources: National HMIS Database 2010 and 2011; reports from referral hospitals

Figure 16: Maternal mortality ratio per 100,000 live births, 2009 - 2011



Source: National HMIS Database 2010 and 2011; reports from referral hospitals

Table 23: Causes of maternal death, 2010

Causes of death	Number maternal death	%
Severe bleeding	75	33.9%
Malaria	18	8.14%
Septicemia	27	12.21%
Eclampsia	14	6.33%
Other Infections	7	3.16%
Unknown Causes	12	5.42%
Obstructive Labor	10	4.52%
Other Causes	13	5.88%
Anesthesia Complications	11	4.97%
Opportunistic Infections/HIV	9	4.07%
Amniotic Embolism	10	4.52%
Heart Failure	7	3.16%
Pulmonary Embolism	3	1.35%
Anemia in Pregnancy	5	2.26%
Total	**221**	**100%**

Source: Maternal Death Audit, MCH/MOH, 2010

Among all deliveries, the major causes of maternal mortality in 2011 were severe bleeding (33.9%), septicemia (12.21%), and malaria (8.14%) (see Table 23).

Weight at Birth and Deaths of Newborns

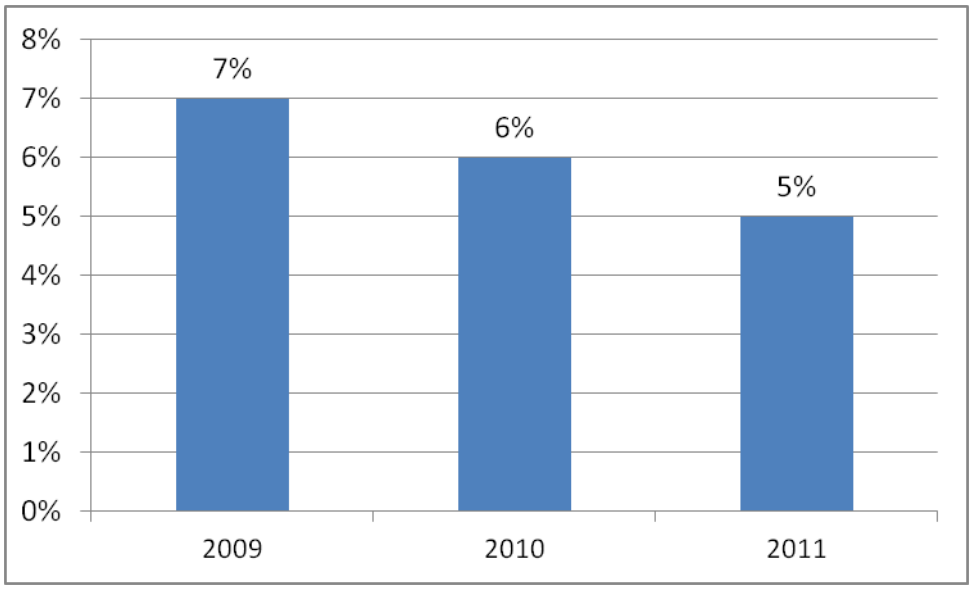
Table24 shows the number of births, peri-natal deaths, and low birth weight babies born at health facilities in Rwanda in 2010 and 2011. The proportion of peri-natal deaths decreased from 44.5 per 1,000 births in 2010 to 42.1 per 1,000 births in 2011. Low birth weight deliveries decreased from 12.3% in 2010 to 7.9% in 2011 at district hospitals and from 3.2% in 2010 to 2.9% in 2011 at health centers. These positive trends reflect the overall decrease in low birth weight babies, from 6% in 2010 to 4.7% in 2011 (see Figure 17).

Table 24: Births and peri-natal deaths in health centers and district hospitals, 2010 - 2011

	2010				2011			
Facility Type	Total Births	Total Deaths	Births < 2.5 kg	% Low Birth Weight	Total Births	Total Deaths	Births < 2.5 kg	% low Birth Weight
Health Centers	166,151	1,246	5,339	3.2%	190,077	1,500	5,419	2.9%
District Hospitals	75,126	3,345	9,233	12.3%	90,244	3,802	7,169	7.9%
Referral Hospital					4750	283	744	15.7%
Total	241,277	4,591	14,572	6.0%	285,071	5,585	13,332	4.7%

Sources: National HMIS Database, 2010 and 2011; reports from referral hospitals

Figure 17: Proportion of low birth weight babies among assisted deliveries in health centers and districts hospitals, 2009 - 2011



Sources: National HMIS Database, 2010 and 2011

Child Immunizations and ANC Anti-tetanus Immunization

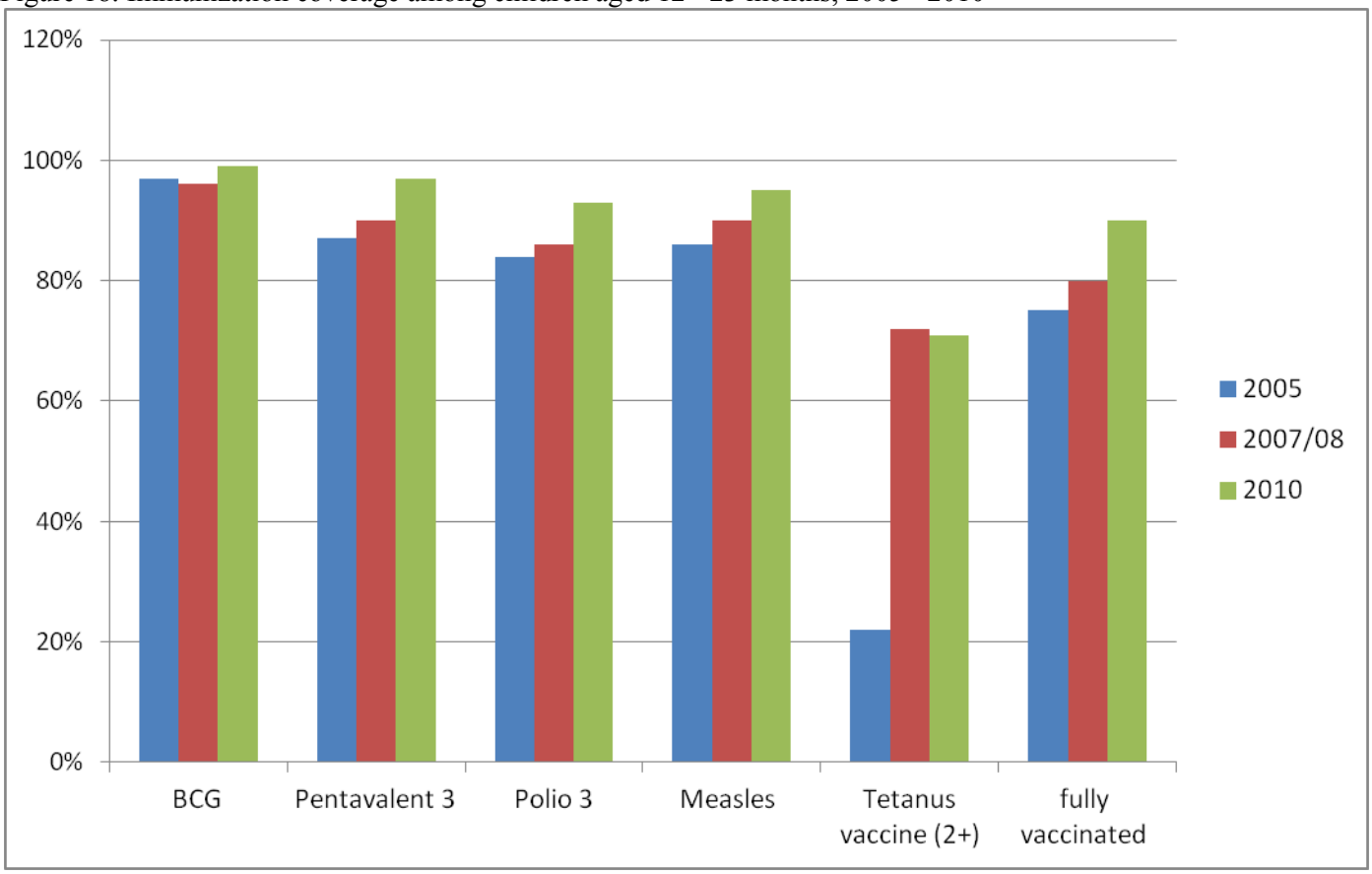
Based on routinely reported data from health facilities, immunization coverage increased for all antigens from 2010 to 2011, except for the measles vaccination (see Table 25). However, coverage rates reflected in routine data are significantly below coverage rates from the DHS, 2010 (see Figure 18). This is probably due to the HMIS' overestimation of the denominator (i.e., children under one as 4.1% of the total population) and the increasing number of childhood immunizations being delivered through private clinics and dispensaries that do not report to the HMIS.

Table 25: Childhood vaccination and insecticide treated net (ITN) distribution, 2010 - 2011

	2010		2011	
Indicator	**Number**	**% Coverage**	**Number**	**% Coverage**
Polio O	255,580	60%	301,114	69%
Bacille Calmette Guerin vaccination (BCG)	301,065	71%	338,552	77%
Polio 1-DTP-HepB/Hib1	300,088	70%	328,124	75%
Polio 2-DTP-HepB/Hib2	297,678	70%	323,076	74%
Polio 3-DTP-HepB/Hib3	301,503	71%	317,596	72%
Measles	310,725	73%	296,108	67%
Children who received ITNs	163,963		58,852	

Source: National EPI Database, 2010 and 2011

Figure 18: Immunization coverage among children aged 12 - 23 months, 2005 - 2010

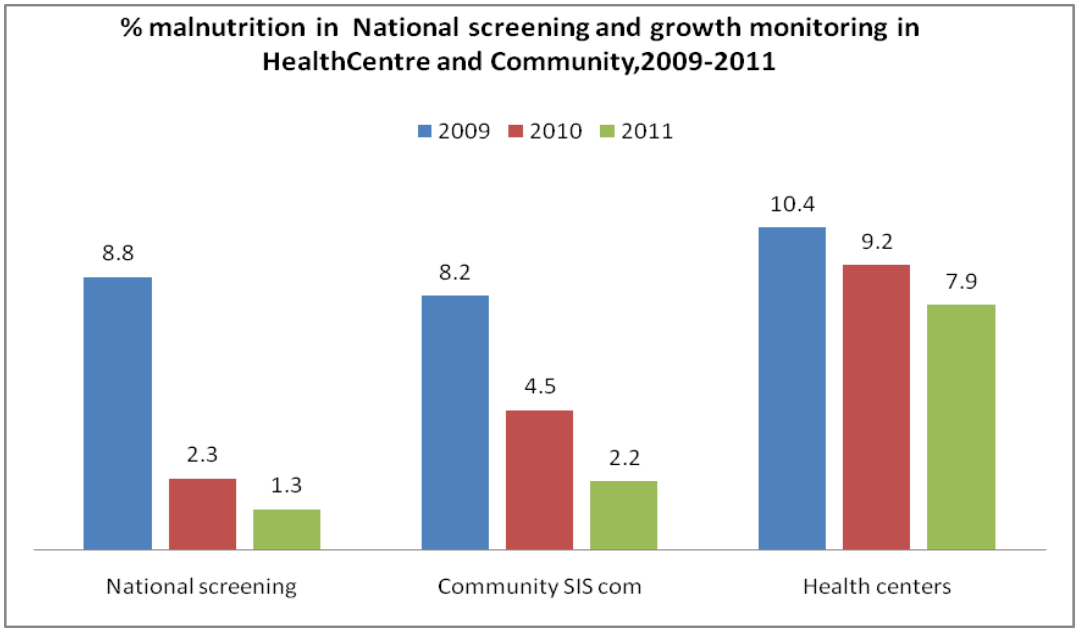


Sources: Demographic Health Surveys, 2005, 2007, 2008, 2010

Growth Monitoring

In December 2011, a national screening for acute malnutrition was conducted country wide and 1,217,935 children aged 6-59 months were screened. Results showed an acute malnutrition rate of 1.3%. Children under five are routinely monitored for malnutrition at health facilities and the community level. Results from routine monitoring are quite different from the national screening results, but all show a decrease in acute malnutrition from 2009 to 2011 (see Figure 19).

Figure 19: Acute malnutrition rate in children under five,2009 - 2011



Sources: National screening; Community Health Workers' Database (SIScom); National HMIS Database, 2009-2011

Hospitalization for Childhood Malnutrition

The number of people hospitalized for malnutrition did not vary a lot between 2010 and 2011. In 2011 2,010 people were hospitalized for malnutrition and, in 2010, 2,136 people were hospitalized for malnutrition (see Table 26). In 2011, children under five represented 75% of those hospitalized for malnutrition and 88% of those who recovered. The proportion of old cases was 35%.

Table 26: Hospitalization for childhood malnutrition and health outcomes, 2010 - 2011

		Registrations		Status			
Year	Age group	New Cases	Old Cases	Recovered	Referred to Hospital	Lost to Follow Up	Died
2010	< 5 years	949	887	1,058	55	45	5
	>=5 years	209	91	211	20	14	0
	Total	**1,158**	**978**	**1,269**	**75**	**59**	**5**
2011	< 5 years	977	556	907	60	83	3
	>=5 years	327	160	300	13	4	1
	Total	**1,304**	**716**	**1,207**	**73**	**87**	**4**

Source: National HMIS Database, 2010 and 2011

Outpatient Treatment of Malnutrition

The number of people who received outpatient treatment for malnutrition was 60,239 in 2011, of which 50% were old cases (see Table 27). The proportion of those lost to follow up decreased from 15% in 2010 to 12% in 2012. Among all discharged patients, 87% recovered in 2011, as compared to 83% in 2010. Deaths among patients treated for malnutrition as outpatients were also down slightly, especially among patients over five.

Table 27: Outpatient treatment for childhood malnutrition and health outcomes, 2010 - 2011

		Registrations		Status			
Year	**Age group**	**New Cases**	**Old Cases**	**Recovered**	**Referred to Hospital**	**Lost to Follow Up**	**Died**
2010	< 5 years	30,945	24,079	26,645	362	5,009	139
	>=5 years	6,644	2,915	5,224	92	644	27
	Total	**37,589**	**26,994**	**31,869**	**454**	**5,653**	**166**
2011	< 5 years	22,929	25,697	27,886	356	3,914	111
	>=5 years	6,319	5,294	6,284	67	760	22
	Total	**29,248**	**30,991**	**34,170**	**423**	**4,674**	**133**

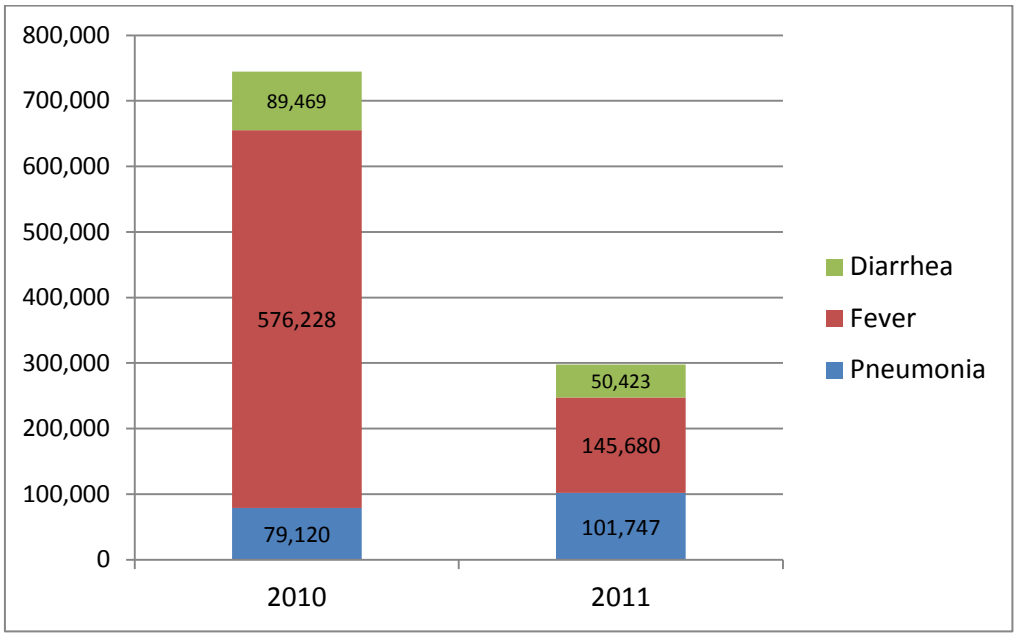
Source: National HMIS Database, 2010 and 2011

Community Health Worker (CHW) Program

Community-based Integrated Management of Childhood Illnesses (C-IMCI)

During 2011, over 291,230 children were treated by CHWs, compared to 750,422 in 2010. This decrease was largely due to the decline in reported malaria cases. The change in reporting may be due to the new protocol for treatment of fever where malaria cases are only treated when a malaria test (rapid diagnostic test or blood smear) is positive, but it could also be due to reported stock out of coartem in certain areas of the country. As shown in Table 28, more than 95% of children treated for malaria recovered, 8.7% were referred to health facilities and less than 0.1% died. The percentage of those referred for treatment was 7.6%% in 2010 and 7.9% in 2011. Consequently, the percentage of deaths decreased from 0.023% in 2010 to 0.021% in 2011. Figure 20 show us that the majority of children were treated for fever (49%) and pneumonia (34%) in 2011

Figure 20: Children treated by CHWs as part of C-IMCI, 2010 - 2011



Source: SIScom, 2011

Table 28: Community-IMCI outcomes, 2010 - 2011

Year	Recovered	Referred	Died	Total	% Recovered	% Referred	% Died
2010	687,716	56,931	170	744,817	92.3%	7.6%	0.023%
2011	274,225	23,561	64	297,850	92.1%	7.9%	0.021%
Fever							
Year	**Recovered**	**Referred**	**Died**	**Total**	**% Recovered**	**% Referred**	**% Died**
2010	530,885	45,226	117	576,228	92.1%	7.8%	0.020%
2011	133,607	12,060	13	145,680	91.7%	8.3%	0.009%
Diarrhea							
Year	**Recovered**	**Referred**	**Died**	**Total**	**% Recovered**	**% Referred**	**% Died**
2010	82,948	6,490	31	89,469	92.7%	7.3%	0.035%
2011	45,322	5,085	16	50,423	89.9%	10.1%	0.032%
Pneumonia							
Year	**Recovered**	**Referred**	**Died**	**Total**	**% Recovered**	**% Referred**	**% Died**
2010	73,883	5,215	22	79,120	93.4%	6.6%	0.028%
2011	95,296	6,416	35	101,747	93.7%	6.3%	0.034%

Sexual Violence

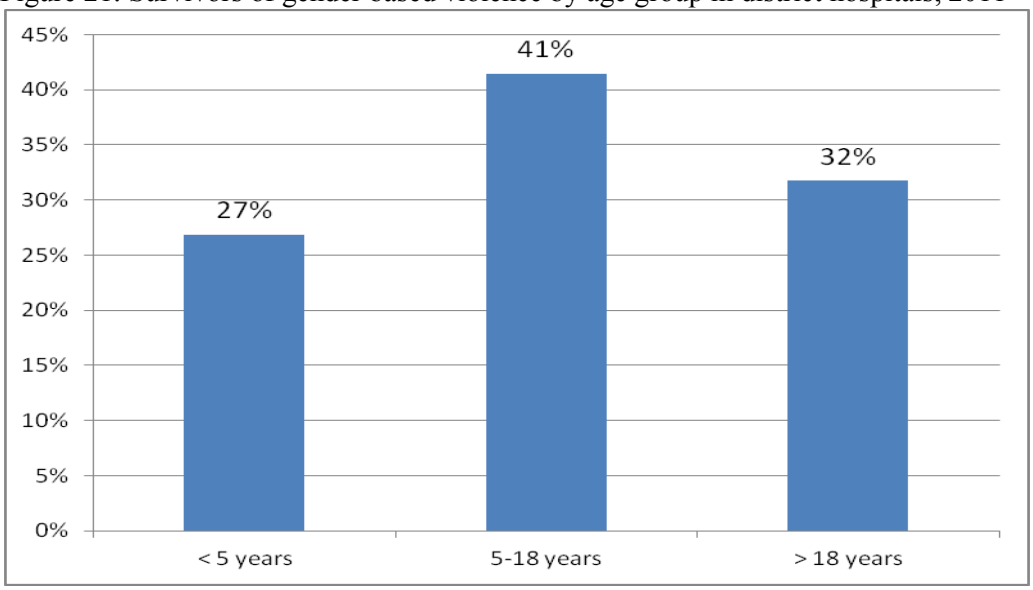
In 2011, 1,978 cases of reported gender based violence also had objective symptoms of sexual violence. Ninety-six percent of the cases investigated were among females (see Figure 22). As shown in Figure 21, the largest group of survivors was females between 5 and 18 years of age (41%). Most survivors among children under five were male (34%).

Table 29: Patients suspected of surviving sexual violence or with symptoms of surviving sexual violence, 2008 - 2011

	2008	2009	2010	2011
Suspicion of sexual violence	3,393	3,582	6,975	2,326
Symptoms of sexual violence	1,187	1,216	2,403	2,079

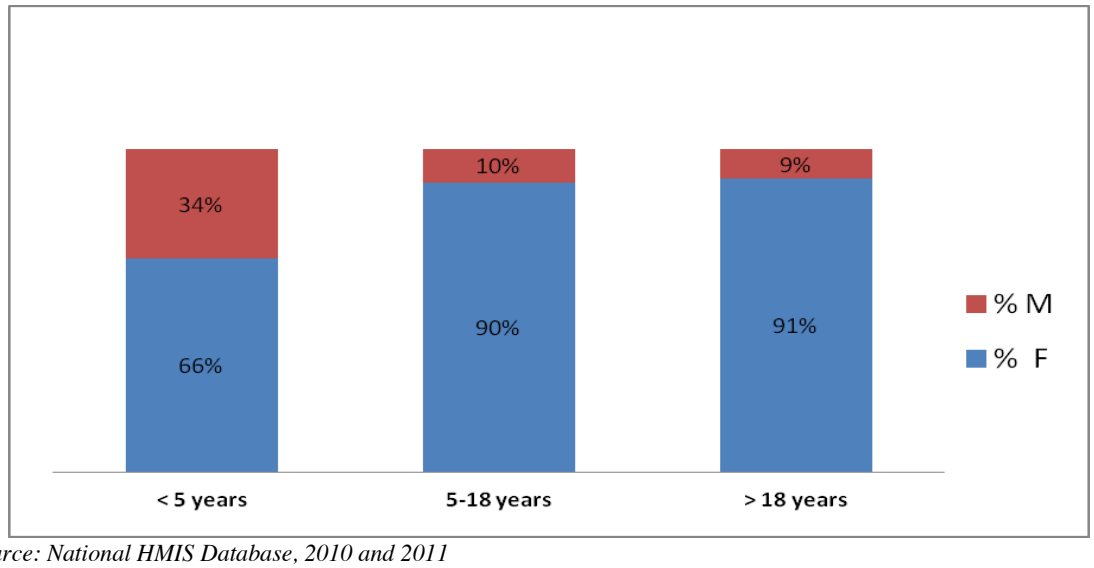
Source: National HMIS Database, 2010 and 2011

Figure 21: Survivors of gender based violence by age group in district hospitals, 2011



Source: National HMIS Database, 2010 and 2011

Figure 22: Gender based violence by age group and sex in district hospitals, 2011

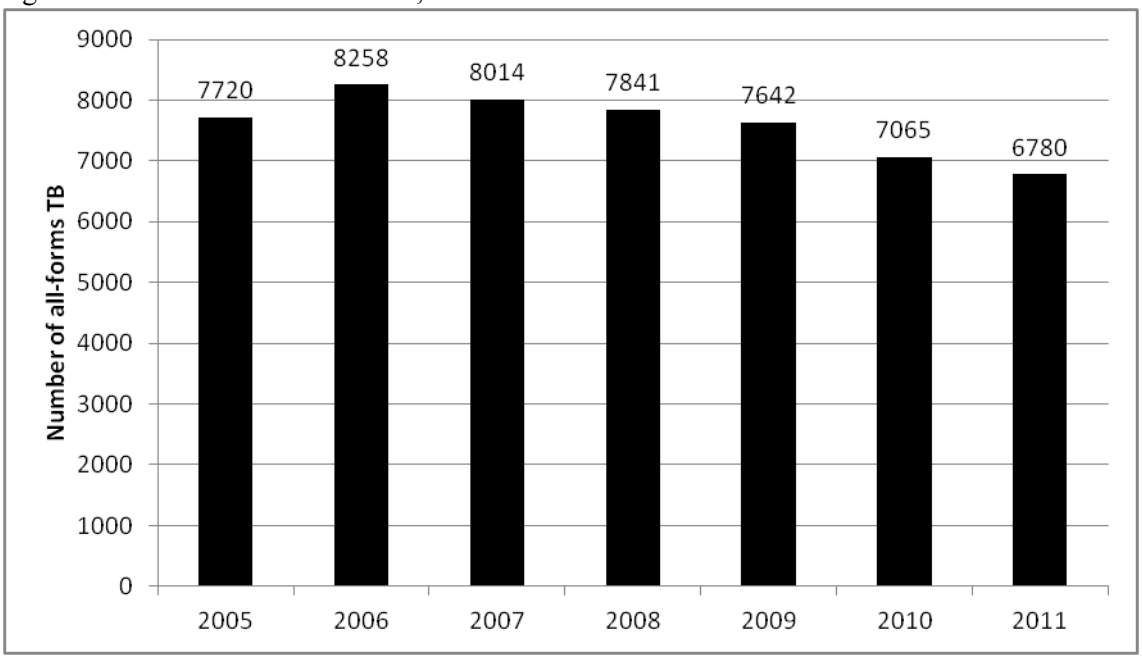


Source: National HMIS Database, 2010 and 2011

TB and HIV & AIDS

TB data are captured each quarter when a joint team from the central level (TB division) and the district level meet to validate data. Across the country, there are 194 TB diagnosis and treatment centers (CDTs) and 311 TB treatment centers (CTs) . Figure 23 shows the trend in TB case detection from 2005 to 2011. A slight decrease in TB case detection took place over these seven years.

Figure 23: TB case detection trends, 2005 - 2011



Source: TRAC Plus/TB Unit Report, 2009-2011

In 2011, 4,447 positive TB suspects were reported and 47% of these had been detected by CHWs (see Table 30). The proportion of positive TB suspects increased from 9.7% in 2010 to 25% in 2011. This shows a great improvement in TB cases detection by CHWs.

Table 30: CHWs participation in community DOTS, 2009 - 2011

Year	# of Districts	Population Covered	Suspected TB Cases		# of Positive Suspected TB Cases		% of Suspected TB Cases Detected by CHWs	% of Positive Suspected TB Cases Detected by CHWs
			Total	Detected by CHWs	Total	Detected by CHWs		
2009	**24**	**9,860,652**	**52,235**	**5,840**	**2,275**	**365**	**11.2%**	**13.2%**
2010	**30**	**10,412,820**	**70,325**	**6,850**	**4,049**	**396**	**10%**	**9.7%**
2011	**30**	**10,718, 378**	**175,091**	**82,978**	**4,447**	**1,126**	**47%**	**25%**

Source: TRAC Plus/TB Unit Report, 2009-2011

Table 31: TB case management, 2010 - 2011

Year	Total Registered Cases	New Cases of TB Sputum Smear Positive	Retreatment	% of Cases Re-treated
2010	7,065	3,785	442	6.3%
2011	6,780	3,811	414	6.1%

Source: TRAC Plus/TB Unit Report, 2010-2011

Overall, the TB treatment success rate increased from 85% in 2010 to 88% in 2011 (see Table 32). The TB treatment success rate in Rwanda met World Health Organization (WHO) norms of 85%. In 2010, there was a 91% success rate among TB patients treated by CHWs. Rwanda's community-based DOTS interventions covers 30 out of 30 districts.

Table 32: Patients treated and cured among CHWs' sputum smear positive cases, 2009 - 2010

Year	Success rate of Sputum Smear +			Overall Success rate	Success Rate of Patient Treatd by CHWs
	Total Treated	Cured	Completed Treatment		
2009	**4,096**	3,140 (78.7%)	335 (8.2%)	84.8%	97%
2010	**3,806**	3,039 (79.8%)	296 (7.7%)	87.6%	91%

Source: TB program annual report, 2011

Improving TB-HIV Integration and Management

TB-HIV integration in Rwanda has been very successful and, in 2011, 97.2% of all registered TB patients were tested for HIV (see Table 33). The overall prevalence of HIV among TB patients was 28.3% in 2011, ranging from 21% among new smear-positive cases and 38% among all other TB cases (see Table 34). In total, 96.8% of the TB-HIV patients received cotrimoxazole-preventive treatment (CPT).

These figures show that the majority of interventions included in Rwanda's TB/HIV policy have been successfully implemented, including systematic HIV counselling and testing of TB patients and suspects, systematic screening of PLHIV for active TB, delivery of care and treatment for TB patients with HIV through a one-stop service model, and scaling up of ART nationwide. By the end of 2011, 179 out of 194 CDTs had a functional one-stop TB-HIV service.

Table 33: HIV testing of TB patients, 2010 - 2011

Year	Total TB Patients	TB Patients Tested for HIV	TB Patients who Test Positive for HIV	HIV Positive TB Patients on Cotrimoxazole
2010	7,065	6,914 (97.9%)	2,198(31.8%)	2,137 (97.2%)
2011	6,780	6,560 (96.8%)	1,855 (28.3%)	1,794 (96.7%)

Source: TB program annual report, 2011

Table 34: Detection of HIV and use of CPT among all TB patients registered in 2011

	Registered	Tested	HIV+	CPT	% Tested	% HIV+	% Cotrimoxazole (CTX)
New pulmonary TB (NTPM+)	3,811	3,747	794	775	98.3%	21.2%	97.6%
All other Cases	2,940	2,816	1,061	1,020	95.8%	37.7%	96.1%
Total Cases	6,751	6,563	1,855	1,795	97.2%	28.3%	96.8%

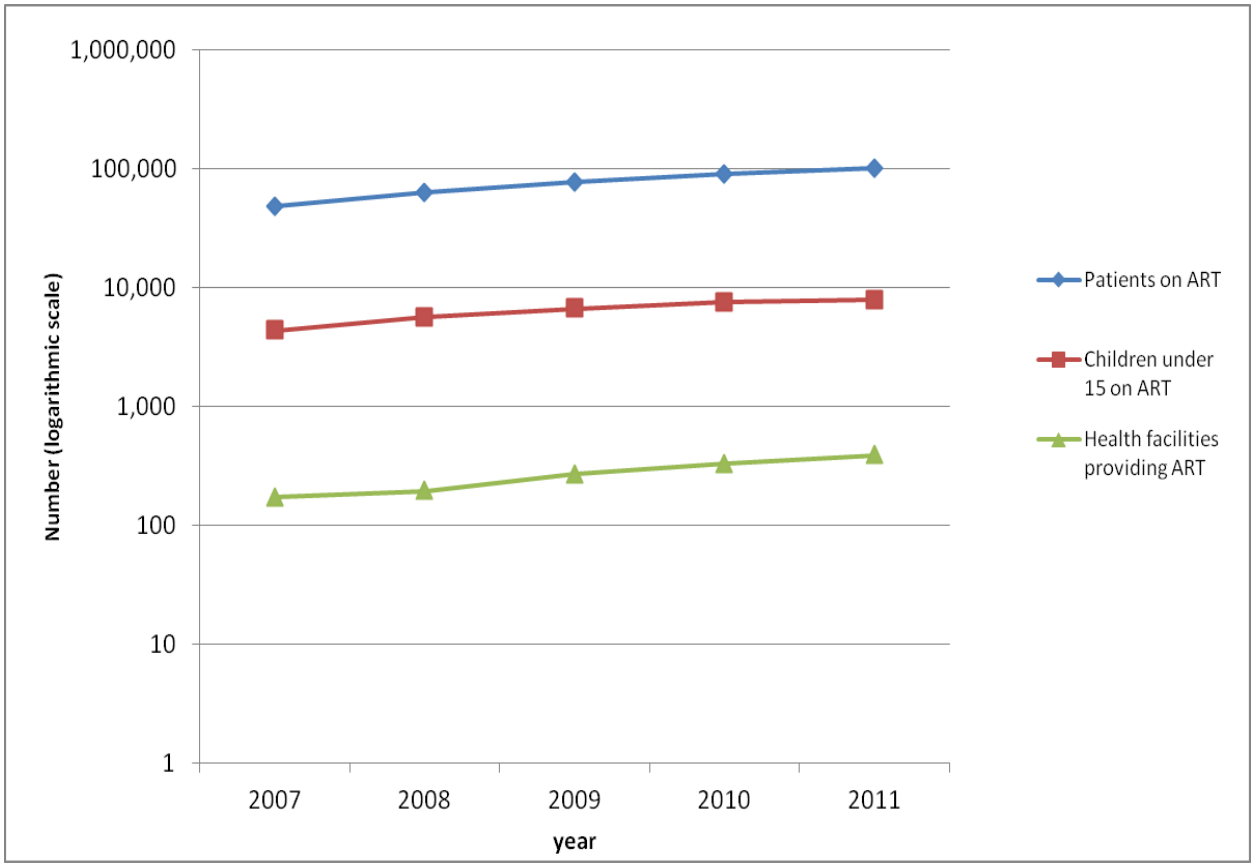
Source: TB program annual report, 2011

HIV & AIDS

Care and Treatment

Figure 24 shows the growing number of health facilities providing antiretroviral therapy (ART) and the increased number of persons on ART from 2007 to 2011. From 2010 to 2011, 62 new health facilities where equipped to provide ART. There is a positive relation between the number of health facilities providing ART and the number of persons on ART, which increased by 11% from 90,668 persons in 2010 to 100,677 in 2011. Children on ART represent about 8% of all ART patients.

Figure 24: Health facilities providing ART and persons on ART, 2007 - 2011



Source: HIV program annual report, 2011

Voluntary Counseling and Testing (VCT)

As shown in Table 35, in 2011, 2,524,684 people were tested for HIV through voluntary counseling and testing (VCT) services (up from 1,641,752 in 2010) and 94% of these individuals knew their test results. From 2010 to 2011, the average number of people voluntary tested for HIV in all health facilities increased by 35%. The number of VCT sites also increased by 12%, from 434 in 2010 to 485 in 2011 (TRAC Plus/HAS Unit, 2010 and 2011 Annual Reports).

Table 35: HIV tests in VCT and PMTCT services, 2011

	Number of Persons Tested	Number of Persons Tested who Received their Results	HIV +	% HIV+	Number of Sites Conducting HIV Tests
VCT or Provider-initiated Testing (PIT)	2,524,684	2,370,679	32,612	1.3%	485
PMTCT	322,650	322,458	5,451	1.7%	452
Males Tested during their Partner's PMTCT Appointments	272,188	272,188	4,897	1.8%	452

Source: HIV program annual report, 2011

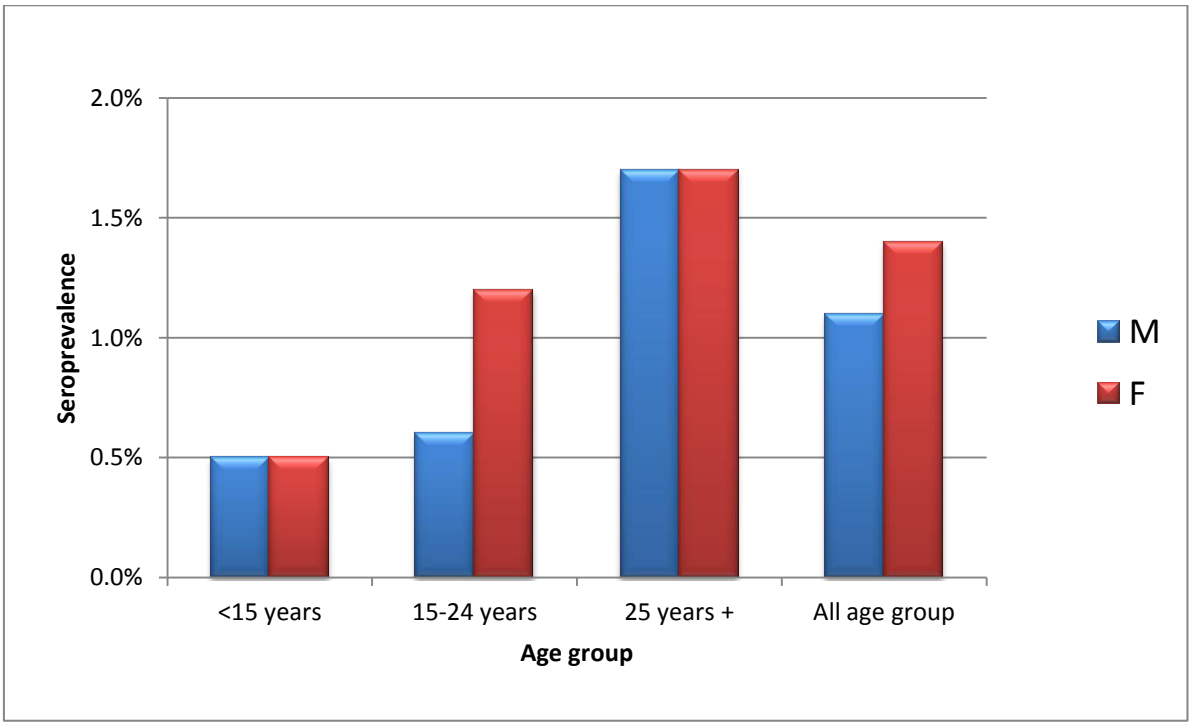
In 2011, about half of those tested for HIV were over 25 years (52%). The seroprevalence of HIV was higher among people over 25 years at 1.7%, which was down from 3.1% in 2010. In the 15 to 24 age group, the seroprevalence was estimated at 0.6% in males and 1.2% in females. Table 36 and Figure 25 show the number of people tested for HIV, the number of HIV positive cases, and the percentage of HIV positive cases, with each category divided by sex and age group.

Table 36: HIV seroprevalence by age group and sex in VCT and PIT, 2011

	<15 years		**15-24 years**		**25 years +**		**Total**	
Sex	M	F	M	F	M	F	M	F
People Tested	166,883	254,378	357,361	466,204	601,173	741,685	1,125,417	1,462,267
Number of HIV+ Cases	915	1,361	2,022	5,729	9,932	12,653	12,869	19,743
% of HIV+ Cases	0.5%	0.5%	0.6%	1.2%	1.7%	1.7%	0.1%	1.4%

Source: HIV program annual report, 2011

Figure 25: HIV seroprevalence by age group and sex in VCT, 2011



Prevention of Mother to Child Transmission of HIV & AIDS (PMTCT)

In 2011, 336,090 women were receiving ANC services and 322,650 of these women were tested for HIV. Among those tested, almost 100% returned for information about their HIV serological status. A total of 5,451women tested positive for HIV in 2011. HIV seroprevalence among pregnant women decreased from 2.8% in 2010 to 1.7% in 2011.

Rwanda has started to implement the new WHO recommendations of provision of antiretroviral (ARV) triple therapy to HIV-infected pregnant women, starting at 14 weeks of pregnancy. From January to December 2011, 8,142 pregnant women and 7,571 babies born to HIV+ mothers received ART prophylaxis (see Table 37).

As shown in Table 38, 272,188 partners were tested for HIV during PMTCT appointments, representing a partners/pregnant women ratio of 0.8. The seroprevalence of HIV among partners was 1.8% and 1.6% of all couples tested for HIV were discordant.

Table 37: HIV positive pregnant women and newborns enrolled in PMTCT, 2011

PMTCT Indicators	**2011**
Pregnant women who received ART prophylaxis	8,142
Number of infants born to HIV+ mothers	7,571
Cumulative number of infants born to HIV+ mothers on ART prophylaxis	8,204

Source: HIV program annual report, 2011

Table 38: Number of couples tested for HIV in 2011

	VCT		**PMTCT**	
	Couples Tested for HIV	Discordant Couples	Couples Tested for HIV	Discordant Couples
	100,201	1,680	272,188	4,446

Source: TRAC Plus/HAS Unit 2010 Annual Report

Malaria

Malaria-related data was collected from the HMIS, SIScom, malaria reports, and surveys such as the DHS, the malariometric survey, and the Health Facility Survey.

In 2011, malaria was the eighth leading cause of morbidity and the third leading cause of mortality in Rwanda. From January 1, 2011 to December 31, 2011, there was a total of 208,498 uncomplicated malaria cases in Rwanda and, at the community level, there were 138,821 fever/malaria cases were among children under five. An additional 5,307 severe malaria cases were registered in Rwanda in 2011 (see Table 39).

A comparison of data from 2005 and 2011 shows that there has been extraordinary progress in the fight against malaria in Rwanda:

- 86% decline in malaria incidence
- 87% decline in outpatient malaria cases
- 74% decline in inpatient malaria deaths
- 71% decline in malaria test positivity rate (TPR)

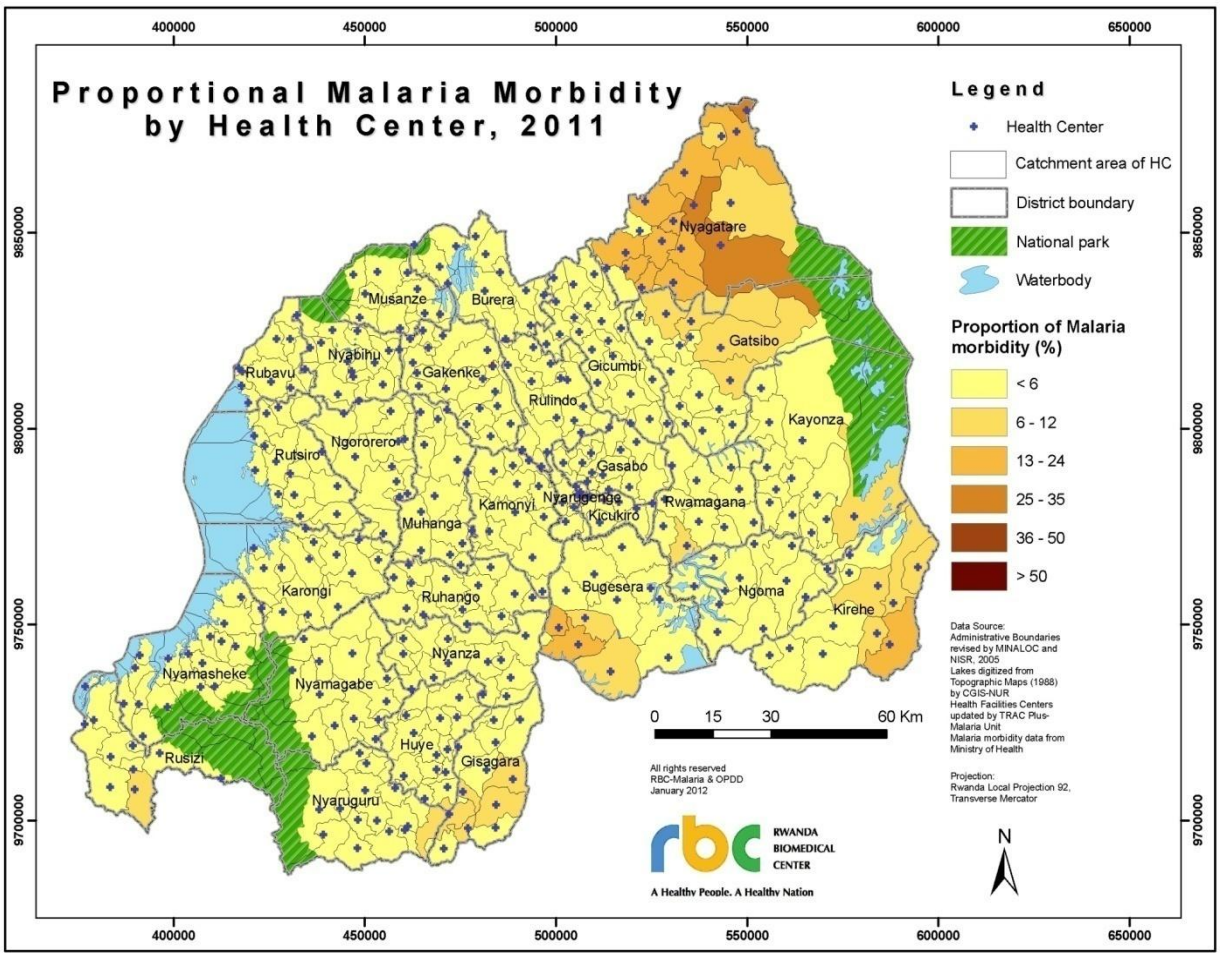
Table 39: Malaria cases at health facilities and the community level, 2009 - 2011

Facility Type	Malaria Diagnosis	2009	2010	2011
Health Center	Simple Malaria (Confirmed)	691,110	600,546	207,304
	Simple Malaria (Presumed)	639,974	23,707	1,194
District Hospital	Severe Malaria	12,171	10,142	5,307
	Deaths due to Malaria	809	670	380
Children under Five Treated by CHWs	Fever	455,279	549,011	51,683
	Simple Malaria (Confirmed)	0	32,106	87,138
Total		1,798,534	1,215,512	352,626

Sources: National HMIS/SIScom Databases, 2009-2011

In 2011, 99% of malaria cases at health facilities and 63% of malaria cases at the community level were confirmed before patients were treated with artemisinin-based combination therapy (ACT). The Eastern Province of Rwanda had the most malaria cases at the health facility level, with 152,893 cases, representing 73% of the total malaria cases countrywide. The Southern Province followed with 25,063 malaria cases, representing 12% of the total malaria cases countrywide. As shown in Figure 26, the five top districts with high malaria morbidity at the health facility level were Nyagatare (86,943), Bugesera (17,519), Gatsibo (16,983), Rusizi (16,306), and Kirehe (15,725).

Figure 25: Map of proportional morbidity for malaria in health centers, 2011



Source: National HMIS Database, 2011

During 2011, 873,760 long-lasting insecticidal nets (LLINs) were distributed countrywide to households, pregnant women, and children under five as follows:

- 529,939 LLNs were distributed to households
- 228,254 LLINs were distributed to pregnant women
- 58,724 LLINs were distributed to children under five
- 56,843 LLINs were distributed to boarding schools

A seventh round of indoor residual spraying (IRS) was implemented in all sectors of the Kirehe, Nyanza, Bugesera, Gisagara, and Nyagatare Districts, from August to October, 2011. A total of 358,804 structures were sprayed using Deltamethrin insecticide.

The following table shows Rwanda's progress in malaria control, by intervention, from 2005 to 2011.

Table 40: Rwanda progress in malaria control interventions, 2005 – 2011

Indicator	2005	2007/ 2008	2010/2 011	Data Source
Mosquito Net Coverage and Use				
Households with at least one ITN	15%	56%	82%	DHS
Households with at least one mosquito net	18%	58%	83%	DHS
Children under five who slept under an ITN	13%	56%	70%	DHS

Children under five who slept under a mosquito net	16%	60%	71%	DHS
Malaria in Pregnancy				
Pregnant women who slept under an ITN	17%	60%	72%	DHS
Pregnant women who slept under a mosquito net	20%	65%	73%	DHS
Prompt, Effective Care Management for Fever				
Proportion of severe malaria cases in the health facilities that were treated in accordance with the national treatment guidelines	44%	68%	82%	Department of Health Financing (HFS)
Proportion of simple malaria cases in the health facilities that were treated in accordance with the national treatment policy	59%		86%	HFS
Proportion of children under five with fever that received timely, correct, and affordable treatment within 24 hours after the onset of fever (at the community level)	2.5%	6%	70%	DHS and IMCI rapid evaluations
Malaria Prevalence and Anemia				
Proportion of women of reproductive age with severe anemia	< 1	< 1	< 1	DHS
Proportion of children 6 - 59 months with severe anemia	0	0.4%	1.0%	DHS
Malaria prevalence				
Children		2.6%	1.4%	DHS
Women		1.4%	0.7%	DHS

Laboratory

During 2011, approximately 78.4% of all reported laboratory tests were conducted at the health center level. As shown in Table 41, 52.8% of these tests were blood tests, 20% were thick blood smear tests, and 11% were stool exams.

Table 37: Type of laboratory tests conducted at different health facilities, 2010 - 2011

Type of Lab Exam	2010			2011		
	Health Center	District Hospitals	Total	Health Center	District Hospitals	Total
Thick Blood Smear	5,274,334	264,380	5,538,714	1,670,528	91,768	1,762,296
Stools	2,113,024	129,589	2,242,613	977,427	60,733	1,038,160
Urine	845,568	22,606	868,174	489,382	93,829	583,211
Sputum	164,270	95,459	259,729	220,061	93,196	313,257
Blood	5,176,155	112,799	5,288,954	3,533,984	1,251,173	4,785,157
Other	183,394	41,263	224,657	219,624	363,827	583,451

Source: National HMIS Database, 2010 and 2011

Surgery

A total of 83,690 surgical interventions were performed during 2011, an increase of 8% percent since 2010 (see Table 41). Over half of all surgeries performed in 2011 were urgent interventions (56%) and the most common type of surgery reported was major surgery (62.4%).

Table 38: Type of surgery performed, 2010 - 2011

Type of Surgery	2010			2011			% change of total surgery
	Planned	Urgent	Total	Planned	Urgent	Total	
Major Surgery	15,890	30,643	46,533	17,555	34,639	52,194	62.4
Minor Surgery	18,192	12,744	30,936	19,210	12,286	31,496	37.6
Total Surgies	**34,082**	**43,387**	**77,469**	**36,765**	**46,925**	**83,690**	100

Source: National HMIS Database, 2009 and 2010

Table 39: Selected surgical interventions, 2010 - 2011

Selected Surgical Interventions	2010			2011		
	Planned	Urgent	Total	Planned	Urgent	Total
General Surgery	10,406	2,604	13,010	12,625	1,880	14,405
Appendectomy	106	73	179	110	60	170
Hernia	1,899	188	2,087	1,725	176	1,901
Laparotomy	362	508	870	246	408	654
Thyroidectomy	145	1	146	159	0	159
Cataract	2,088	5	2,093	1,924	0	1,924
Adenomectomy	83	3	86	63	0	63
Trachoma	1	1	2	2	0	2
Glaucoma	243	0	243	268	0	168
Others	5,479	1,825	7,304	8,128	1,236	9,364
Gyneco-obstetrical (G-O) Surgery	2,661	26,849	29,510	2,740	40,027	34,291
Caesarean Section	1,524	24,806	26,330	1,779	38,258	40,037
Hysterectomy	346	92	438	265	110	375
Ectopic Pregnancy	24	116	140	9	140	149
Other Laparotomies (G-O)	388	272	660	368	311	679
Myomectomy	196	13	209	256	18	274
Curettage	183	1,550	1,733	63	1,190	1,253
Orthopedic Surgery	2,823	2,103	4,926	2,190	1,208	3,398
Amputations	151	44	195	147	71	218
Osteosynthesis	643	48	691	610	27	637
Other	2,029	2,011	4,040	1,433	1,110	2,543

Source: National HMIS Database, 2010 and 2011

Radiology

Reports from district hospitals on medical imagery and other diagnostic testing procedures indicate that over 13,1732 x-rays were conducted in 2011, which represented 76.2% of all medical imagery exams conducted that year. Among these x-ray exams, 51% were for bones. The second most common medical imagery exam performed was the echography exam, which made up 22.1% of all exams conducted in 2011 (see Table 44).

Table 40: Medical imagery exams and other diagnostic testing procedures, 2010 - 2011

Exam Type	2010	2,011	% change
Total Radiology Exams	113,970	131,732	76.2
Lungs	50,632	57,960	44
Bones	57,108	67,034	51
Abdomen without Preparation	3,569	3,911	3
Abdomen with Dyes	1,078	863	0.7
Other Radiology	1,583	1,964	0.5
Gastroscopy	858	1,454	0.8
Echography	29,790	38,249	22.1
Electo-cardiogram	665	1,415	0.8
Total Exams	145,283	172,850	

Source: National HMIS Database, 2010 and 2011

Blood Bank and Transfusion

Table 45 shows the number of blood units collected by national blood transfusion centers from 2000 to 2011. In general, the number of blood samples collected increased each year. The proportion of HIV + blood donors decreased from 1.6% in 2000 to 0.5% in 2011. In contrast, the proportion of syphilis increased from 0.7% in 2000 to 1.8% in 2011.

Table 41: Blood collected and TTIs, 2000 - 2011

Year	Blood Samples Collected	HIV	Hepatisis B Virus	Hepatitis C Virus	Syphilis
2000	22,970	1.6	2.9	2.1	0.7
2001	26,650	1.3	3.2	1.9	0.5
2002	27,930	1.06	3.11	1.78	0.93
2003	30,870	1.13	2.76	3.17	0.72
2004	28,770	1.36	2.84	2.24	0.64
2005	37,840	1.1	2.6	1.4	0.8
2006	38,530	0.85	2.65	1.25	0.65
2007	32,543	0.54	2.46	1.18	0.42
2008	35,495	0.74	2	0.94	0.34
2009	40,567	0.28	1.9	0.76	0.96
2010	40,982	0.3	1.4	1.1	1.3
2011	37,811	0.5	1.61	2.94	1.77

Performance-based Financing (PBF)

In 2011, 11,908,025,052 FRW was used to fund PBF activities. HIV related activities accounted for 32.4% of these activities and referral or specialized hospitals account for 29% of the activities. Fourteen percent of the PBF funding was devoted to the minimum package of activities at health centers (see Table 46).

Table 42: Performance-based financing (PBF) payments by year and PBF package, 2010 - 2011

Financing	Total Rwandan Francs (FRW)
Referral hospitals: CHUK, CHUB, KMH	2,812,601,160
Specialized hospitals: NDERA HNP, SCPS, SAMU, KPH	638,300,651
Complementary Package of Activities at District Hospitals	1,871,235,630
Minimum Package of Activities at Health Centers	1,658,513,669
Steering Committee	125,406,570
HIV	3,157,801,622
Payment of Equity Indices	134,579,325
TB	843,696,440
Complementary Package of Activities and HIV	705,889,985
Total	**11,908,025,052**

Source: PBF Database,, 2010 and 2011

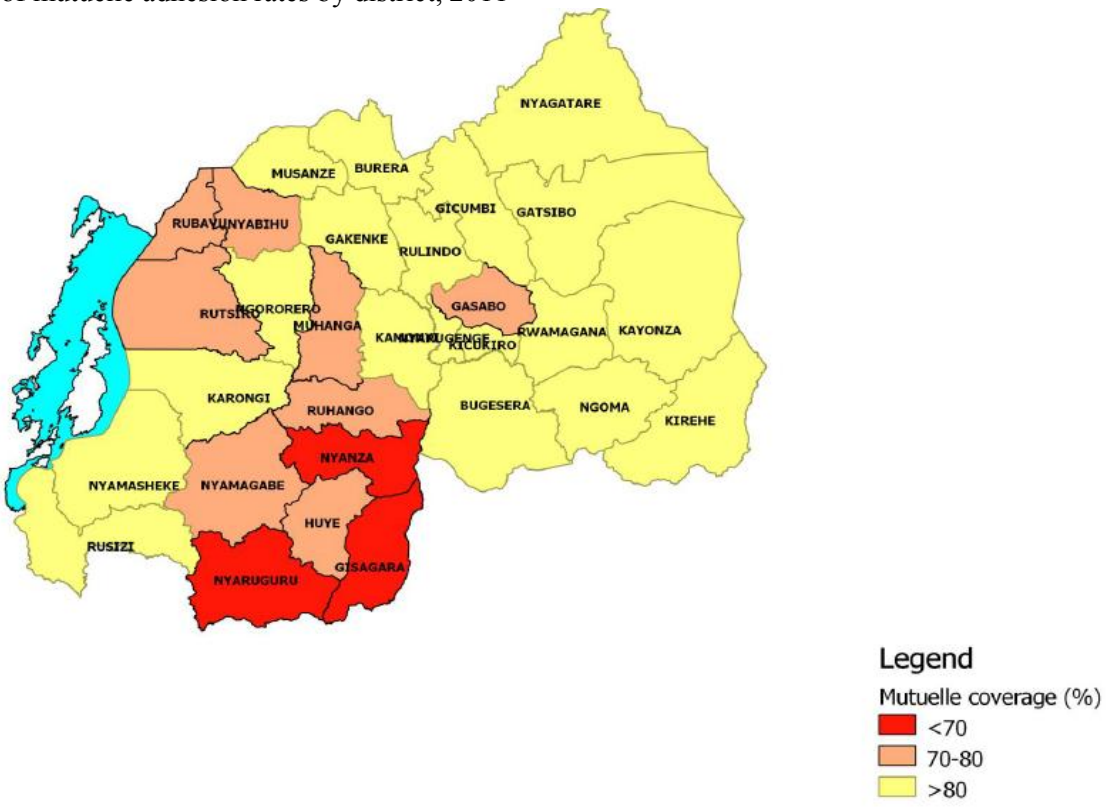
Table 43: Average quality scores from health center PBF quality assessments, *

Service	Annual Change (average)	Overall Change (average)
Institutional Delivery	104.3%	120.6%
Outpatient Consultation	116.7%	133.8%
Pre-natal Consultation	68.6%	98.0%
Financial Management	58.9%	38.9%
Drug Management	36.3%	25.9%
Health Center Hygiene	29.9%	32.3%
Laboratory	31.0%	32.9%
HIV & AIDS Care and Treatment	42.2%	25.9%
General Organization and Community Participation	138.1%	119.6%
Family Planning	99.9%	113.6%
Nutrition Surveillance and Rehabilitation	26.4%	22.5%
Tuberculosis Control	36.5%	17.5%
Vaccination	33.7%	33.1%
Total	64.0%	63.9%

Community-based Health Insurance/Mutuelle (CBHI)

Membership has continued to expand in the community-based health insurance program. Average adhesion rate for the country stood at 82% in 2011. About 25% of districts had more than 89% community based health insurance coverage and about 25% of districts had a coverage rate less than 73%. The map below shows coverage rate by district in 2011.

Figure 26: Map of mutuelle adhesion rates by district, 2011



As shown in Table 48, individual membership payments represented 42% of the income for community-based insurance in 2011, which was less than the 46% contribution in 2010. The total expenditure represented 124% of the total income and, consequently, a loss of -3,629,168,702 RFW. The cost for hospitalization, OPD, drugs, and others medical care for mutual members increased dramatically, from 9,997,553,161 in 2010 to 17,053,816,816 in 2011.

Table 48: Income and expenditure of community based insurance, 2010 - 2011

Income	**2010**	**2011**
• Individual membership payments to the mutuelle fund	7,550,768,265	6,398,402,469
• Membership payment on behalf of an individual by an organization (e.g., Global Fund, commercial firms, etc.)	2,870,891,857	2,485,542,000
• Other recipients (e.g., copayment, donations, interest, Minicofin, etc.)	5,954,045,397	6,380,224,969
Total Income	**16,375,705,519**	**15,264,172,438**
Expenditure		
• Cost of hospitalization for mutual members (i.e., care, OPD, drugs, etc.) and payments made to other heath centers for care provided to mutual members	5,877,736,888	17,053,816,816
• Amount transferred to the district pooling risk	4,119,816,273	
• Running cost for mutual section (e.g., salaries, stationary, supervision, training, etc.)	1,162,811,154	1,839,521,324
Total Expenses	**11,160,364,315**	**18,893,338,140**
Profit/Loss	**5,215,341,204**	**-3,629,168,702**
% Profit/Loss	**31.8%**	

Source: CBHI department, annual report

Sources of Data

Health Management Information System (HMIS)

The main source of data on morbidity and mortality was the HMIS, Gestion du Système d'Information Sanitaire (GESIS). This system had been recently upgraded to capture data from monthly and annual reporting formats that were revised at the end of 2007. Data was recorded in health centers and hospitals on registers and patient forms and was then compiled monthly and transmitted on paper forms to district hospitals. These reports were entered into the HMIS at the district hospitals and transmitted electronically to the HMIS Unit at the central level, where data were uploaded into the central database. At the time this analysis was produced, 93.5% of expected monthly reports were entered into the system for all district hospitals and health centers in Rwanda. For certain types of analysis, such as coverage rate calculations, adjustments were sometimes made to compensate for under-reporting. It is important to note that the HMIS does not currently include private health facilities, nor does it include data from national reference hospitals.

National Institute of Statistics Rwanda

Population denominators have been obtained from the National Institute of Statistics Rwanda (NISR), population projections are based upon the 2002 census.

Tracnet

Rwanda's TRACnet is a dynamic phone and web-based information management solution that collects, stores, retrieves, and disseminates critical program, patient, and drug information related to HIV & AIDS care and treatment. Funded through Center for Disease Control/Presidents Emergency Plan for AIDS Relief (CDC/PEPFAR), the system was developed by Voxiva and supports the Government of Rwanda in the rapid expansion of HIV & AIDS clinical services in hospitals and health centers throughout the country. Under the leadership of the MOH and the Treatment and Research AIDS Center (TRAC), TRACnet has increased the efficiency of Rwanda's HIV & AIDS program management and has enhanced the government's capacity to monitor the quality of patient care. Deployment of TRACnet started in late 2004 and, as of December 2010, the system has been scaled up to 337 facilities providing care and treatment services to 89,660 ART patients. TRACnet collects HIV & AIDS aggregated data from all health centers providing HIV & AIDS services, with a satisfactory completeness of 90% and timeliness of 62%.

PBF Database

PBF uses a web-based database to collect a very selected number of mostly output indicators that are used to track progress and calculate performance based payments for CHW cooperatives, health centers, and district hospital. The system also uses data from quarterly quality evaluations to ensure that data and service quality are maintained, and to reduce the performance payment accordingly. The system is in the process of being expanded to integrate community-based services (i.e., community PBF). PBF data is cited occasionally for comparison purposes because the reporting rate is virtually 100% and the data are carefully validated each quarter.

Community-based Health Insurance (CBHI) Indicator Database

The community-based health insurance program uses a web-based database to collect a very limited number of indicators that are used to track progress and determine the financial viability of individual CBHI or mutuelle sections. The reporting rate for 2010 was approximately 84% of the 428 mutuelle sections reporting.

Rwanda District Health System Strengthening Tool (DHSST)

Over the past few years, the Clinton Foundation has been supporting the MOH to strengthen its district health system, leading to the development of Rwanda's DHSST. In 2008, this framework was applied to all districts of Rwanda. In 2009, a completely new, web-enabled version was developed and data were collected in December, 2010. The DHSST is a costing and strategic planning tool for use by district health units, health centers, and district hospitals in Rwanda.

The data collection phase of this project gathered valuable data on, amongst other areas, health infrastructure, equipment, finances, and staffing to facilitate gap analyses and needs costing. The tool collects data from 40 district hospitals and 396 health centers and will soon include the national reference hospitals. It does not include private health facilities. It is currently being simplified so that it may be updated on an annual or semi-annual basis by all districts.

Rwanda Interim DHS 2007-2008 (RIDHS)

The RIDHS was carried out from December 2007 to April 2008 as a follow-up to three previous surveys that took place in 1992, 2000, and 2005. A total of 7,377 households were interviewed. Three questionnaires were administered including a household questionnaire, a women's questionnaire, and a men's questionnaire. The survey covered demographic characteristics, marital status, birth history, knowledge and use of family planning methods, fertility preferences, antenatal and delivery care, breastfeeding practices, vaccination and childhood illnesses, male circumcision, and blood testing for anemia and malaria.

Annex 1

Table 44: Classification of staff categories by qualification

Staff Category	Qualification
Administrative Staff and Support Staff	Administrator A1, A Administrator A2, Public Administrator A0, Accountant A0, Accountant A1, Accountant A2, C Accountant A3, Law A0, Law A1, Law A2, Economist A0, Economist A1, E Economist (MA), Financial A1, Financial A0, Management A0, Management A1, Management (MA), Secretary A1, Secretary A2, Secretary A3, Law (MA), Communication A0, Demographer A0, Computer Technician A0, Other Support Staff, drivers, Electrician A1, Electrician A2, Electrician A3, Electromechanical Engineer A0, Electromechanical Engineer A1, Electromechanical Engineer A2, Electrician (A0), Electrician (A1), Electrician (A2), Documentalist
Doctors	Doctors, Specialist Doctors
Laboratory Technician	Bio-Chemistry A2, Human Biologist A1, LABO.A0, LABO.A1, LABO.A2, LABO.A3
Nurses	Medical Assistant A1, Medical Assistant A2, INF. (MA),.NurseA0, Nurse.A1, Nurse.A2, Nurse.A3, Health auxilliary,
Midwives	Midwife A1
Paramedical	Anaethesiologist A0, Anaethesiologist A1, Dentist A0, Dentist A1, Hygienist +Assistant A1, Hygienist +Assistant A2, Physiotherapist A0, Physiotherapist A1, Physiotherapist A2, Physiotherapist A3, Physiotherapist (MA), Environmental Health A0, Nutritionist A0, Nutritionist A1, Nutritionist A2, Ophtalmologist A1, Orthopedist A1, Psychiatrist A0, Clinical Psychologist A0, Clinical Psychologist A1, Radiologist A1, Radiologist A2, Mental Health A1, Public Health A0, Public Health A1, Ophtalmologist A0, ASS SOC.A1, ASS SOC.A2, Educators .A3+Mon Ens., Educators A0, Educators A1, Educators A2, Sociology A0
Pharmacist	Pharmacist A0, Pharmacist A1
Other	Other (no qualification mentioned)