



**MINISTRY OF HEALTH
ERITREA**

**NATIONAL MASTER PLAN
FOR
NEGELECTED TROPICAL DISEASES
2015-2020**

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Acronyms

ADR	Adverse drug reactions
AFRO	World Health Organization Regional Office for Africa
AIDS	Acquired Immunodeficiency Syndrome
APOC	African Programme for Onchocerciasis Control
ARI	Acute Respiratory Infections
CDC	Communicable Disease Control
CLS	Clinical Laboratory Science
CM	Case management
DF	Dengue Fever
DKB	Debubawi Keih Bahri Zone
DSS	Decision Support System
HF	Health Facility
HSSDP	Health Sector Strategic and Development Plan
HIV	Human Immuno Deficiency Virus
HMIS	Health Management Information System
HQ	Head quarter
IDM	Intensified Disease management
IDSr	Integrated Disease Surveillance & Response
IPD	In-patient Department
KEMRI	Kenya Medical Research Institute
LEISH	Leishmaniasis
LEP	Leprosy
LF	Lymphatic Filariasis
MLT	Medical Laboratory Technician
MOE	Ministry of Education
MoH	Ministry of Health
NGO	Non-governmental organizations
NHL	National Health Laboratory
NMFA	National Medicine and Food Administration
OPD	Out-patient Department
PCT	Preventive chemotherapy
PHC	Primary Health Care
SCH-	Schistosomiasis
SKB	Semenawi Keih Bahri Zone
TF-	Trachomatous Follicular Inflammation
TRA	Trachoma
TS	Trachomatous Conjunctival Scarring
TT	Trachomatous Trichiasis
CO	Corneal Opacity
VHCP	Village Health Committee Promoters

WHO

World Health Organization

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Forward

Neglected Tropical Diseases (NTD) as the name indicates are a group of diseases that are more or less neglected. The burden of these diseases in endemic countries is high and despite the availability of safe and cost-effective interventions for their prevention and control the resource allocated for NTDs is still inadequate.

The known endemic NTDs in Eritrea are Schistosomiasis, Intestinal Helminthiasis, Trachoma, Lymphatic Filariasis, Leprosy, Dengue Fever and Leishmaniasis and. Exceptionally Eritrea was certified free of Guinea worm disease in 2011. The Neglected Tropical Diseases Programme (NTDP) focuses on an integrated control of the endemic 7 out of the 13 diseases that WHO has classified as common NTDs. Other NTD diseases such as Rabies, Brucellosis and Anthrax which are not on this priority list will be incorporated in the Zonal or sub-zonal activities where they are endemic. NTDP will use cost-effective interventions for prevention, control and elimination of these endemic NTDs.

In order to tackle these diseases, the Eritrea MOH is strengthening with human resources the recently established NTDP under the Communicable Disease Control Division (CDCD). The aim of NTD programme is to increase access to effective drugs for the affected communities. This is supported by other interventions for vector control as well as health education and promotion, environmental management and safe drinking water. An integrated approach to the control of NTDs will save costs and, strengthen the health system for greater impact. The PHASE approach which is preventive chemotherapy, health education, access to clean water, sanitation improvement and environmental manipulation will be the priority activities.

The main objective of this revised Master Plan is to meet the 2020 NTD elimination targets and goals as defined in WHA resolution 66.12 and in the Regional Committee Resolutions. It will provide a tool that clearly articulates the strategies for joint planning, budgeting and resource mobilization for NTDs control and elimination through sustainable integrated interventions in line with WHO guidelines. It addresses the gaps and challenges from the experiences and lessons learned from the programme implementation in the past years.

The MOH with the collaboration of its stakeholders and partners, including local communities, will achieve the goals set in this Master Plan. The NTD Master Plan 2015-2020 is therefore, an expression of government's commitment and determination to confront NTDS and deliver the best possible response, at all levels, to the people of Eritrea.

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We also thank the Eritrean Mapping and Information Center for providing valuable geographic information of the country.

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INTRODUCTION

This document, the NTD Master Plan, is a comprehensive multi-year plan for the control of NTDs in Eritrea. It is a tool for effective planning and implementation of sustainable NTD programmes in the country. It articulates the programme goals, objectives and activities based on extensive situation analysis and address all components of the NTD programmes relevant to the country. It enhances synergies among various NTDs and provides the basis for integrated NTD project plans. It includes costing and financing requirements for effective NTD programme performance. The Ministry of Health in collaboration with WHO and other stakeholders has updated the former strategic plan to this new document which runs from 2017- 2021. This revised document incorporates the lessons learnt from the NTD implementation as articulated in the previous Master Plan and what needs to be done to achieve the 2020 NTD goals. It is the basis for annual NTD work plans and it identifies and integrates activities with relevant health units and Ministries to address cross-cutting problems.

As elsewhere in the developing world, Eritrean communities living in rural and urban areas are more affected by communicable diseases that are mostly preventable and curable. One such group of diseases is Neglected Tropical Diseases (NTDs) which for many reasons have been neglected in detecting, preventing and controlling them. This is despite the fact that the country's facility based health information system is capturing the incidence of the diseases and that they are preventable. NTDs posing public health concerns in Eritrea include Schistosomiasis (SCH), Lymphatic filariasis (LF), Soil Transmitted Helminthiasis, Trachoma (TRA), Dengue Fever (DF), Leishmaniasis (LEISH) Anthrax, Rabies, Brucellosis and Leprosy (LEP). In order to better address these diseases, the Ministry of Health has established NTDs unit under the communicable disease control division (CDCD) following the restructuring of the ministry. The CDCD has championed the review and update of this strategic plan in line with the regional strategy on NTDs in the WHO African Region.

The goal of the NTDP is to improve the health and socio-economic status of Eritreans by reducing significantly the morbidity, disability and mortality caused by the Neglected Tropical Diseases through an integrated delivery of interventions, at a cost-effective approach, to control and eliminate all targeted NTDs”

Based on the mapping exercise conducted in 2014 and 2015, distribution of PCT NTDs in Eritrea is well established. The incidence and prevalence of NTDs can be minimized with safe and effective prevention and treatment strategies such as preventive chemotherapy and integrated vector control. Eritrea has taken considerable action in the past few years in controlling some of the above mentioned neglected diseases. Mass drug administration has been given to school children against schistosomiasis and Soil Transmitted Helminths in selected high burden subzones. Trachoma prevalence in Eritrea has declined owing to mass drug administration, promotion of personal/facial hygiene activities, and the complications were addressed by scaling up successful surgeries. Furthermore, Integrated Vector Management designed to tackle malaria vectors has played a great role in fighting LF and Dengue transmission.

Taking into consideration endemicity-overlaps and similarities of some NTDs, an integrated approach in controlling the diseases must be pursued wherever feasible in order to best achieve the set goals. The following strategies are planned to aid the NTD program attain its ambitions:

- Mass Drug Administration (MDA) for PCT –NTDs.
- Strengthening case detection and management of IDM-NTDs.
- Transmission control through effective and comprehensive vector control, improved safe water supply and sanitation by prioritizing endemic communities in collaboration with relevant agencies.
- Intensive health education and promotion activities to improve including improved environmental and personal hygiene.

The activities will focus primarily on preventive chemotherapy, health education, and access to clean water, sanitation improvement and environmental manipulation (PHASE).

The new NTD Master Plan has enjoyed the commitment and acknowledgement of NTD stakeholders and partners whose inputs were incorporated in finalizing the document. It will henceforth be the TOOL for joint planning, implementation and monitoring of the achievements of the NTD programme in Eritrea.

By provision of adequate funding and following a comprehensive monitoring and evaluation plan the current strategic plan can be implemented successfully thereby contributing to the health and socio-economic well-being of the Eritrean people.

PART 1: SITUATION ANALYSIS

This section describes the country profile, the health system milieu and the programme environment within which the NTDs programme will be developed and implemented.

1.1 Country Profile

This section provides information on factors relating to:

- i) The administrative, demographic and community structures.
- ii) Geographical characteristics
- iii) Socio-economic situation and indicators
- iv) Transportation, communications and technology.

These national environmental and contextual factors are important understanding the distribution of NTDs and their control/elimination.

1.1.1 Administrative, demographic and community structures

Administratively the country is divided into six administrative zones (see figure1) known as Zobas, namely; GashBarka (GB), Anseba, Debub, Debubawi Keyh Bahri (DKB), Maakel (Ma) and Semenawi Keyih Bahri (SKB). The zones are further divided into 58 sub-zones, known as sub-Zobas, 699 administrative areas (called *Memhdar Kebabi*) and 2,564 villages.

Figure 1: Administrative map of Eritrea



Although, no population census has been carried out to date, the estimated population of the country at the end of 2012 was 3,952,788. The majority of the population (65%) resides in rural areas (EPHS, 2010). The population growth rate is 3.0% and total fertility rate was 4.8 children per woman in 2010 (EPHS 2010). Life expectancy at birth is 61 years for both sexes (World Bank, 2010). There are 340 health facilities and 75% of the population have access to health services at a radius of 10Kms (HMIS 2012). There are 870 Primary/elementary schools in Eritrea, distributed 6-30 per sub-Zoba and enrolment in 2011-2012 was 482,609 (Ministry of Education 2012).

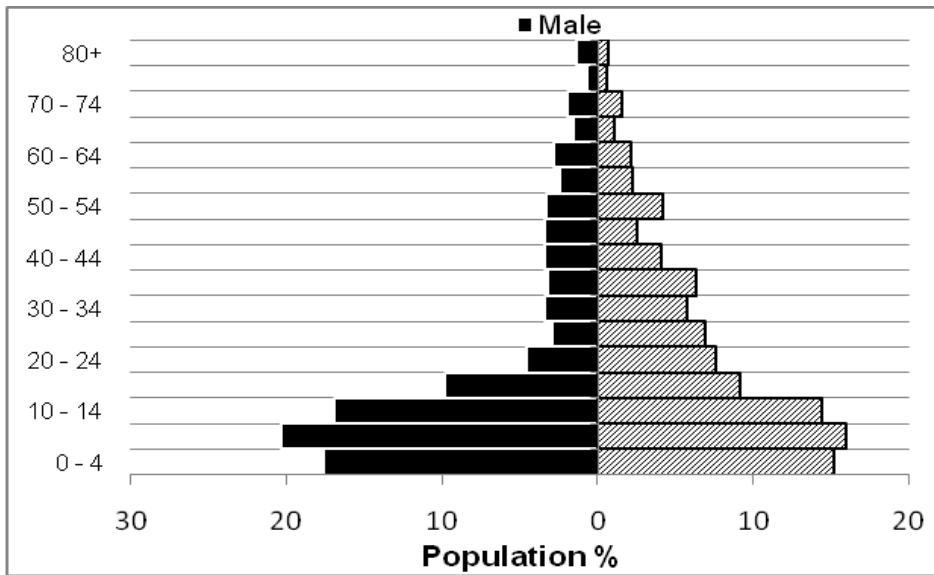
Table 1: National population data, schools, and health facilities at sub-zonal level

Zone	Sub-Zone	No. of villages	Total population	Under-fives (13.7)	5-14 years (29.2%)	No. of primary schools	No. of health facilities		
							Hospitals	H.C	H.S
Anseba	Elabered	55	63963	10,217	20,435	22		1	3
	Geleb	39	42922	7,262	14,525	10			2
	Keren	52	106,602	15,990	31,980	30	1	1	5
	Hagaz	81	90,342	13,551	27,102	18		1	5
	Halhal	29	71,441	10,716	21,432	9		1	2
	Habero	36	65,328	9,799.	19,598	10		1	3
	Asmat	27	49,130	7,369	14,739	8		1	2
	Kerkebet	55	40,147	6,022	12,044	9		1	3
	Sela	22	13,742	2,061	4,122	7			1
	Adi Tekelizan	37	45,655	6,848	13,696	9		1	
	Hamelmalo	41	37,738	5,660	11,321	11		2	1
	Zonal population	474	636,661	95,499	190,998	143	1	10	27
Debub	Debarwa	81	124,667	18,701	37,402	25		1	6
	Areza	104	114,635	17,195	34,390	25		2	6
	Mendefera	68	80,041	12,006	24,012	16	1	1	2
	Dekemhare	46	70,312	12,882	25,765	26	1		5
	Segeneiti	39	69,454	10,546	21,09	21		3	3
	Adi Keyih	99	112,111	10,418	20,836	21	1		5
	Senafe	120	51,845	16,816	33,633	27	1		7
	Tsorona	88	116,724	7,776	15,553	13		1	6
	Adiquala	109	81,245	17,508	35,017	20	1	1	2
	Emni-Haili	100	81245	12,186	24,373	22		1	2
	Mai-Aynce	59	54156	13,661	27,322	12		2	1
	Mai-Mine	73	91074	8,123.40	16,246	14		2	1
	Zonal population	986	1,047,509	157.823	315,647	242	5	14	46
DKB	Areta	48	27,434	4,115	8,230	8	1		3
	Maekel Denkaliala	21	19,152	2,872	5,745	3	1		2
	Debub Denkaliala	34	16,209	2,431	4,862	6			5
	Asseb	6	29,600	4,440	8,880	5	1		1
	Zonal population	109	92,395	13.859	27.718	22	3		11
Gash Barka	Agurdet	103	43,326	6,498	12,997	15	1	1	4
	Barentu	39	29,018	4,352	8,705	16	1	1	5
	Dighe	88	57,239	8,585	17,171	11		1	5

	Forto	84	59,816	8,972	17,944	14		2	3
	Gogne	54	59,269	8,890.35	17,78	13		1	1
	Haycota	91	62,883	9,432.45	18,864	13		1	3
	Logo Anseba	22	53,055	7,958.25	15,916	16		1	4
	Mensura	26	80,143	12,021.45	24,042	16		1	4
	Mogolo	21	31,457	4,718.55	9,437	11		1	2
	Gulug	48	76,673	11,500.95	23,001	20		2	7
	Shambuko	38	47,655	7,148.25	14,296	19		1	3
	Mulki	61	49,517	7,427.55	14,855	13		1	4
	Teseney	62	59,665	8,949.75	17,899	18	1	1	4
	Laalay Gash	89	76,673	11,500.95	23,00	24		1	5
	Zonal population	826	786,389	11,795.835	23,591	219	3	16	54
Maakel	Serejeka	28	77,028	11,554.20	23,10	17		1	7
	Berikh	22	62,331	9,349.65	18,699	16		1	2
	Ghalanefhi	32	66,537	9,980.55	19,961	23		1	4
	North east Asmara	4	159,896	23,984.40	47,968	13	1	1	2
	North west Asmara	3	156,395	23,459.25	46,918	14	1	1	2
	South west Asmara	3	117,217	17,582.55	35,165	8	2	0	4
	South East Asmara	3	111,016	16,652.40	33,304	18		1	1
	Zonal population	93	750,420	112.56	225,126	109	4	9	22
SKB	Ghelealo	46	34,790	5,218.50	10,437	18		2	3
	Foro	58	66,792	10,018.80	20,037	12		1	2
	Dahlak	12	4,254	638.10	1,276	6	0	1	2
	Massawa	15	49,608	7,441.20	14,882	11	1	1	7
	Ghindae	25	89,433	13,414.95	26,829	19	1	2	8
	Shieb	10	76,520	11,478.00	22,956	8	0	1	1
	Afabet	49	145,644	21,846.60	43,693	14	1	1	2
	Nakfa	33	76,872	11,530.80	23,061	11	1	0	3
	Adobha	18	33,645	5,046.75	10,093	3		1	0
	Karora	22	61,856	9,278.40	18,556	8		1	1
	Zonal population	288	639,414	95,912.10	191,824	108	4	11	21
	National population	2776	3,952,788	48,111,526.00		843	20	60	181

Source: HMIS/MOH, MOE

Figure 2: Eritrea population pyramid by age and sex

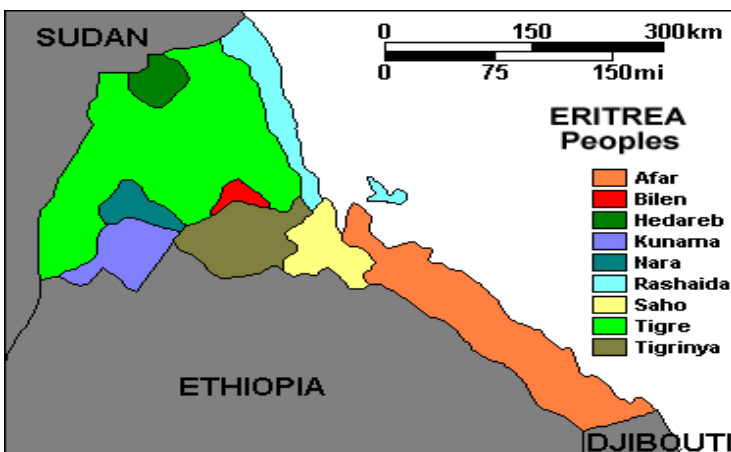


Source: Malaria Indicator Survey, MOH, 2012

Settlement patterns in Eritrea are in small community villages (Adi) led by a community leader (Memhdar Adi) organized into Memhdar Kebabi. A Memhdar Kebabi consists of 3-4 villages on average. The people normally live in stable communities although there are a few nomadic populations in some ethnic groups whom the government is in the process of settling. There are 9 major ethnic groups namely, the Afar, Bilen, Hiedareb, Kunama, Nara, Rashaida, Saho, Tigre and Tigrigna (Figure 3).

Most of the population relies on agriculture for living although there are people involved in fishing and trading.

Figure 3: Peoples of Eritrea



1.1.2 Geographic characteristics

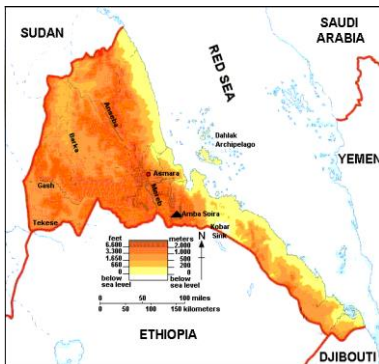
Eritrea is located in the Horn of Africa, between latitudes 12 degrees 42'N and 18 degrees 2'N and longitudes 36 degrees 30'E to 43 degrees 20'E. It is bounded by the Sudan to the North and West, the Red Sea to the East, Ethiopia to the South and the Republic of Djibouti to the Southeast. The country has a surface area of about 124,320 square kilometres with four distinct topographic regions: central highlands (2000 meters above sea-level), western lowlands (1000 meters above sea level), eastern lowlands (500 meters above sea level) and coastal lands (500 meters above sea level). The altitude in the western low land and coastal land favour the existence of lymphatic filariasis.

The highlands of Eritrea have ameliorating climate conditions with vegetative cover and fertile soils which are suitable for agricultural purposes.

In general, rivers in Eritrea are classified in line to where they drain. Thus, there are 3 groups, those that drain into Sudan, (Barka, Mereb/Gash, Anseba and Tekeze rivers), those that drain into the Red Sea (Hadas River), and those that drain into the Afar Depression. Most of these rivers are not perennial. Eritrea has many dams but the major ones include: Gerset, Fanko, Mai Nefhi, Mai Surwa, Badmait, Kerkebet and Tokor.

The rainy season extends from June to September in the western and southern low lands and from October to March in the coastal plains. In general, rains are scarce and the country is prone to recurrent droughts. In addition in the former area receives little rains called “Azmera rains” in the months of April and May. Eritrea has a variety of climatic conditions. Asmara located at 2,350 meters above sea level has a pleasant climate all year (average temperature of 16° Celsius) and receives 508 mm of rainfall annually.

Figure 4: Geographic map of Eritrea



<http://www.eritrea.be/old/eritrea-map6.gif>



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In the highlands, further inland, with an elevation between 1,800 and 2,100 meters the hottest month is usually May (around 30°C) and in the winter (December to February) temperatures are near freezing point at night. The highest Point is Amba Soira (3018 meters above sea level). At sea level along the coast (Massawa, Assab), the period from June to September is very hot (40-50°C).

In the period of December to February (rainy season) the temperature varies from 20 to 35°C. Massawa at sea level has an average annual temperature of 30° C and an annual precipitation of 205 mm (80 inches). In the western lowlands (Agordat, Barentu), the temperatures are comparable to those in the coast.

The presence of dams predisposes the country to schistosomiasis, while Lymphatic Filariasis is mainly found in areas bordering neighbouring countries (Sudan and Ethiopia).

1.1.3 Socio-economic status and indicators

Eritrea is poor country. Agriculture and pastoralism are the main sources of livelihood. Other natural resources such as marine resources, energy resources (oil and gas) and minerals are relatively unexploited. Agriculture is the mainstay of the economy, accounting for 20% of Gross Domestic Product (GDP).

The Population health Survey (2010) findings indicate that infant mortality rate (IMR) was 42 per 1000 live births; under-5 mortality rate 63 per 1000 live births and maternal mortality rate (MMR) at 480 per 100,000 making Eritrea one of the countries in Africa that are on track to reach MDG goal 4.

In Eritrea nearly 72.9% in urban areas and 50% in rural areas have access to an improved source of drinking water. The most common source of improved drinking water is pipedwater with 47.7% of households in rural area have direct access to piped water (EPHS 2010). With the establishment of dams, many farmers are increasingly using irrigation for farming, which has the potential to increase the exposure risk to many NTDs. In rural areas, where about 90.3% of the households have no toilet facilities compared to 35.3% of the households in the urban area (EPHS 2010). Poor sanitation and inadequate access to clean water are predisposing factor to most of the NTDs.

1.1.4 Transportation and communication

In general, Eritrea has improved significantly its transportation infrastructure connecting all the major Zones with Asphalt. The construction of this infrastructure goes down to the sub-zones making easy access through motor vehicles (see Annex 1.2 for distances from major cities). Moreover, Eritrea has renovated its railway stations that goes from Asmara to Massawa and has built a highway that goes around 500 kms connecting the ports of Massawa to Assab. Post war reconstruction program is on-going to address asphaltting of new roads, improving the ports, and repairing war-damaged roads and bridges. Transport Network e.g. accessibility to peripheral areas has shown marked improvements in the last years. There are also two international airports in Asmara and Massawa and 2 local ones in Assab and Gash Barka. Sea Transportation plays a good role in connecting the remote islands with the main land.

Remarkable effort has been undertaken by the government telephone services, Eritrean Telecommunication Services Corporation (EriTel) to connect all the Zones through mobile phones. In early 2012 penetration was 7% for mobile phones, 1% for fixed lines and 11% for internet access. However, growth in the mobile and internet sector is now accelerating due to roll out of a third generation (3G) mobile network by the ErTel. Postal, radio, and television are common means of communication provided by the government which cover the entire country.

There are still some limitations in the existing transportation and communication systems in relation to the NTD program management and improvements are required to make this system reliable for disease surveillance and control/elimination activities.

1.2 Health System Situation Analysis

1.2.1 Health System Goals & Priorities

Health systems goals and priorities provide indicators that are used to evaluate progress over time within a country and relative performance across countries and regions. The vision of the Eritrean health policy is to improve health status, wellbeing, productivity and quality of life of the Eritrean people with an enabling and empowering environment for the provision of sustainable quality health care that is effective, efficient acceptable, affordable and accessible to all citizens. The mission is “to promote and provide high quality promotive, preventive, curative and rehabilitative health care services to the Eritrean people”. The disease burden in Eritrea as in any other developing country is attributed to infectious diseases, malnutrition and maternal related health problems. These health problems have negative correlation with the socio-economic status of the people. Thus, in societies with better socio-economic status, these health problems have very low occurrences compared to the poor countries.

This variation is also evident in urban and rural societies even within the poor countries. Urban dwellers have relatively better access to basic social services than rural dwellers. Thus higher risk of infectious diseases and malnutrition is evident in rural areas.

Acute respiratory infections (mainly pneumonia), diarrhea, anemia, malnutrition, skin and eye infections, malaria and HIV/AIDS are among the 10 leading causes of morbidity and mortality in the country.

The non-communicable diseases such as hypertension, diabetes, ophthalmic problem, psychiatric problems, and injuries are also emerging health problems in Eritrea.

In 2013 about 63% of the total outpatient morbidity and 43% of total inpatient morbidity was attributed to the top 10 diseases. Similarly over 66 % of inpatient and outpatient mortality among those five and above was attributed to the top ten leading diseases. This means that, reducing the morbidity and mortality of the ten leading causes of illness can decrease the total outpatient and inpatient morbidity and mortality significantly. By preventing only pneumonia and diarrhea, it is possible to reduce child morbidity by above 26%.

In 2013, diarrhea, ARI mainly pneumonia, skin, eye and ear infections, malnutrition, injury of all types and urinary tract infections were the top ten leading causes of outpatient and inpatient morbidity in under-five years of age. Among infants a large portion of the deaths were related to neonatal problems. Congenital malformations were also among the top ten leading causes of deaths in this age group.

1.2.2 Analysis of the overall Health System

Service Delivery

Health services in Eritrea have been provided through a three tier system, which include primary, secondary and tertiary levels of service (figure 5). Primary level of service consists of (i) Community-based health services with coverage of an estimated 2,000 to 3,000 population. This level provides BHCP based services by empowering communities, mobilizing and maximizing resources. The key delivery agent is the Community Health Worker under the leadership of the Village Health Committee. (ii) Health Stations offer facility-based primary health care services to a catchment population of approximately 5,000-10,000. (iii) Community Hospital is the referral facility for the primary health care level of service delivery serving a community of approximately 50,000-100,000 people. Community hospitals provide all services at the lower level facilities and additionally obstetric and general surgical services with the aim of providing vital lifesaving surgical intervention closest to the people.

Secondary level of services is provided by the regional (Zonal) referral hospitals and 2nd contact hospitals. They serve as referral facilities for the lower level facilities as well as teaching/training institutions for middle and operational level professionals and provide facilities for operational/applied research.

Tertiary level of service is provided by the national referral hospitals which are situated in the capital city-Asmara. They not only serve as national referral facilities but as centers of excellence for specialized training/education and research.

In December 2013, 340 health facilities reported to NHMIS including government and non-government health facilities except the Military Health Facilities. The MOH owns 258 (75.9%), Eritrean Catholic Secretariat 30(8.9%), Evangelical Church 3(0.9%), private 8(2.4%), Industry 31(9.2%) and the remaining others 9 (2.8%).

Laboratory Services: Eritrea has three levels of laboratory services located at health centers, hospitals and the central health laboratory. A total of 502,679 laboratory tests were performed in all health facilities in 2013 excluding NHL. Haematology, urinalysis and stool analysis were the most common laboratory tests performed in most health facilities. The NHL performs more complicated tests and serves as a referral laboratories for all health facilities in the country. It has six departments, namely microbiology, haematology, immune-serology, clinical chemistry, histopathology and food and drink department.

Figure 5: Levels of Service delivery

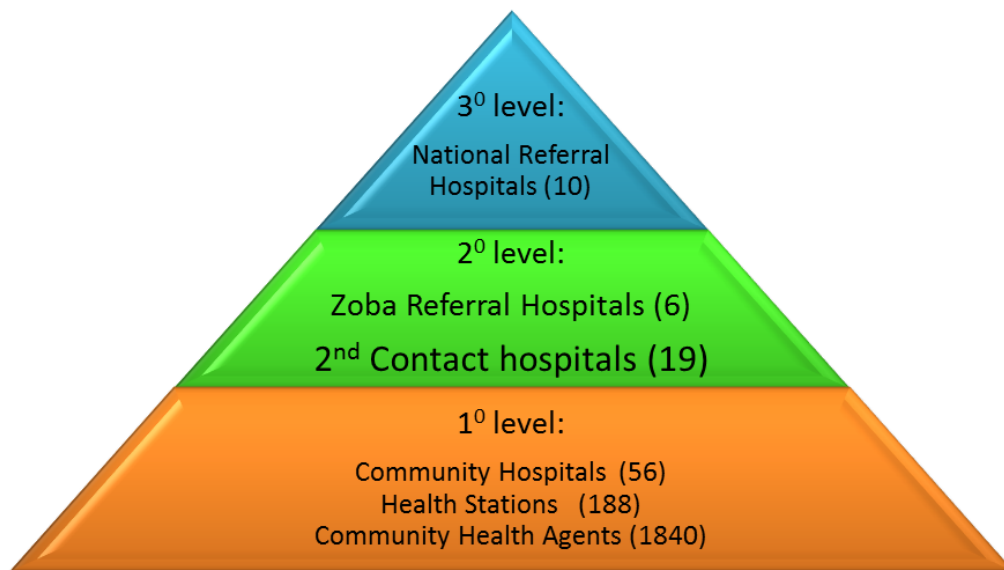
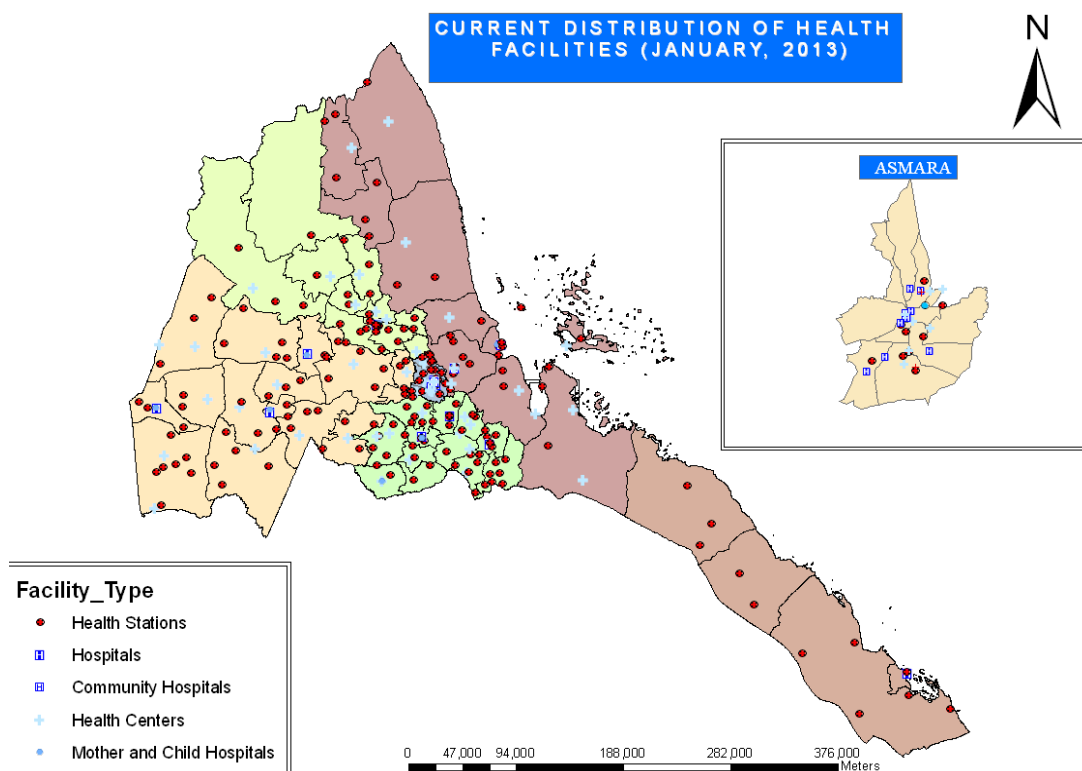


Figure 6: Distribution of Health Facilities in Eritrea



Health Work Force

The total number of clinicians in the country as of December 2013 was: 172 doctors, 1253 nurses, 2727 associate nurses and 397 laboratory technicians (HMIS 2013). The doctors, nurse and associate nurses population ratio in 2013 was 1:23256, 1:3192, 1:1467 respectively indicating that there were 0.43 doctors per 10,000 people, 3.1 nurses and 6.9 associate nurses per 10,000 people. These were staff of the MoH. Considering the WHO minimum health worker requirement per 10,000 people, it will not be long before Eritrea exceeds the

recommended minimum ratio for doctors. Moreover, an average of 30 doctors has graduated every year beginning from 2009. This will significantly reduce the ratio. The minimum requirement for nurses and associate nurses is already achieved. The WHO recommended target for developing countries in the doctor population and nurse population ratio is 1:10,000 and 1:5,000 respectively. In addition to this other paramedical health professional population ratio shows radiology technicians 1:48,750, pharmacist and pharmacy technicians 1:13,514, sanitarians 1:164,785, laboratory scientists (MLT+CLS) 1:10,076, public health technologist 1:48,684, and other health professionals (oph. Tech + dental + physio.) 1:33,945. Among those actively working in the health facilities, 2191 (59.7%) were working in hospitals, 666 (18.2%) in health centers, 593 (16.2%) in health stations, 541(5%) in Mother and Child Health Clinics and 166(4.5%) in other clinics, indicating that only one third of the health workers work in primary health facility settings. However, it is also absolutely important to focus attention to primary level care in health center and health stations as most of the health problems in Eritrea are easily preventable and could be handled in those health facilities. These facilities are also found within short distance from the villages compared to the hospitals as a result they are the first entry point to health services. The proportion of health workers deployed to Zobas usually depends on the number of health facilities in the Zoba which also depend on the number of residents in the Zoba. Access to basic health services within 5 km radius is 60% (HHSDP, 2012-2016). The challenges faced by the NTD program include shortage of budget, man power, and poor awareness among the people. There is no NTD policy.

Health Information

The Ministry of Health developed the Health Management Information System (HMIS) in 1997 and selected disease and health service indicators through the participation of health workers and concerned partners and stakeholders. A total of 320 HF are reporting on a monthly basis data from 22 program activities. Data collection manual was developed and health workers were trained on the use of the data collection and reporting tools. At the initial establishment of the HMIS, the computerized system was developed on Dos-based access operating system and the data entry at Zoba level started in February 1998. The reported data can be disaggregated by Zoba, Sub-Zoba and facility levels. The outpatient and inpatient morbidity and mortality report used to be disaggregated by two age categories (under 5 (U5) and above 5) until the third category (<1) was included in 2004. The reports from Zobas to the national HMIS office are sent in flashes and CDs. Close monitoring of the timely reception of the data is conducted at central level and all data is received within 20 days of the following month. The system is working with high efficacy, timeliness and in an integrated approach. The implementation of the disease surveillance and response (IDSR), which has integrated reporting of 19 priority communicable diseases in the country, was done in 2002.

Medical products

The National Medicine and Food Administration (NMFA) is the primary regulatory body in charge of control of drug quality and standards in Eritrea. As a regulatory and administrative body, of the Ministry of Health, for drugs and other medical supplies, NMFA regulates the quality of pharmaceuticals and medical supplies that are imported, and those that are produced in the country. This is to ensure that pharmaceutical products conform to acceptable standards of quality, safety, and efficacy before they are registered.

There is a centralised procurement, supply storage, and distribution system in place for medical products in the country which ensure standardization. The sector has also aimed at developing a harmonized, sustainable and efficient procurement and supplies management system through the establishment of PHARMECOR - Eritrea. Pharmaceutical sub-sector

management is guided by the National Medicines Policy under the stewardship role of the division of medicines and medical supplies of MOH.

PHARMECOR plans and procures once a year for supplies funded by government and items that are included in the “Essential medical list” which is regularly revised, and approximately 3 times a year for externally funded supplies to respond to program specific requirements including that for NTDs using appropriate internationally acceptable tendering procedures.

The NMFA ensures a patient-focused service by introducing a functional pharmaceutical care at all levels of service by establishing standard formulary and procedures for use in all hospitals and primary level health facilities, regulate and control advertisement of drugs, medical supplies and health services in the mass media.

Each zone has adequately equipped medical store with staff that include a chief pharmacist. Zonal and hospitals stores requisition quantified supplies on a “pull-basis” determined by facility/zonal budgetary ceiling. The orders are filled by PHARMECOR and collected by zonal stores for health stations and health centers and separately by hospitals. Zones pay directly for received items to PHARMECOR, and when a justified need arises to requisition beyond the set budgetary ceiling, MOH absorbs the difference in expenditure.

Each unit in the MOH is responsible for tracking the ADRs that occur within its mandate. Similarly, pharmacovigilance for NTD related adverse drug reactions (ADR) will be the role of the NTD Program (CDC division) of the MOH in collaboration with the NMFA. Forms will be adapted from WHO for tracking and reporting ADRs related to NTD drugs.

Health Financing

In early 2002, MOH updated the financial policy, the roles and likely levels of financing from the government, donors and the people. The new policy proposed that health facilities retain a fraction of the revenues collected for maintenance purposes. Government expenditures on health as a percentage of total government expenditures was 4.5% for the period 1995-2000. The share of external resources to total health expenditures in the country grew appreciably between 1995 (33%) and 2000 (61%). The per capita total expenditure on health grew from US\$ 6 in 1995 to US\$ 9 in the year 2000. Information on the government expenditure pattern for MOH in 2002 revealed that around 50% of the total budget was allocated to hospitals and only 16% for PHC activities, an issue which needs to be addressed in the health sector reform programme (MOH 2003).

The government will be responsible for the implementation of the NTDs. Moreover, with the completion of the master plan extensive resource mobilization will be conducted and partner interest in funding the NTDs is expected to grow in the coming years.

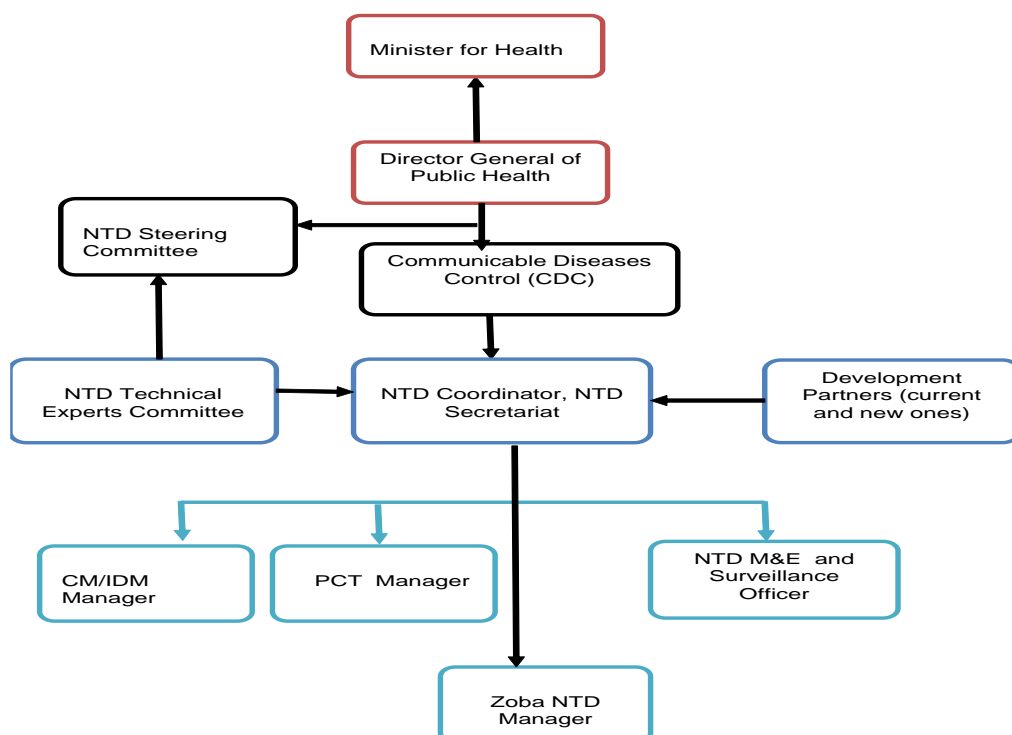
Leadership and Governance

The Government of Eritrea accords health a prominent place in its priorities and it is committed to the attainment of health goals. In particular, the Government fully appreciates and continuously emphasizes the decisive role of the people in the development and self-reliance. The Government is, therefore, determined to create the requisite social and political conditions conducive to their realization. The ministry is highly committed in the control of communicable disease and to that extent has developed the 5 year health sector strategic development plan with communicable diseases being priorities in the coming years.

Recent restructuring in the health system have involved the inclusion of a Neglected Tropical Diseases Unit within the Division of Communicable Diseases (CDC) within the Department of Public Health. (See Annex 1.3, Ministry of Health Organogram). Even though NTDs do not feature among the top 10 priority diseases, existing conditions within the current health

system are supportive of plans to scale up PCT and CM-IDM in the country (Figure 7). An NTD structure has also been established.

Figure 7: Proposed NTD Organogram



A multi-sectoral approach is maintained especially with the Ministry of Education, Ministry of water and land, Ministry of Local Government, Ministry of Agriculture (where Department of Veterinary Services is embedded) and Local NGOs. Within this framework, inclusion of NTD control in the primary school curriculum will be established, as well as activities relating to zoonotic diseases of public health importance in the country e.g. Rabies.

1.3 NTD Situation Analysis

The World Health Organization (WHO) estimated that in 2007 at least 1 billion people – one sixth of the world's population, or 1 person in 6 – suffer from one or more of the Neglected Tropical Diseases (NTDs) such as Schistosomiasis, Soil transmitted Helminths, Lymphatic filariasis, Trachoma, trypanosomiasis, cystercosis, onchocerciasis, Buruli ulcer, dracunculiasis (guinea-worm disease) foodborne trematode infections (such as fascioliasis) hydatidosis, and leishmaniasis. Several of these diseases, and others such as dengue, are vector-borne. These diseases are referred to as Neglected Tropical Diseases, as their burden in endemic countries is high but disproportionate to the resources allocated for their control, they also almost exclusively affect almost poor and under-served communities. Although safe and cost-effective interventions for prevention and control are available, these diseases have continued to cause immense suffering and often life-long disabilities for the rural poor due to neglect.

The Neglected tropical diseases, all of them communicable, are therefore not receiving as much attention as the high profile diseases such as malaria, HIV/AIDS and TB (WHO, 2006).

The major known NTDs are:

- A group of about 13 infectious diseases which affect about 1 billion people worldwide and most of whom live in extreme poverty
- Burdened humanity for centuries
- Severely debilitating and disabling
- Associated with poverty and intense stigma and
- Promote the cycle of poverty

The known types of NTDs in Eritrea are:

1. Preventive chemotherapy NTDS (PCT-NTDs)

1. Schistosomiasis (SCH)
2. Soil transmitted Helminthiasis (STH)
3. Trachoma (TRA)
4. Lymphatic Filariasis (LF)

2. Intensified Disease management NTDS (IDM-NTDs)

1. Leprosy (LEP)
2. Leishmaniasis (LEISH)
3. Dengue Fever (DF)
4. Rabies
5. Brucellosis
6. Anthrax

1.3.1 Epidemiology and burden of disease

The main health care packages fall under the Department of Public Health and include the following:

- a) Communicable Disease Control Division which embraces of Malaria control, HIV/AIDS/STI Control, TB Control, NTD Control and Integrated Disease Surveillance and Response programs,
- b) Family and Community Health Division: embraces of Family and Reproductive Health, Child and Adolescent Health, EPI, Nutrition,
- c) Non-Communicable Disease Control Division: embraces Blindness prevention, Ear and Orodontal diseases control among others
- d) Environmental Health Division

The top ten leading causes of outpatient and inpatient morbidity alone constitutes to about 90% of the total causes of morbidity and 88 -90% of all causes of mortality in children under five. Similarly, about 60% of the total outpatient morbidity, 40 % of the total inpatient morbidity and 60 % of inpatient mortality in five and above age group.

In 2013, diarrhea, ARI mainly pneumonia, skin, eye and ear infections, malnutrition, injury all types, soft tissue injury and other urinary tract infection are the top ten leading causes of outpatient and inpatient morbidity in under-five years of age. In five and above age group, ARI, ORO-dental infection, gastritis/ulcer, urinary tract infection and Injury all types were the top five causes of morbidity in OPD. (Source: MOH, HMIS, 2013).

The status of NTD endemicity is discussed below Figure 7: Prevalence of *S. mansoni* in Eritrea by Zoba, 2015

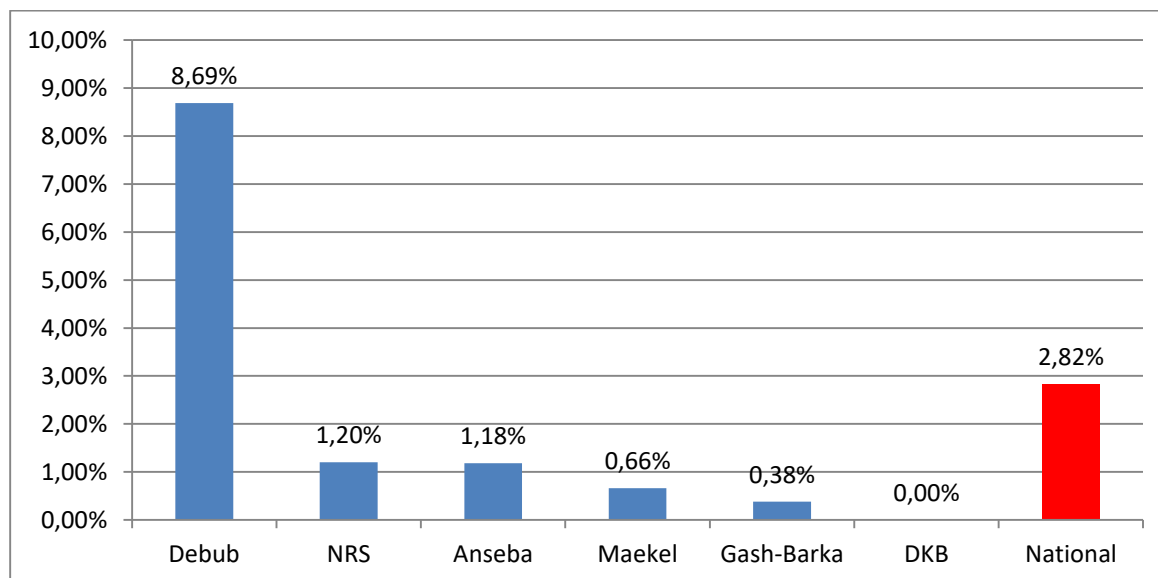
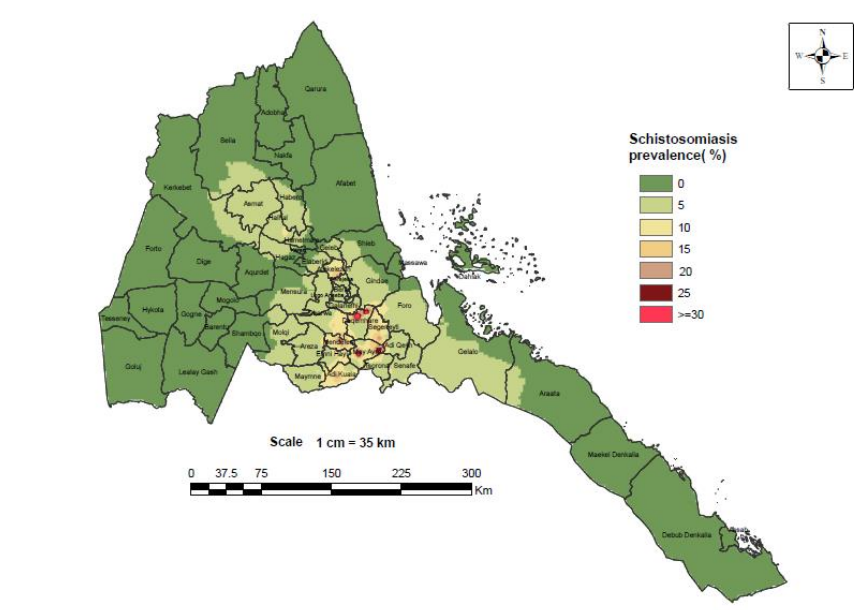


Figure 8: Predicted Map of *S. mansoni* infection



Out of the total 58 sub zobas in the country, schistosomiasis was found only in 28 sub zobas. In the sub zobas with *S. mansoni* infection, prevalence ranged from 0.17% in Goluj to 15.35% in Dekemhare subzoba. *S. mansoni* infection was found in all the sub zobas of Debub. Top six sub zobas with the highest prevalence were Dekemhare (15.35%), Maiaini (15.22%), Adi-Tekelezan (15.21%), Adiquala (12.1%), Molqi (10.25%) and Dbarwa (9.48%) with four of them from Debub zoba. Segeneiti, Mendefera, Emnihaili, Ghindae, Halhal, Senafe and Adikeih follow with rates of 8.02%, 7.25%, 5.35%, 4.9%, 4.63%, 4.4% and 4.39% respectively [See

Table 2, Figure 9 and Table 3].

Table 2: Distribution of *S. mansoni* infection by subzoba

	Sub zoba	Zoba	Prevalence of <i>S. mansoni</i>	Number of Students
1	Dekemhare	Debub	15.35	480
2	Maiaini	Debub	15.22	260
3	Adi-Tekelezan	Anseba	15.21	283
4	Adiquala	Debub	12.10	251
5	Molqui	Gash Barka	10.25	335
6	Dbarwa	Debub	9.48	454
7	Segeniti	Debub	8.02	197
8	Mendefera	Debub	7.25	402
9	Imnihaili	Debub	5.35	352
10	Ghindae	SKB	4.90	507
11	Halhal	Anseba	4.63	279
12	Senafe	Debub	4.40	403
13	Adikeih	Debub	4.39	483
14	Maimine	Debub	1.72	352
15	Tsorona	Debub	1.51	370
16	Areza	Debub	1.47	501
17	Serejeka	Maakel	1.26	273
18	Gaa-Nefhi	Maakel	1.18	253
19	Massawa	SKB	1.04	450
20	Berik	Maakel	1.04	255
21	Semenawi-me'rab	Maakel	0.86	226
22	Foro	Gash Barka	0.74	250
23	Logo-Anseba	Gash Barka	0.71	448

24	Sheib	SKB	0.67	324
25	Haykota	Gash Barka	0.20	210
26	Forto	Gash Barka	0.19	218
27	Debubawi Mbrak	Maakel	0.18	275
28	Goluj	Gash Barka	0.17	279

Figure 9: Prevalence map S mansoni by Sub zoba

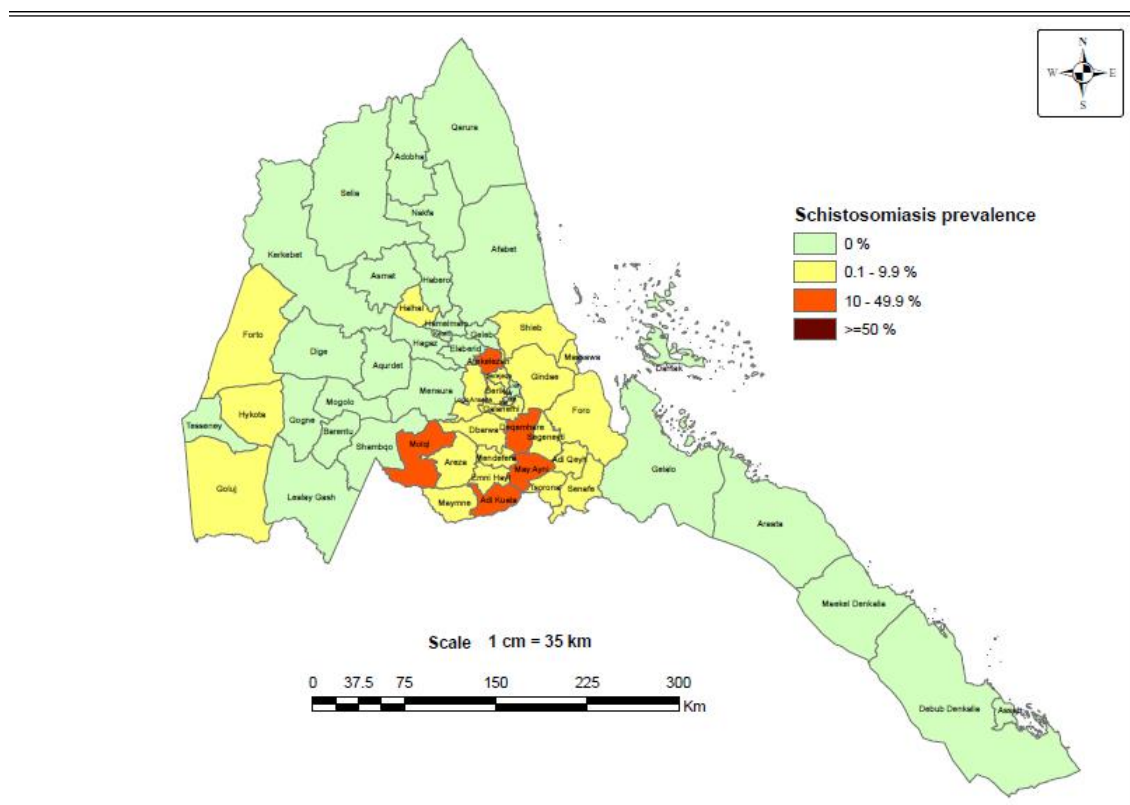


Table 3: Sub zobas without *S. mansoni* infection

S. No	Sub zoba/Zoba	Prevalence of <i>S. mansoni</i>	Number of Students
	Anseba		
1	Hagaz	0.00	279
2	Asmat	0.00	280
3	Elaberd	0.00	239
4	Geleb	0.00	285
5	Habero	0.00	263
6	Hamelmalo	0.00	275
7	Keren	0.00	281
8	Kerkebet	0.00	196
9	Selea	0.00	199
	DKB		
10	Areata	0.00	188
11	Assab	0.00	262
12	Debub denkalya	0.00	238
13	Maakel denkel	0.00	254
	Gash Barka		
14	Aquordet	0.00	491
15	Barentu	0.00	540
16	Dighe	0.00	254
17	Gogne	0.00	421
18	Lelay Gash	0.00	265
19	Mensura	0.00	384
20	Mogolo	0.00	255
21	Shambuko	0.00	523
22	Tessenei	0.00	555

	Maakel		
23	Debubawi-me'rab	0.00	260
24	Semenawi-mibrak	0.00	251
	SKB		
25	Adobha	0.00	104
26	Afabet	0.00	260
27	Gel'alo	0.00	211
28	Karura	0.00	281
29	Nakfa	0.00	277
30	Dahlak	0.00	134

4.2.2 Prevalence of *S. mansoni* by age and sex

Schistosomiasis prevalence increased with an increasing age ranging from 1.90% [1.5%, 4.8%] among those who are 10 years of age to 6.99% [4.9%, 22.3%] among the 14 year olds. The proportion of children infected was higher among the males 4.28% [3.8%, 10.3%] than their females counterparts 1.24% [1.2%, 4.1%] and the difference was statistically significant ($\chi^2 = 90.063$, $p = 0.000 < 0.001$) [Table 4].

Table 4: Percentage of children age 10-14 infected with *S. mansoni* by age and sex

Age and sex	%	Number of Children
Age		
10	1.90	5567
11	2.35	4057
12	2.73	4048
13	2.68	2588
14	6.99	1815
Sex		
Male	4.28	9373
Female	1.24	8702
Total	2.82	18075

4.2.3 Prevalence of *S. mansoni* by schools

Ninety one out of the 344 schools selected for the survey have at least one school child infected with *S. mansoni*. Of these, the highest infection rate (43.76%) was recorded in Halibo Elementary School in sub-zoba Dekemhare. This was followed by Meadin Elementary & Junior, Kinafina Elementary and Warsay junior with prevalence of 34.92%, 31.56% & 31.56%, respectively. The lowest prevalence (1.24%) was in Adi Nebri elementary and junior school of sub-zoba Maiani.

According to the WHO risk level classification, based on prevalence of infection, 20 of the investigated schools were located in medium-risk areas of *S. mansoni* infection with prevalence ranging between 10% and 50% [Table 5]. Sixty eight schools were located in low-risk areas with prevalence between 1% and 10%). In the remaining schools none of the children were infected with *S. mansoni*. See **Error! Reference source not found.** for details.

Table 5: Schools in medium-risk areas of *S. mansoni* infection

Name of School	%	Number of Students
Halibo Elementary	43.76	52
Meadin Elementary & Junior	34.92	55
Warsay Junior	31.56	56
Kinafina Elementary	31.56	54
Quaetit Elementary	27.86	53
Mihiram Geido Elementary	26.98	50
Embakakat Elementary & Junior	22.92	52
M.Tsion Hebo Elementary & Junior	21.73	37
Bana Harnet Elementary	19.59	57
Kudo Felasi Elementary	19.50	51
Mai Gume Elementary & Junior	18.26	50
Tsinat Elementary & Junior	16.01	57
Ibrahim Afa Ele & Junior	15.54	56
Shekawedibsrat Elementary & Junior	14.00	50
Kidanemhret Elementary	13.76	56
Shketi Elementary & Junior	12.91	53
Adi-Wisk Elementary	12.60	56
Petros Paulos A Elementary	12.43	52
Mendefera Junior	11.50	50
Zara Junior	10.17	51

4.3 Prevalence of *S. Haematobium*

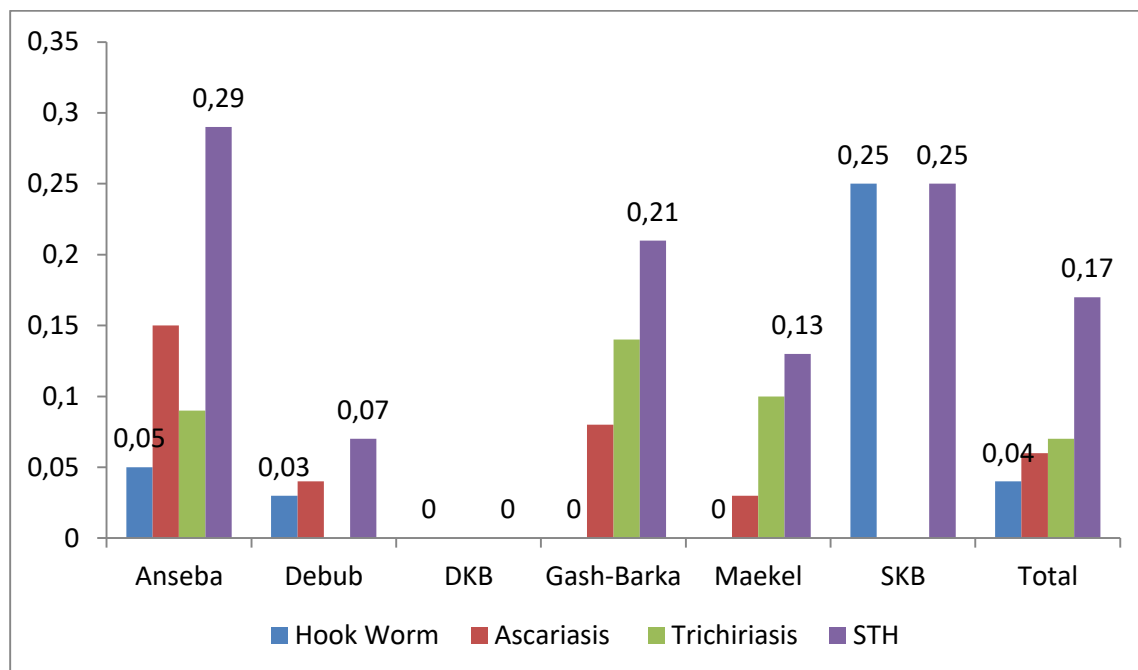
S. haematobium was found in only two school boys aged 12 & 13 years out of 257 tested making the overall prevalence of *Schistosoma haematobium* infection in the Goluj subzone of 0.78%. The two students are from the same school and they had also high intensity of infection.

Prevalence of Soil-transmitted helminth

4.4.1 Prevalence of Soil-transmitted helminth by zoba and sub-zoba

In this survey, the overall prevalence of any STH in children age 10-14 years was 0.17. Relatively high prevalence (0.29%) was recorded in Anseba followed by SKB (0.25%) and Gash Barka (0.21%). This study also revealed that none of the children examined were positive for any STH in DKB. Hook worm infection was also absent in Gash Barka & Maekel. *T. Trichuria* was not found in Debub and SKB [Figure 10].

Figure 10: Distribution & type of STH Infection by Zoba



The findings showed STH to be prevalent in 20 out of the 58 sub zobas with Sub zoba comparison showing Halhal to have the highest prevalence (1.57%) followed by Aqordat (1.2%) and Ghindae (1%). The remaining 17 sub zobas had prevalence rates ranging in between 0.87% and 0.06%. Hook Worm occurred in six sub zobas namely Halhal, Ghindae, Massawa, Shieb and Senafe while Ascariasis and Trichuriasis occurred in nine and eight sub zobas respectively [see Table 6 and Figure 11]. Three sub zobas, namely Hagaz, Logo-Anseba and Adikeih had two types of STH namely Ascariasis and Trichuriasis, while Dbarwa had Hook Worm and Ascariasis. For list of sub zobas without any STH, please refer **Error! Reference source not found.**

Table 6: Distribution of Soil-transmitted helminth by type, according to sub-zoba

S. No.	Sub zobas	Hook Worm	Ascariasis	Trichuriasis	STH	Number of Students
1	Halhal	1.57	0.00	0.00	1.57	279
2	Aquordet	0.00	0.00	1.20	1.20	491

3	Ghindae	1.00	0.00	0.00	1.00	507
4	Hagaz	0.00	0.47	0.40	0.87	279
5	Mensura	0.00	0.00	0.66	0.66	384
6	Logo-Anseba	0.00	0.32	0.32	0.64	448
7	Adikeih	0.00	0.48	0.00	0.48	483
8	Gogne	0.00	0.00	0.48	0.48	421
9	Debubawi Mbrak	0.00	0.00	0.46	0.46	275
10	Habero	0.00	0.44	0.00	0.44	263
11	Selea	0.00	0.34	0.00	0.34	199
12	Berik	0.00	0.34	0.00	0.34	255
13	Massawa	0.30	0.00	0.00	0.30	450
14	Sheib	0.25	0.00	0.00	0.25	324
15	Adi-Tekelezan	0.00	0.23	0.00	0.23	283
16	Senafe	0.23	0.00	0.00	0.23	403
17	Keren	0.00	0.11	0.09	0.21	281
18	Goluj	0.00	0.17	0.00	0.17	279
19	Molqui	0.00	0.00	0.15	0.15	335
20	Dbarwa	0.04	0.02	0.00	0.06	454

STH prevalence

- 0 %
- 0.1- 9.9 %
- 10 - 49.9 %
- ≥50 %

Scale 1 cm = 35 km

0 37.5 75 150 225 300 Km

As indicated in Table 7, there is no significant variation in the prevalence of any STH between boys and girls ($\chi^2=0.037$, $p=0.847>0.05$). The proportion of children infected with any STH species generally tends to increase with an increasing age, but the difference was not statistically significant ($\chi^2=22.52$, $p=0.274>0.05$). The overall age and sex pattern of the prevalence of infection with any STH also holds true for the different species of STH.

Table 7: Distribution of STH by type, age and sex

Age and Sex	Hook Worm	Ascaris Lumbricoides	Trichuris Trichiura	Any Transmitted Soil helminth (STH)	Number of Students
Age					
10	.02	.09	.02	.13	5567
11	.09	.03	.07	.19	4057
12	.02	.04	.03	.09	4048
13	.03	.09	.12	.24	2588
14	.03	.04	.25	.32	1815
Sex					
Male	.06	.05	.12	.23	9373
Female	.02	.06	.02	.10	8702
Total	0.04	0.06	0.07	0.17	18075

4.4.3 Prevalence of Soil-transmitted helminth by schools

STH was prevalent in 31 schools out of 345 surveyed schools. Abdella Degol Elementary, Alnejah Elementary & Junior, Gerger Elementary & Junior, Erdi Elementary & Junior and Alnahda Elementary schools had the highest prevalence rates of 10.03%, 9.37%, 6.73%, 5.26% and 5.12%, respectively. The remaining 21 schools have prevalence in the range of 4.13% and 0.22%. Hook Worm was prevalent in 10 schools, Ascariasis in 11 schools and Trichiriasis in 10 schools [

Table 8: Prevalence of STH by schools].

According to the WHO standard classification¹ on the risk level of infection, based on the prevalence of infection with any STH, none of the schools were located in low or high risk areas. The presence of STH in scattered places indicates that STH infection is almost insignificant as a public health problem in Eritrea. See **Error! Reference source not found..**

¹WHO standard classification of risk level of infection with any STH: Schools in high-risk areas (Prevalence \geq 50%); Schools in low-risk areas (Prevalence \geq 20% and $>50\%$).

Table 8: Prevalence of STH by schools

S. No.	Name of school	Hoowk Worm	Ascariasis	Trichiriasis	STH	Number of Students
1	Abdella Degol Elementary	10.03	0.00	0.00	10.03	56
2	Alnejah Elementary&Junior	0.00	0.00	9.37	9.37	49
3	Gerger Elementary&Junior	0.00	0.00	6.73	6.73	50
4	Erdi Elementary & Junior	0.00	0.00	5.26	5.26	49
5	Alnahda Elementary	0.00	0.00	5.12	5.12	56
6	ferdigi Elementary&Junior	0.00	0.00	4.13	4.13	56
7	Seid Ferej Elementary	4.03	0.00	0.00	4.03	54
8	ahune elementary school	0.00	3.56	0.00	3.56	56
9	Takawda Elementary	0.00	0.00	2.92	2.92	56
10	Dongolo Tahtay Elementary & Junior	2.53	0.00	0.00	2.53	44
11	Senafe Elementary	2.50	0.00	0.00	2.50	56
12	Hirkuk Elementary & Junior	0.00	0.00	2.40	2.40	95
13	Shid M/Seid Shemsi Elementary	2.23	0.00	0.00	2.23	50
14	Fre Selam Elementary&Junior	0.00	0.00	2.02	2.02	50
15	Faith mission Elementary&Junior	0.00	0.00	1.98	1.98	52
16	Lemlem Seti Elementary	0.00	1.97	0.00	1.97	100
17	Rekeb Elementary&Junior	0.00	1.88	0.00	1.88	56
18	Felega elementary	0.00	1.85	0.00	1.85	50
19	Mai Habar Elementary& Junior	1.83	0.00	0.00	1.83	56
20	Tala Elementary	1.83	0.00	0.00	1.83	50
21	Torat Elementary	0.00	1.81	0.00	1.81	50
22	Mohammed Idrisi Elementary&Junior	0.00	1.74	0.00	1.74	56
23	Aditekelezan Elementary&Junior	0.00	1.67	0.00	1.67	56
24	Anseba Islamic	0.00	1.60	0.00	1.60	57

	Elementary&Junior					
25	Embakakat Elementary&Junior	0.00	1.58	0.00	1.58	52
26	Salih Meki Elementary& Junior	1.56	0.00	0.00	1.56	56
27	kidane Mihret H Elementary&Junior	0.00	1.34	0.00	1.34	56
28	Jehan Elementary&Junior	0.00	0.00	1.15	1.15	56
29	Emberami Elementary &Junior	1.12	0.00	0.00	1.12	100
30	Ibrahim Afa Elementary& Junior	0.86	0.00	0.00	0.86	56
31	Darelneem Elementary	0.00	0.22	0.00	0.22	56

4.5 Co-infection of *S. mansoni* and any Soil-transmitted helminth

Co-infection of *S. mansoni* and any Soil-transmitted helminth was not common among the school children. Only 11 of the children participated in the parasitological survey were found to be infected with both *S. mansoni* and any Soil-transmitted helminth. Ten of these students were residents of zoba Debub and the 1 was from Zoba Anseba.

4.6 Intensity of Infection of *S. mansoni*

The survey also estimated the intensity of infection with the parasites for each child based on the count of eggs per gram of faeces (epg). WHO standard classification [

Table 9: Classification of intensity of infection for soil-transmitted helminths and schistosomiasis] is used to identify the level of intensity of infection of each child. Classification of the results into the classes of intensity allows an immediate assessment of the proportion of individuals suffering from the severe consequences of the infection and therefore, of the public health relevance of the infections in the community. Following the recommendation by WHO, proportion of children falling in each classe is taken to measure and present the intensity of infection.

Table 9: Classification of intensity of infection for soil-transmitted helminths and schistosomiasis

Parasite	Light-intensity Infections**	Moderate-intensity infections** of	Heavy-intensity of infections
A. lumbricoides	1-4,999 epg	5,000-49,999 epg	≥ 50,000 epg
T. trichiura	1-9,99 epg	1,000-9,999 epg	≥ 10,000 epg
Hookworms	1-1,999 epg	2,000-3,999 epg	≥ 4,000 epg
S.mansoni	1-99 epg	100-399 epg	≥ 400 epg
S. haematobium	1-50 eggs/10ml of urine		>50 epgs/10ml of urine (or visible haematuria)

*WHO 2002

**epg=eggs per gram of faeces

4.6.1 Intensity of Infection of *S. mansoni* by zoba and sub-zoba

As indicated above, the overall prevalence of *S. mansoni* in children 10-14years age in the country is 2.82% [1.8%, 4.5%]. Majority of these children have light intensity infection 1.28% [0.9%, 1.9%]. The rate of moderate and heavy intensity of infections in these children is 0.8% [0.4%, 1.6%] and 0.74% [0.3%, 2.0%], respectively [Table 10].

The intensity of infections for *S. mansoni* is much higher in Zoba Debub compared to the other four zobas. The presence of heavy intensity *S.mansoni* infection is 2.69% [1.1%, 6.4%] among children in Zoba Debub, compared with only below 0.2% among those in zobas SKB(0.18%), Anseba (0.04%), Gash Barka (0.01%), and Maekel (0%). The variation in the intensity of infection between zobas is strongly significant ($\chi^2 = 834.248$, $p=0.000 < 0.001$).

Table 10: Percentage of children by intensity of infection of SCH, according to zoba and sub-zoba

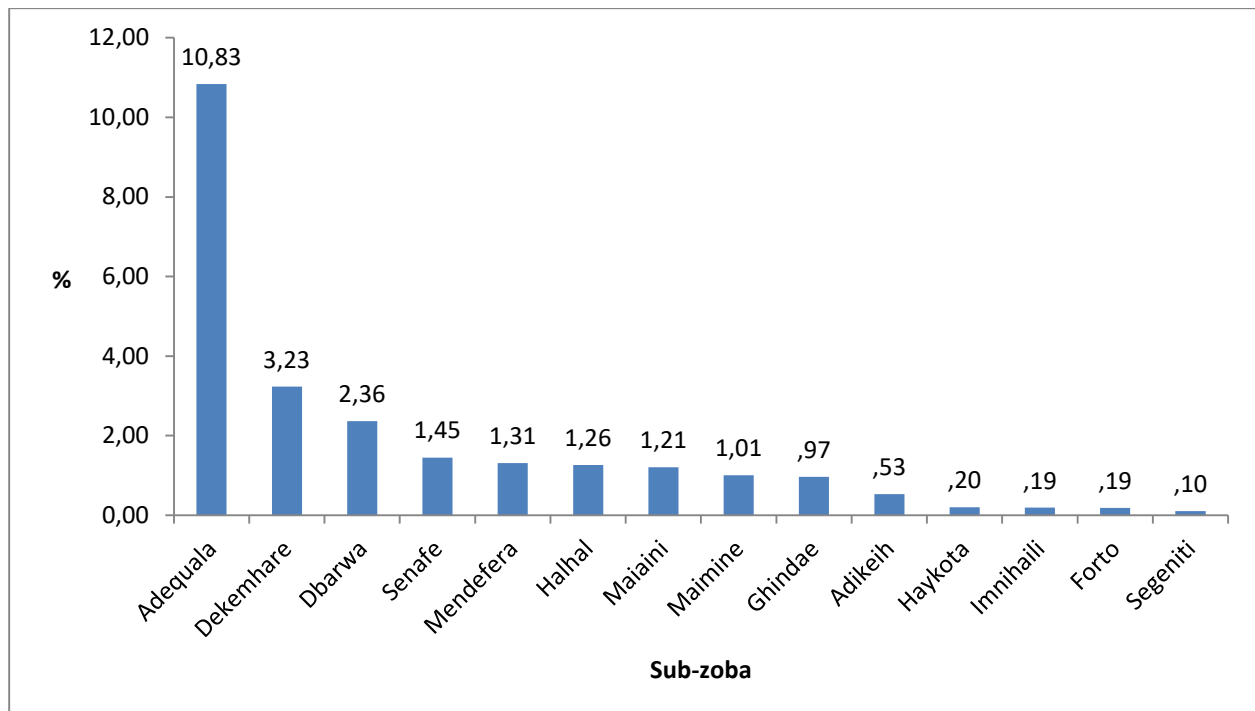
Zoba and sub-zoba	No infection	Light infection	Moderate Infection	Heavy Infection	Total	No. of students
Hagaz	100.00	0.00	0.00	0.00	100.00	279
Adi-Tekelezan	84.79	12.27	2.94	0.00	100.00	283
Asmat	100.00	0.00	0.00	0.00	100.00	280
Elaberda	100.00	0.00	0.00	0.00	100.00	239
Geleb	100.00	0.00	0.00	0.00	100.00	285
Habero	100.00	0.00	0.00	0.00	100.00	263
Halhal	95.37	2.48	.89	1.26	100.00	279
Hamelmalo	100.00	0.00	0.00	0.00	100.00	275
Keren	100.00	0.00	0.00	0.00	100.00	281
Kerkebet	100.00	0.00	0.00	0.00	100.00	196
Selea	100.00	0.00	0.00	0.00	100.00	199
Anseba	98.83	.90	.23	.04	100.00	2859
Adequala	87.90	.84	.42	10.83	100.00	251
Adikeih	95.61	2.33	1.53	.53	100.00	483
Areza	98.53	1.27	.20	0.00	100.00	501
Dbarwa	90.52	5.16	1.96	2.36	100.00	454
Dekemhare	84.65	4.57	7.55	3.23	100.00	480
Imnihaili	94.65	3.68	1.49	.19	100.00	352
Maiaini	84.78	7.09	6.92	1.21	100.00	260
Maimine	98.28	.71	0.00	1.01	100.00	352
Mendefera	92.75	4.64	1.30	1.31	100.00	402
Segeniti	91.98	4.15	3.77	.10	100.00	197
Senafe	95.60	2.69	.26	1.45	100.00	403
Tsorona	98.49	.82	.69	0.00	100.00	370
Debub	91.32	3.42	2.58	2.69	100.00	4505
Areata	100.00	0.00	0.00	0.00	100.00	188

Assab	100.00	0.00	0.00	0.00	100.00	262
Debub denkalya	100.00	0.00	0.00	0.00	100.00	238
Maakel denkel	100.00	0.00	0.00	0.00	100.00	254
DKB	100.00	0.00	0.00	0.00	100.00	942
Aquordet	100.00	0.00	0.00	0.00	100.00	491
Barentu	100.00	0.00	0.00	0.00	100.00	540
Dighe	100.00	0.00	0.00	0.00	100.00	254
Forto	99.81	0.00	0.00	.19	100.00	218
Gogne	100.00	0.00	0.00	0.00	100.00	421
Goluj	99.83	.17	0.00	0.00	100.00	279
Haykota	99.80	0.00	0.00	.20	100.00	210
Lelay Gash	100.00	0.00	0.00	0.00	100.00	265
Logo-Anseba	99.29	.71	0.00	0.00	100.00	448
Mensura	100.00	0.00	0.00	0.00	100.00	384
Mogolo	100.00	0.00	0.00	0.00	100.00	255
Molqui	89.75	6.89	3.36	0.00	100.00	335
Shambuko	100.00	0.00	0.00	0.00	100.00	523
Tessenei	100.00	0.00	0.00	0.00	100.00	555
Gash-Barka	99.62	0.28	0.09	0.01	100.00	5178
Berik	98.96	.64	.39	0.00	100.00	255
Debubawi Mbrak	99.82	.18	0.00	0.00	100.00	275
Debubawi-me'rab	100.00	0.00	0.00	0.00	100.00	260
Gaa-Nefhi	98.82	1.18	0.00	0.00	100.00	253
Semenawi-me'rab	99.14	.86	0.00	0.00	100.00	226
Semenawi-mibrak	100.00	0.00	0.00	0.00	100.00	251
Serejeka	98.74	.80	.46	0.00	100.00	273
Maakel	99.35	0.58	0.08	0.00	100.00	1793
Adobha	100.00	0.00	0.00	0.00	100.00	104

Afabet	100.00	0.00	0.00	0.00	100.00	260
Foro	99.26	.74	0.00	0.00	100.00	250
Gel'alo	100.00	0.00	0.00	0.00	100.00	211
Ghindae	95.10	2.32	1.62	.97	100.00	507
Karura	100.00	0.00	0.00	0.00	100.00	281
Massawa	98.96	.56	.48	0.00	100.00	450
Nakfa	100.00	0.00	0.00	0.00	100.00	277
Sheib	99.33	.59	.08	0.00	100.00	324
Dahlak	100.00	0.00	0.00	0.00	100.00	134
SKB	98.81	0.65	0.37	0.18	100.00	2798
Total	97.18	1.28	.80	.74	100.00	18075

In the majority of the infected students, the intensity of infection of *S. mansoni* was light in all sub-zobas. Since the first objective of any control programme is to reduce the proportion of heavily infected individuals, the proportion of children with heavy intensity of infection of SCH is extremely important for monitoring the progress of the programme. With the exception of sub-zobas Areza and Tsorona, all of the sub-zobas in Zoba Debub had at least one child with heavy intensity *S. mansoni* infection. The subzobas with high intensity of infection, Adequala, Dekemhare, Dbarwa, Senafe and Mendefera were located in Zoba Debub. In sub-zoba Adequala, the overwhelming majority of the infected children have heavy intensity of infection with prevalence of 10.83% [4.7%, 23.1%]. Sub-zobas Dekemhare, Dbarwa and Senafe also have higher proportion of children with heavy intensity of infection of 3.23%, 2.36% and 1.45%, respectively [Figure 12: Sub zobas with high intensity infections of SCH]. Sub-zoba Dekemhare and Maini have higher proportion of children with moderate intensity of infection with 7.55% and 6.92%, respectively. There is significant relationship between sub-zobas and intensity of infections of schistosomiasis ($\chi^2 = 1346.467$, $p = 0.000 < 0.001$). See Error! Reference source not found. for details.

Figure 12: Sub zobas with high intensity infections of SCH



4.6.2 Intensity of Infection of *S. mansoni* by age and sex

Generally, older children are more likely to have moderate and heavy intensity of infection compared to younger children. Whereas 2.46%, 2.26% and 2.27% of children who are 14 years of age have light, moderate and heavy intensity of infections respectively, the corresponding figures for 10 years old children are only 1.42%, 0.27% and 0.20% respectively. Age is found to have significant relationship with the intensity of infection ($\chi^2 = 141.030$, $p = 0.000 < 0.001$).

The intensity of infection of *S. mansoni* is significantly higher among males than females ($\chi^2 = 152.096$, $p = 0.000 < 0.001$). Proportion of boys with light, moderate and heavy intensity of infections are estimated at 1.93%, 1.28% and 1.07%, respectively, compared with 0.58%, 0.27% and 0.40% among girls [Table 11].

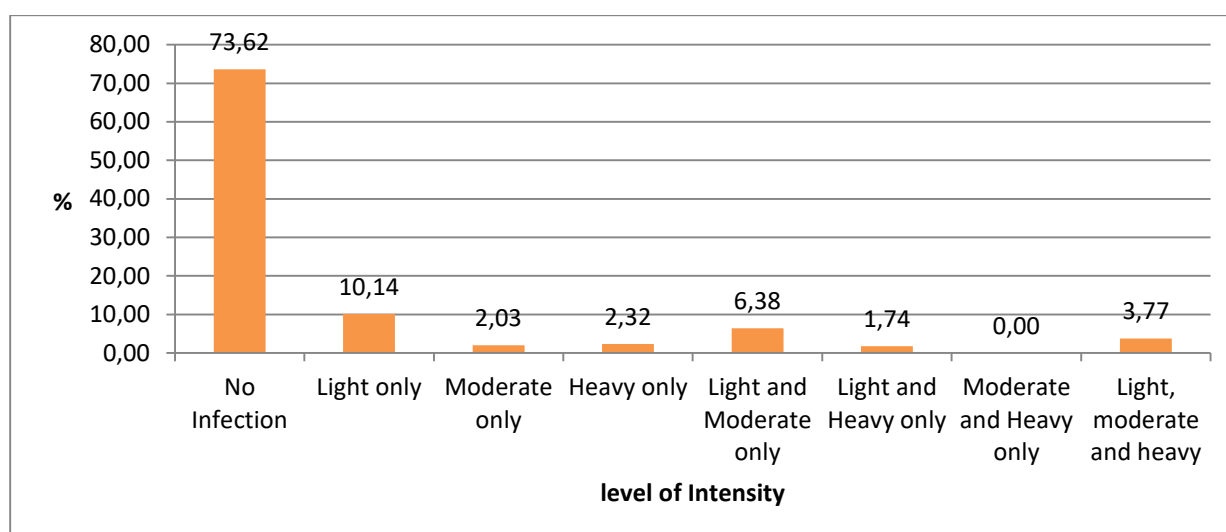
Table 11 : Percentage of children by intensity of infection of *S. mansoni*, according to age and sex

Age and sex	No infection	Light infection	Moderate Infection	Heavy Infection	Total	Number of Children
Age						
10	98.10	1.42	.27	.20	100.00	5567
11	97.65	1.02	.68	.65	100.00	4057
12	97.27	1.17	.59	.97	100.00	4048
13	97.32	.63	1.42	.63	100.00	2588
14	93.01	2.46	2.26	2.27	100.00	1815
Sex						
Male	95.72	1.93	1.28	1.07	100.00	9373
Female	98.76	.58	.27	.40	100.00	8702
Total	97.18	1.28	.80	.74	100.00	18075

4.6.3 Intensity of Infection of *S. mansoni* by schools

Two hundred and fifty four (73.62%) of the surveyed 345 schools have children with no infections, 35 (10.1%) schools have children with only light intensity of infections and 7.69% and 8.79% of the schools have moderate and heavy intensity of infections, respectively [Figure 13]. The remaining schools have children with different intensity of infections; 56(16.23%) of the surveyed schools have at least one child with moderate or heavy intensity of infection and 27 (7.82%) have at least one child with heavy intensity of infections.

Figure 13: Distribution of schools by *S. mansoni* intensity of infection



In the majority of schools the intensity of infection was light. The majority of schools with higher proportion of children heavily infected with *S. mansoni* were located in Zoba Debub. Schools with heavy intensity infections include: Mai Gume Elementary and Junior school (18.26%) followed by Rahwa Junior School (9.97%), Halibo Elementary school (7.93%), Warsay junior school (7.59%), Mendefera junior (6.9%) and Mihiram Geido Elementary school (6.25%). See **Error! Reference source not found.**, **Error! Reference source not found.**, **Error! Reference source not found.** and **Error! Reference source not found.** for the list of schools by intensity of *S. mansoni* infections.

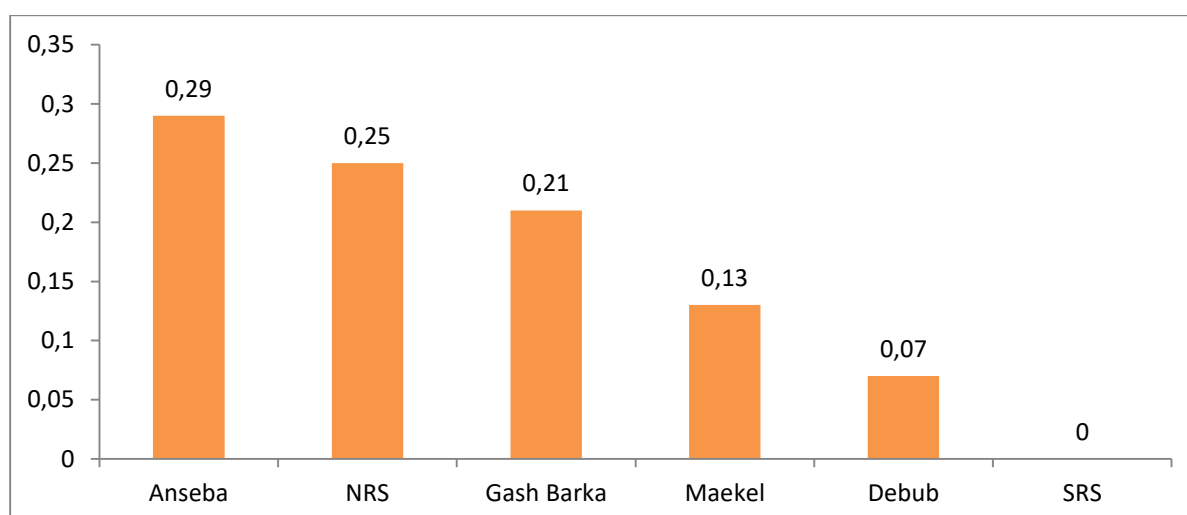
4.7 Intensity of Infection of any STH

4.7.1 Intensity of Infection of Any STH by Zoba and sub-zoba

As indicated above almost all (99.8%) of the surveyed children were free from any STH infections. In all the five zobas where STH was found, no high or moderate intensity of infection was detected. The rate of light intensity infection is as follows: Anseba 0.29%, SKB 0.25%, Gash Barka 0.21% Maekel 0.13% and Debub 0.07% [

Figure 14: Distribution of light Infection from **any STH** in all zobas].

Figure 14: Distribution of light Infection from any STH in all zobas



Out of the 58 sub zobas of the country, 20 sub zobas had light infection of STH. The remaining 38 sub zobas were free of STH infection. The sub zoba with the highest infection is Halhal (1.57%) followed by Aqurdet, Ghindae and Hagaz with percentages of 1.2%, 1% and 0.87% respectively. The remaining six sub zobas, namely Mensura, Logo Anseba, AdiKeih, Gogne, DebubawiMibraaq and Habero rank from fifth to tenth with percentages ranging from 0.66% to 0.44%.

4.7.2 Intensity of Infection of Any STH by age and sex

Disaggregation of STH infection by age shows that light infections from any STH occurred among students aged 14 years(0.32%) followed by 13 years of age (0.24%). The lowest infection occurred among students' aged 12 years (0.09%). Comparison of STH light infection by sex showed that males are more prone to the infection than females (0.23% Vs 0.10%)

Table 12: Distribution of light Infection from any STH in all zobas]. Results of the study show that there is no significant difference in intensity of infections from any STH between boys and girls.

Table 12: Distribution of light Infection from any STH in all zobas

Age and sex	No infection from any STH	Light Infection from any STH	Moderate Infection from any STH	Heavy infection from any STH	Total
Age					
10	99.87	0.13	0.00	0.00	5567
11	99.81	0.19	0.00	0.00	4057
12	99.91	0.09	0.00	0.00	4048
13	99.76	0.24	0.00	0.00	2588
14	99.68	0.32	0.00	0.00	1815
Sex					
Male	99.77	0.23	.09	.03	9373
Female	99.9	0.10	.02	.07	8702
Total	99.83	0.17			

4.7.3 Intensity of Infection of Any STH by schools

The survey showed that in 31 out of the 344 surveyed schools there was light STH infection. Table 13 shows that the following five schools had the highest intensity of infections: Abdela Degol (10.03%), Alnejah (9.37%), Gerger (6.73), Erdi (5.26%) and Alnahda (5.12%). See **Error! Reference source not found.** for detailed list of STH intensity of infection.

Table 13: Schools with at least one child having moderate or heavy intensity of infections from any STH

Sub-zoba	School	No infection from any STH	Light Infection from any STH	Moderate Infection from any STH	Heavy infection from any STH	Number of Students
Kerkebet	Hamush Duba Elementary	91.71	0	0	8.29	58
Kerkebet	Aykarie Elementary	94.48	3.79	1.73	0	53
Kerkebet	Amalayet Elementary&Junior	79.67	3.39	10.17	6.78	29
Adequala	Rahwa Junior	95.33	2.33	0	2.33	51
Dbarwa	Debarwa Elementary	88.19	9.7	2.11	0	50
Dbarwa	Tala Elementary	92	6.06	1.94	0	50
Imnihaili	Egri Mekel Elementary	93.79	4	2.21	0	50

Mendefera	Fre Kalsi Elementary	92	0	1.71	6.29	50
Mendefera	Ma'ahad Elementary	94.13	1.87	1.87	2.13	50
Berik	Tsaeda Christian Elementary	96.16	1.92	1.92	0	52

4.8 Relationship of infection with selected background characteristics

Chi-square procedure of the SPSS program was used to test the statistical significance of the relationship between infections of SCH and STH with selected background characteristics of the children surveyed. The background characteristics considered were age, sex, and zoba.

4.8.1 Relationship of SCH and any STH infection with age, sex, and zoba

The analysis showed that the relationship between SCH infections and all the background characteristics considered was strongly significant [

Table 14: SCH infection status of children age 10-14, according to selected background characteristics]. Girls, younger children, and those residing in Zoba Debub are more likely to be infected with SCH than their counterparts ($p=0.000<0.001$).

Table 14: SCH infection status of children age 10-14, according to selected background characteristics

Background Characteristic	Negative	Positive	Number of Students	Association measure	
				χ^2	
				P-value	Sig.
Sex					
Male	0.96	0.04	9373	152.096	0.000***
Female	0.99	0.01	8702		
Age					
10	0.98	0.02	5729	141.03	0.000***
11	0.98	0.02	4127		
12	0.97	0.03	3886		
13	0.97	0.03	2442		
14	0.93	0.07	1890		
Zoba					
Anseba	0.988	0.012	2120	834.248	0.000***
Debub	0.913	0.087	4835		
Debubawi Keih Bahri	100.000	0.000	297		
Gash-Barka	0.996	0.004	5810		
Maekel	0.993	0.007	3180		
NRS	0.988	0.012	1833		

*** Significant at 0.001 level of significant

The likelihood of infections from any STH does not vary by sex of children [Table 15] even though the difference was statistically significant ($P=0.033<0.05$). Similarly, there is no statistically significant variation in the likelihood of infection from any STH by age of the children ($P=0.274>0.05$) and zoba ($P=7.544>0.05$) where they reside.

Table 15: Any STH infection status of children age 10-14, according to selected background characteristics

Background Characteristic	Negative	Positive	Number of Students	Association measure	
				χ^2	
				P-value	Sig.
Sex					
Male	0.998	0.002	9373	4.543	0.033*
Female	0.999	0.001	8702		
Age					
10	0.999	0.001	5728	5.137	0.274
11	0.998	0.002	4127		
12	0.999	0.001	3887		
13	0.998	0.002	2443		
14	0.997	0.003	1890		
Zoba					
Anseba	0.997	0.003	2120	7.54	0.183
Debub	0.999	0.001	4835		
Debubawi Keih Bahri	100.0	0.0	297		
Gash-Barka	0.998	0.002	5810		
Maekel	0.999	0.001	3180		
NRS	0.997	0.003	1834		

** Significant at 0.01 level of significant

4.9 Determinants of Infections of SCH and STH

The earlier bivariate analysis showed that there are differentials between infection from SCH and any STH and selected background characteristics of children (age, sex, and zoba). There is, however, a need to appraise the effect of a single factor when other variables are controlled. Therefore, when evaluating the effects of any factor on intensity of infections, a multivariate analysis is necessary to control for the effects of others. To this end, logistic regression analysis was carried out to quantify the net effects of age, sex, and zoba on the likelihood of infection from SCH and any STH; which will be the dependent variables. In order to use logistic regression model, the dependent variables were transformed (recoded) to dichotomous variables to fit the model, as the logistic regression is used only for the variables that have dichotomous nature.

The output of the regression model included level of significance, coefficients, odds ratio and probabilities of infections from the parasites. The interpretation of the results was based on the references categories. The reference categories were selected on the basis that they have the least likelihood of infections from the parasites.

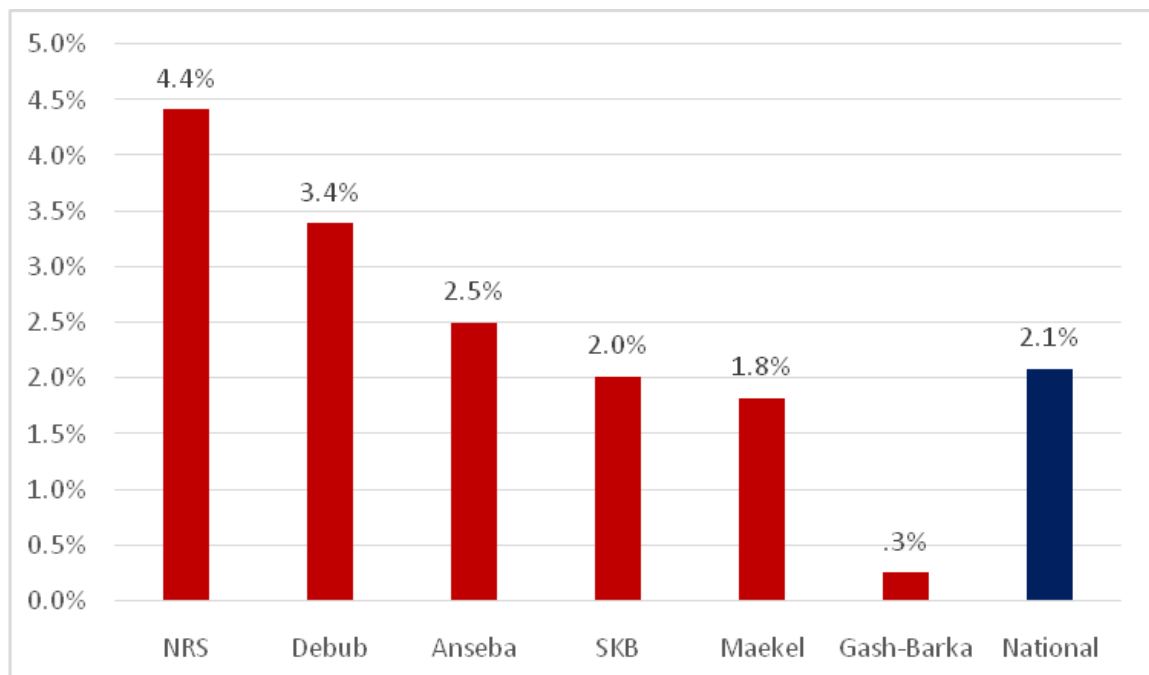
Prevalence & Intensity of Infection of *H. nana*

Although the main objective of mapping survey was to identify and determine the prevalence of *S. mansoni* and STH (*A. lumbricoides*, *T. trichiura* and hookworm), other parasites found during the survey were also documented, tabulated and analysed. One of the parasites that were found commonly in all the six zobas of the country was *H. nana*.

4.10.1 Prevalence of *H.nana* by Zoba & Subzoba

The study showed that *H. nana* prevalence in Eritrea is 2.1%. The highest prevalence of *H.nana* was found in SKB with 4.4% followed by Debub, Anseba and DKB with prevalence of 3.4%, 2.5% and 2.0% respectively [Figure 15].

Figure 15: Prevalence of *H.nana* by Zoba



Out of the 58 subzobas surveyed *H.nana* was found in 47 of them. The highest prevalence of *H.nana* was found in Mendefera sub zoba (11.63%) followed by Kerkebet, Foro and Gelalo (9.60%, 8.73% and 8.24%), respectively.

Table 16: Prevalence of H.nana by Sub Zoba& Zoba

Zoba/Subzoba		Prevalence	Number of Students
Anseba			
Sub-zoba	Hagaz	0.00	279
	Adi-Tekelezan	1.39	283
	Asmat	0.00	280
	Elaberd	0.00	239
	Geleb	0.00	285
	Habero	4.58	263
	Halhal	.49	279
	Hamelmallo	1.69	275
	Keren	4.69	281
	Kerkebet	9.60	196
	Selea	6.98	199
	Total	2.51	2859
Debab			
Sub-zoba	Adiquala	1.40	251
	Adikeih	4.06	483
	Areza	.66	501
	Dbarwa	2.34	454
	Dekemhare	3.13	480
	Imnihaili	3.07	352
	Maiaini	1.98	260

	Maimine	.40	352
	Mendefera	11.63	402
	Segeniti	2.51	197
	Senafe	6.80	403
	Tsorona	2.99	370
	Total	3.40	4505
DKB			
Sub-zoba	Areata	0.00	188
	Assab	3.18	262
	Debub denkalya	1.60	238
	Maakel denkel	2.02	254
	Total	2.18	942
Gash-Barka			
Sub-zoba	Aquordet	.31	491
	Barentu	.31	540
	Dighe	1.90	254
	Forto	1.23	218
	Gogne	0.00	421
	Goluj	.08	279
	Haykota	0.00	210
	Lelay Gash	0.00	265
	Logo-Anseba	.20	448
	Mensura	0.00	384
	Mogolo	0.00	255
	Molqui	0.00	335

	Shambuko	.54	523
	Tessenei	.92	555
	Total	.26	5178
Maekel			
Sub-zoba	Berik	3.42	255
	Debubawi Mbrak	1.64	275
	Debubawi-me'rab	2.87	260
	Gaa-Nefhi	1.11	253
	Semenawi-me'rab	2.14	226
	Semenawi-mibrak	1.20	251
	Serejeka	1.90	273
	Total	1.81	1793
SKB			
Sub-zoba	Adobha	2.31	104
	Afabet	3.05	260
	Foro	8.73	250
	Gel'alo	8.24	211
	Ghindae	2.66	507
	Karura	4.48	281
	Massawa	4.91	450
	Nakfa	.66	277
	Sheib	6.20	324
	Dahlak	3.07	134
	Total	4.43	2798

4.10.2 Prevalence of *H.nana* by Schools

The highest prevalence of *H.nana* was found in Senafe Elementary school (24.31%), followed by Fithi Junior school in Mendefera sub zoba, Amalayt elementary school in Kerkebet s/zoba and Irafale elementay and junior school in Foro sub zoba (22%,21.21% and 18.01%), respectively. The prevalence in the rest of the schools ranged from 0.00-13.82

Trachoma

Two national surveys on Trachoma were conducted, in 2005 and 2012 to determine the prevalence of trachoma in 3 separate Zobas. The cross sectional survey was conducted in May 2005, in Gash-Barka, Debub and Northern Red Sea Zones, in children 1 - 9 years of age and adults above 15 years of age. Trachoma in children was more prevalent in Debub followed by Northern Red Sea (SKB) and was least prevalent in Gash Barka. Prevalence of TF in children 1 – 9 years was 14.9% in Debub. In SKB it was 5.5% and Gash Barka it was 2.4%. Prevalence of TT was higher in older age groups and in persons with no schooling. The highest prevalence in the country is in Mai mine sub-zoba in Debub with over 69% prevalence of TF in children 1–9 years of age. Other sub-zobas in Debub with high prevalence include Adi Quala with 26.4%. Areza, Dubarwa, Emni Hayli, Senafe and Mendefera have prevalence between 10 and 20%.

In Northern Red Sea, Nakfa has prevalence of 11.1%, while Afabet, Ghindae, Massawa and Shieba have more than 5% but less than 10%. In Gash Barka, only Barentu and Shambuqa have more than 5% but less than 10%.

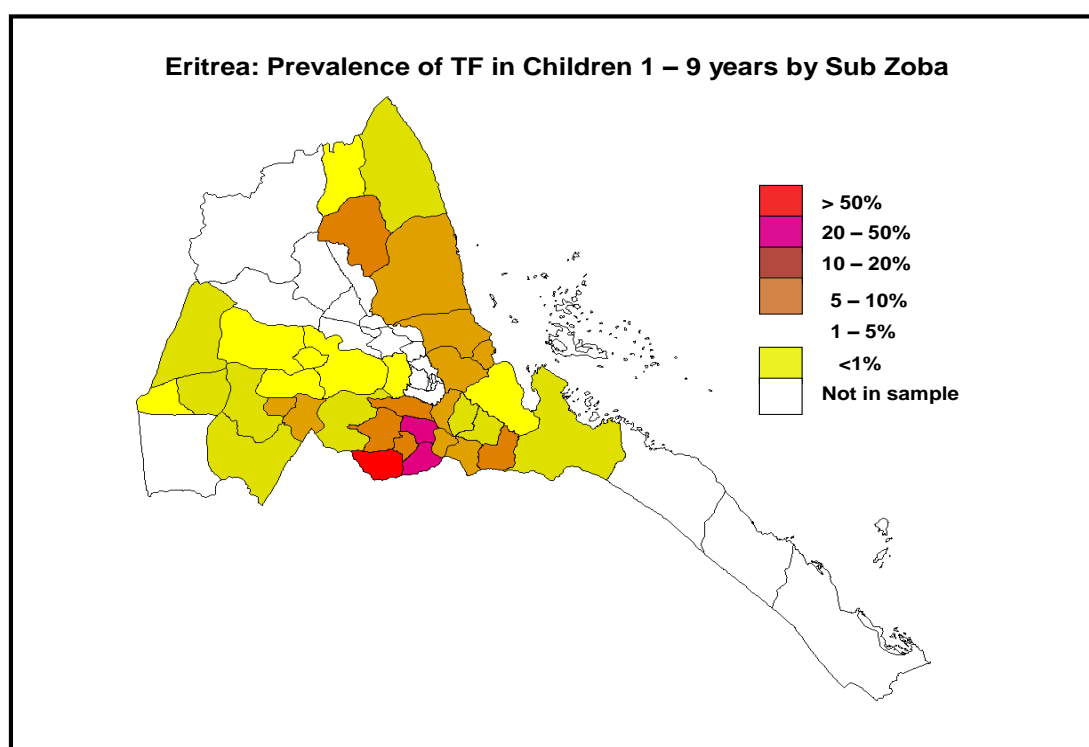
All Sub-zobas with high prevalence of TF in children also have high prevalence of TT in adults except Massawa, Mendefera and Nakfa. In addition, some sub-Zobas with relatively lower prevalence of TF in Children have higher prevalence of TT in adults. These include Logo Anseba, Molqui and Omhajer in Gash Barka, Dige-Adobha in SKB and Adi Keyh in Debub. Implementation of MDAs for 8 sub-zobas found to be endemic for Trachoma was started in 2011.

Table 2c: Trachoma distribution in the country

Province or region	Sub zoba or community*	Prevalence (number and rate)	Study method	Year of survey
Anseba	Hagaz	8.5	ITI guidelines	2014
	Adi-Tekelezan	9.8	ITI guidelines	2014
	Asmat			
	Elaberd	9.8	ITI guidelines	2014
	Geleb	9.8	ITI guidelines	2014
	Habero	9.8	ITI guidelines	
	Halhal	8.5	ITI guidelines	2014
	Hamelmalo	8.5	ITI guidelines	2014
	Keren	8.5	ITI guidelines	2014
	Kerkebet			
	Selea			
Debub	Adequala	26.4	ITI guidelines	2006
	Adikeih	1.8	ITI guidelines	2006

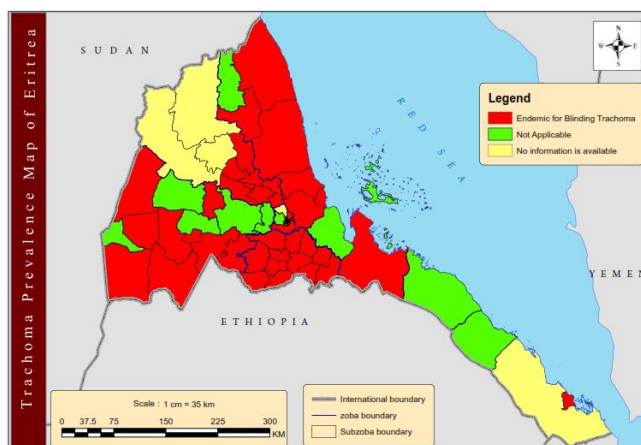
	Areza	10.7	ITI guidelines	2006
	Dbarwa	16.7	ITI guidelines	2006
	Dekemhare	6.6	ITI guidelines	2006
	Imnihaili	16.7	ITI guidelines	2006
	Maiaiini	8.6	ITI guidelines	2006
	Maimine	69	ITI guidelines	2006
	Mendefera	20.5	ITI guidelines	2006
	Segeniti	3.3	ITI guidelines	2006
	Senafe	15.6	ITI guidelines	2006
	Tsorona	6.8	ITI guidelines	2006
DKB	Areta	0	Rapid assessment	2012
	Makelay Keyih Bahri	0	Rapid assessment	2012
	Debub Denkalia			
	Asseb	2.8	Rapid assessment	2012
Gash Barka	Agurdet	0.9	ITI guidelines	2006
	Barentu	7.5	ITI guidelines	2006
	Dighe	0	ITI guidelines	2006
	Forto	3.5	ITI guidelines	2006
	Gogne	1.9	ITI guidelines	2006
	Haycota	1.7	ITI guidelines	2006
	Logo Anseba	0	ITI guidelines	2006
	Mensura	0	ITI guidelines	2006
	Mogolo	0	ITI guidelines	2006
	Gulug	1	ITI guidelines	2006
	Shambuko	6.8	ITI guidelines	2006
	Mulki	4.7	ITI guidelines	2006
	Teseney	0	ITI guidelines	2006
	Laalay Gash	4.3	ITI guidelines	2006
Maakel				
	Berik	0	Rapid assessment	2012
	Debubawi Mbrak	0	Rapid assessment	2012
	Debubawi-me'rab	10	Rapid assessment	2012
	Gaa-Nefhi	5.8	Rapid assessment	2012
	Semenawi-me'rab	0	Rapid assessment	2012
	Semenawi-mibrak	7.7	Rapid assessment	2012
	Serejeka			
SKB	Ghelealo	1.4	ITI guidelines	2006
	Foro	0	ITI guidelines	2006
	Dahlak	0	ITI guidelines	2006
	Massawa	5.6	ITI guidelines	2006
	Ghindae	5.8	ITI guidelines	2006
	Shieb	5.5	ITI guidelines	2006
	Afabet	7.9	ITI guidelines	2006
	Nakfa	11.7	ITI guidelines	2006
	Adobha	0	ITI guidelines	2006
	Karora	1.4	ITI guidelines	2006

Figure 10: Prevalence of TF in Children 1-9 years by sub-Zoba (SKB, Debub and Gash Barka)



The 2012 study was a Trachoma Rapid Assessment in Zoba Anseba, Maakel, and DKB and the results are shown in figure 10.

Figure 11: Trachoma endemicity map



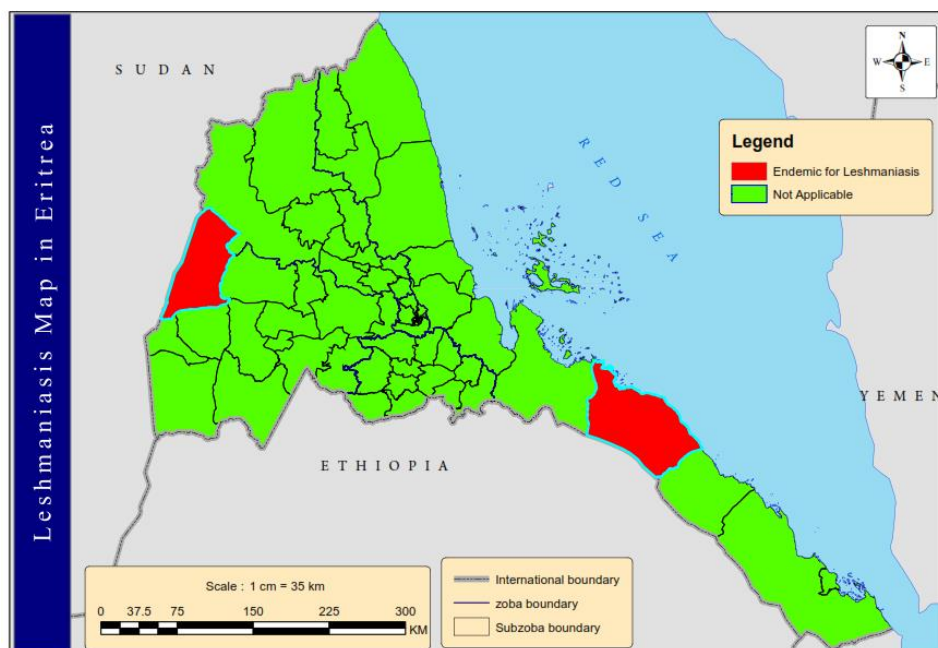
Lymphatic filariasis

Lymphatic filariasis is caused by *Wuchereria bancrofti*. There are 142 Filariasis cases reported between 1998 -2011 from different health facilities in all the zones of the country (Source, HMIS). LF transmission is optimum in high humidity areas transmitted by mosquito of both *Anopheles* and *Culex* spp. In 2014, 57 villages were mapped for LF using ICT cards. Out of these villages , 7 individuals tested positive by ICT card. The positive results were found in two villages, Adibara (Gash Barka) and Tio (DKB). Adibara borders Sudan while Tio is located in the coastal area.

Table 2d: LF distribution in the country

	Zoba	Location /site	Prevalence (%)	Method used	Year documented (Source)
	National NTD Mapping - 2014				
	Gash-Barka	Forto	<1% (6/22)	ICT Cards	2014; National NTD Mapping
	DKB	Arata (Tio)	<1 (1/100)	ICT Cards	2014; National NTD Mapping

Figure 11: LF endemicity map



Leprosy

Leprosy control program is one of the oldest program in the country. Leprosy is prevalent all over the country. Cases are treated currently at central level in the Leprosy Hospital in Asmara. In recent times cases are coming mostly from Debub and Southern Red Sea Zoba. In 2012, seven cases were reported by the National Leprosy Hospital.

Dengue fever

Dengue fever is one of the epidemic prone diseases that is rapidly expanding in many parts of the world. Dengue haemorrhagic fever has been common in the West African countries. In recent years, outbreaks of dengue fever have occurred in the east coast of Africa expanding from Ethiopia to Mozambique as well as in the shores of the small islands of Comoros and Seychelles. Similar cases of dengue haemorrhagic fever like illnesses have also been reported in Saudi Arabia. There are four sero-types of the virus and each one can manifest itself in one of the three forms: as Dengue Fever (DF), Dengue Haemorrhagic Fever (DHF) or Dengue Shock Syndrome (DSS).

There were reports of DF like outbreaks in the Western part of Eritrea, in the Gash-Barka region, in 2005 - 2008 (MOH Reports). In the recent past years, there were continuous incidences of increased dengue like febrile illnesses in the Northern Red Sea, Southern Red Sea and Gash-Barka Zones of the country that was locally nick named as “Welcome” disease. In the years 2006 – 2008, although the trend was low, there was almost a continuous transmission throughout the year. One expects an increase in the incidence of the DF outbreak following the rainy season which is usually between the period November – January, however, the incidence of the suspected DF cases did not look to limit within this period of time alone. This was mainly because of the presence of various water bodies such as open public pipe water that continually leak into their surroundings, open tankers, swamps, disposed tires, open water barrels at homes that served for the free reproduction of the mosquitoes, *Aedes aegypti*.

The attack rates of dengue fever in the three Zones during the period 2010 – 2012 are presented below. This data includes only those cases seen at the health centers and hospitals

but not those seen at the health stations, where majority patients are seen. Suspected dengue fever cases seen at health stations are excluded because of possible over diagnosis due to overlap with malaria cases and lack of confirmatory diagnostic tests at this level of health facility. There were no cases of mortality reported in any of the Zones.

Table 2e: Dengue Fever Incidence by Year and Zones in Eritrea

	2010	Population	Attack Rate (per 100,000)	2011	Population	Attack Rate (per 100,000)	2012 (10 months)	Population	Attack Rate (per 100,000)
SKB	6,664	607,414	1,097	6,879	624,422	1,102	4,776	641,906	744
DKB	366	61,103	599	1726	62,993	2,740	845	64,941	1,301
Gash-Barka	3,414	705,675	484	5405	727,500	743	3667	750,000	489

(Source: MOH)

To further verify and document the presence of DF in the region, WHO and the MOH conducted a cross sectional study in Massawa and its surroundings in March 2010. A total of twenty six blood samples were collected and sent to KEMRI, Nairobi, for analysis and serotyping. The result showed that 23/26 (88%) were positive for Dengue Fever virus sub-type 1. Out of the 26 patients seen only 5 (19%) were Females while the rest (81%) were Males. The age group of the patients ranged from 9 up to 58 years and the majority were above the age 15 years.

DF virus serotypes can manifest in any one of the clinical manifestations. The signs and symptoms that were seen in Eritrea were typical of DF and in most, blood film for malaria was negative. The main clinical manifestations included an acute fever plus: headache, severe muscle pain, arthralgia (back pain), anorexia and fatigue.

The illness affected all sex and age groups though pronounced among the age group 5 years and above. Except for a few health facilities, all health facilities in the region reported DF like illness outbreak.

Overall the trend and severity of the disease has been increasing with time and recently, there were reports of suspected Dengue Haemorrhagic Fever among Chinese working in the Cement Factory in the Northern Red Sea Region of the country. In addition, Dengue fever is reported to be expanding to the other hitherto unaffected villages and towns in the coastal region.

Leishmaniasis

Leishmaniasis is reported from health facilities in different corners of the country but mainly from Gash Barka Northern Red Sea , Debub , Anseba and Maekel. The distribution by age is 5% of the cases "LessThanFive" and 95% "FiveAndAbove". The reported data is aggregated from all Leishmaniasis cases (mucocutaneous, cutaneous and visceral leishmaniasis). The usual pattern in Horn of Africa for visceral leishmaniasis is the lowlands (Western and South) and for cutaneous leishmaniasis the highlands (Central and Northern), although population movements should be considered and taken into account for the planification

Co-endemicity of NTD's

Data on the co-endemicity of NTD's in Eritrea is scanty. Table 3 shows sub-Zobas where co-endemicity has been confirmed.

Table 3: NTD co-endemicity

Zoba	Sub Zoba	Diseases						
		Preventive Chemotherapy Diseases				Case management Diseases		
		LF	Schisto	STH	Trachoma	Dengue fever	Leishmaniasis	Leprosy
Anseba	Elabered	-	-	+	+	+	+	
	Geleb	-			+			
	Keren	-	-	+	+	+	+	+
	Hagaz	-	-	+	+	+		
	Halhal	-	+	+	+		+	
	Habero	-	-	+	+	+		
	Asmat	-	-					
	Kerkebet	-	-			+		
	Sela	-	-					
	AdiTekelezan	-	+	+	+			
	Hamelmallo	-	-	+	+	+		
Debub	Debarwa	-	+	+	+			+
	Areza	-	+		+			+
	Mendefera	-	+	+	+		+	+
	Dekemhare	-	+	+	+	+	+	+
	Segeneiti	-	+	+	+		+	+
	AdiKeyih	-	+	+	+	+	+	+
	Senafe	-	+	+	+	+	+	+
	Tsorona	-	-	+	+			+
	Adiquala	-	+	+	+	+	+	+
	Emni-Haili	-	+		+			+
	May- aynee	-	+	+	+			+
	Mai-Mine	-	+		+	+		+
DKB	Areta	-	-	+	+	+		
	MakelayKeihbahri	-	-		+	+		+
	DebubDenkalia	-	-		+			+
	Asseb	-	-	+	+	+	+	+
Gash-Barka	Akordat	-	-	+	+	+	+	+
	Barentu	-	-	+	+	+	+	
	Dighe	-	-	+	+	+		

	Forto	-	-	+	+	+		
	Gogne	-	-	+	+			
	Haycota	-	+	+	+			
	LogoAnsseba		+	+	-	+		
	Tesseney		-		-			
	Mensura		-	+	-		+	
	Mogolo		-	+	-	+		
	Guluj		+	+	+		+	+
	Shambuko		-		+		+	
	Mulki		+	+	+		+	
	La'elay Gash				+			
	Omhajor				+			
SKB	Ghelealo				+			
	Foro				+			
	Dahlak				-			
	Massawa				+			
	Ghindae				+			
	Shieb				+			
	Afabet				-			
	Nakfa				+			
	Adobha				-			
	Karora				+			
Maakel	Serejeka				-			
	Berikh				-			
	Ghalaneffi				+			
	North east Asmara				-			
	North west Asmara				+			
	South west Asmara				-			
	South East Asmara				+			

Figure 16: Co-endemicity map for Neglected Tropical Diseases in Eritrea

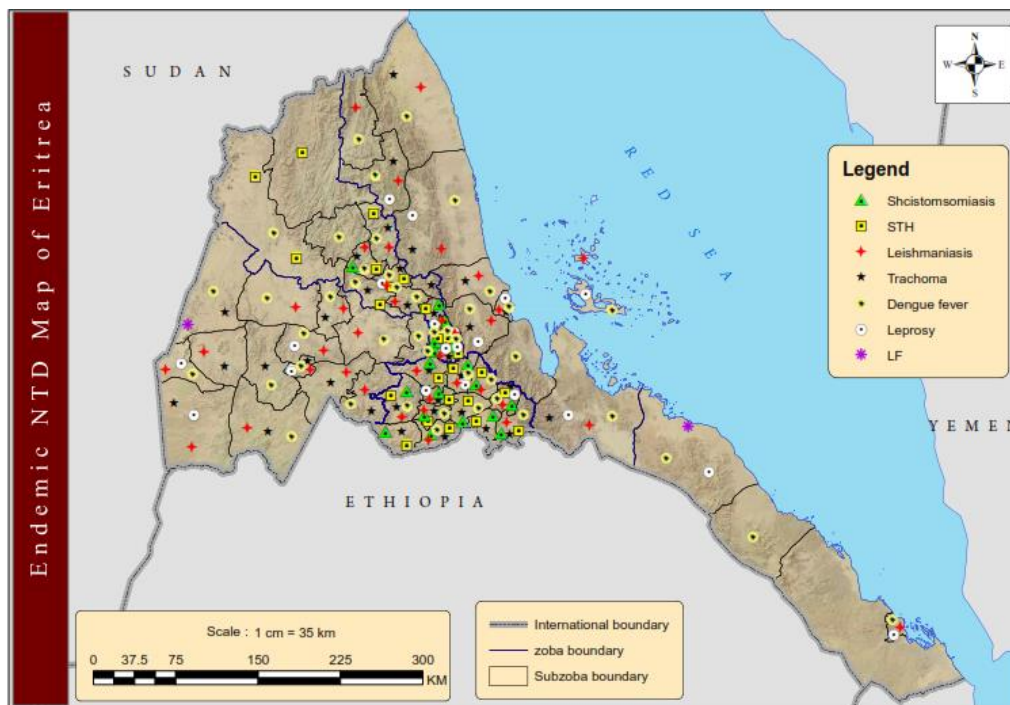


Table 4: NTD mapping status

Endemic	Total number of Sub-zones	Number of Sub zones suspected to be endemic	Number of sub zones mapped or known endemicity status	Number of Sub zones to be mapped
Schistosomiasis	58	31	28	0
STH	58	58	21	0
Leishmaniasis	58	58	0	0
Lymphatic Filariasis	58	24	0	0
Trachoma	58	58	55	0
Dengue fever	58	58	0	58
Leprosy	58	58	0	58
Brucellosis	58	58	0	58
Anthrax	58	58	0	58
Rabies	58	58	0	58

**Trachoma partially mapped used Trachoma Rapid assessment in 2012*

1.3.2 NTD programme implementation

This section lists the past and on-going NTD control programmes for the PCT and CM-NTDs. These interventions are also summarized for PCT and CM-NTDs in tables 5.1 and 5.2 and annexes 1.6 and 1.7 respectively.

Past and current NTDs intervention for PCT NTDs.

SCH

Past and current interventions: Mass drug administration and associated interventions were done in some places of Zoba Anseba (Adi tekelezan sub-zone in 2011 and 2012)

and Zoba Debub (Adi-Qualla Sub-zone in 2010 and 2012. Mapping has recently been concluded.

After Mapping 2014 and 2015 in two subzones of zoba Debub (Mai Aini and Dekemhare sub zones MDA for SCH and STH is conducted ,as the same time for all students found positive for STH and SCH given praziquantil and albendazole.

STH

No MDA intervention was implementend. But with this new strategy and having completed the mapping in all Zobas, MDA will not commence because the prevalence is below tresh hold .

LF

There has been no on-going intervention, however having completed the mapping for this disease, appropriate interventions will follow as reflected in the 2015 annual work plan.

Trachoma

Trachoma mapping has been completed in 4 Zobas and intervention is on-going in 8 sub-Zobas. Impact assessment was conducted in 2014 in 7 of the 8 sub-Zobas and 6 were declared free of infection.

Leprosy

The Leprosy control program is joined with the National TB control program and hence most activities are jointly performed. The Hansonian Hospital in the central zone is the only hospital that is designated to initiate treatments and follow some of them. All suspected cases from the sub zones are referred to the central level for confirmation and treatment of the cases. The hospital provides treatment and adjuvant treatment for co-existing conditions. Currently the case finding management has been confined to passive one where patients seek medical attention.

The capacity building particularly in case management of leprosy has been sub-optimal. However packages of trainings have been given together with TB. The program collects data on case notification and treatment outcome every quarter.

The program has also managed to come up with revised guidelines for leprosy in August 2013.

Dengue Fever & Leishmaniasis

Other CM-NTDs- Lymphatic filariasis, Leishmaniasis, Degue Fever there are no on-going national programmes. They are managed at health facilities whenever patients appear in the facilities. These diseases will be addressed as reflected in this document.

Table 5.1: Summary of intervention information on existing PCT programmes

NTD	Date Program started	Total sub zones targeted	No. Of Sub zones covered (geographical coverage)	Total population in target Sub zone	No. (%) covered	Key Strategies used	Key Partners
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Trachoma	2011	8	8	1364830		SAFE,MDA	Fred Hollows, MOH ITI,UNICEF,CBM,W ASH
SCH	2010	3	3	3246	3002(92 %)	MDA	WHO,MOH
STH*							
LF*							

*: Not yet

Table 5.2: Summary of intervention information on existing CMDs

NTD	Date Program started	Total sub zones targeted	No. Of Sub zones covered (geographical coverage)	Total population in target Sub zone	No. (%) covered	Key Strategies used	Key Partners
Leprosy	1970	6	57	-	-	Active/Passive case finding	WHO
Leishmaniasis	Not yet						
Dengue Fever	Not yet					Active/Passive case finding	WHO
LF	Not yet	2					
TT	2011	8	5	422,660	62%	Active/Passive case finding	ITI

1.3.3 Gaps and Priorities

The gaps and priorities for the NTD programme in Eritrea as listed below have been used to develop the SWOT analysis and the SWOT counteracting table.

The SWOT analysis table 6.1 implementation of the NTD programme in Eritrea. A further analysis of the SWOT on table 6.2 matches the strengths and opportunities which can be used to counter the identified weaknesses and threats to the programme.

Table 6.1: SWOT Analysis

Strengths	Weaknesses	Opportunities	Threats
Country profile			
Well organized administrative structure		Growing international interest on NTDs More resource available on NTDs More local partners	SAFE activities ongoing in the Ministry of health
Good health system indicators	Weak Intra and inter sectoral collaboration		
Existence of community health agent	Weak IDM programmes		Malaria and TB in the same division as NTD
Functional health delivery system	Poor electricity supply		

Very good road network			
New staff posted to the NTD programme	Low mobile telephone penetration network	More local partners for NTDs	Expensive fuel and higher car rental rate
Successful experience including Guinea worm eradication and certification in 2011	Weak experiences in majority of the NTDs; Inadequate experienced human workforce	Growing international interest on NTDs	Inadequate funding of NTDs
Good intersectoral participation in reviewing of master plan.	Poor advocacy and resource mobilization for NTDs	More resource available on NTDs	Inadequate safe water supply and latrines
Good performance of Trachoma and leprosy	Lack of health policy and guideline on NTDs	Increasing political commitment	Poor Cross border collaboration
The WHO recommended health worker/population ratio		More partners for NTDs	Presence of high priority diseases overshadowing NTDs
Inadequate national funding			
Mapping completed for PCT NTDS, however Maakel and DKB were done by rapid assessment method in a non-representative sample for Trachoma			

Table 6.2: SWOT counteracting table

Weaknesses	Strengths counteracting weaknesses	Opportunities counteracting weaknesses
Weak intra and inter sectoral collaboration	Good intersectoral participation in reviewing of master plan.	Malaria in the same division with NTD.
Weak IDM programmes	Good performance of Trachoma and leprosy	
Poor electricity supply	Costed master plan	
Low mobile telephone penetration network		
Inadequate experienced NTD workforce	The WHO recommended health worker/population ratio New staff posted to the NTD programme	
Poor advocacy and resource mobilization for NTDs		Growing international interest on NTDs More resource available on NTDs

		More local partners
Lack of health policy and guideline on NTDs		
Inadequate national funding	Costed master plan	
Treads		
Expensive fuel and higher car rental rate	Good road network	
Inadequate funding of NTDs		Global availability
Inadequate safe water supply and latrines	SAFE activities ongoing in the Ministry of health	
Poor Cross border collaboration		Collaboration between Eritrea and neighboring countries.
Presence of high priority diseases overshadowing NTDs		Malaria and TB in the same division

- a) Assessment of trachoma in two Zobas (Maakel and DKB) was done in 2012 using a rapid assessment method with a sample size that was not representative. Thus, detailed mapping based on WHO guidelines is needed in these Zobas.
- b) Poor advocacy and resource mobilization for NTDs
- c) Insufficient national funding of NTDs
- d) Inadequate experienced human workforce;
- e) Lack of NTD policy and guideline; NTD training manual.
- f) Weak inter-sectoral collaboration and poor joint planning;
- g) Low mobile telephone penetration network
- h) Transportation challenges

Following the above gaps, the main priorities of NTDs in Eritrea are as follows.

Planning: An NTD policy will be developed as well the relevant NTD guidelines. Annual work plans will be drawn from these devised work plans.

Coordination and Management: A leadership and management trainings will be organized at national and zonal levels. Collaboration between the MoH and other ministries such as Education, water and environment will be intensified. Moreover the engagement of partners and will be an inclusive and participatory approach.

Partnerships: A network of partners interested in some particular NTDs such as Trachoma exists within the country. Opportunities are there to bring other partners on board to support other NTDs.

Implementation of Interventions: There are ongoing NTD interventions strengthen further by the development of master plan. Activities that will be given priority will

include development of policies and guidelines, national training curriculum and tools, IEC materials and advocacy at all levels. PHASE approach will be prioritized and access to intervention scaled up across all endemic sub-Zobas. The health system administrative structure and the community structure will collaborate to insure successful implementation of interventions. Opportunities of NTD drug donations will greatly reduce the cost of implementation of interventions.

Surveillance, Monitoring and Evaluation: NTDs will be incorporated and monitored alongside other conditions through the existing HMIS system in the MoH and monitored alongside other health interventions. The NTD programme will also supervise closely all intervention as the country moves from control to elimination of most NTDs. monitor progress of implementation. M&E tools will therefore be developed and annual reviews of programmes conducted based on the results to track progress.

PART 2: NTD STRATEGIC AGENDA

This part of the Master Plan articulates the strategic agenda, comprising the overall programme Mission, Vision, Strategic Goal, Programme focus, milestones, strategic priorities and the objectives for each NTD.

2.1. Overall NTD Programme Vision, Mission and Goals

Vision

- Eritrea free of neglected tropical diseases and related morbidity and disabilities

Mission

- To provide cost-effective, sustainable, equitable, and community-owned interventions for the prevention, control and elimination and/or eradication of targeted NTDs through a coordinated, and where possible, integrated NTD control programme.

2.2. Guiding principles and strategic priorities

In developing this revised NTD master plan, the following guiding principles were observed.

Implementation of the programme will be guided by the following principles:

- **Inclusiveness:** Consultative process of the NTD programme unit with others relevant units, sectors and partners in agreeing on the need and the modalities for the review.
- **Transparency:** The entire process was transparent and open and everybody view was taken into consideration.
- **Community engagement.** This occurred in the field during the recent NTD mapping.
- **National ownership:** The ministry of health was on the driving and provided some logistic support for the exercise.

The focus of the National Master Plan for Neglected Tropical Diseases in Eritrea is directly informed by the situation analysis presented in Part 1. It is designed to elaborate the approach the programme will take to achieve its stipulated priorities in the next six years (2015-2020), namely:

1. Strengthening government ownership, advocacy, coordination and partnership
2. Improving planning for results, resource mobilization and financial sustainability of National NTD programmes
3. Scaling up access to effective NTD programme interventions and service delivery capacities
4. Strengthening NTD monitoring, evaluation, surveillance and operational research

Table7: Strategic framework summary

STRATEGIC PRIORITIES	STRATEGIC OBJECTIVES
Strengthen government ownership, advocacy, coordination and partnership	Undertake and enhance high level reviews of NTD program performance and the use of lessons learnt to foster government ownership and strengthening of advocacy, awareness and effective implementation of targeted interventions.
	Strengthen advocacy, visibility and profile of NTD prevention, control, elimination and eradication interventions at all levels in Eritrea.
	Strengthen management and coordination mechanisms for the NTD control programme at, national, Zoba, Sub-Zoba and Kebabilevels in Eritrea
	Strengthen and foster partnerships for the prevention, control, elimination and eradication of targeted NTD at national, Zoba, Sub-Zoba and health station levels in Eritrea.
Enhance planning for results, resource mobilisation and financial sustainability of National NTD programmes	Develop integrated gender-sensitive multi-year strategic plan and annual operational plans for the prevention, control, elimination and eradication of targeted NTDs.
	Enhance resource mobilization approaches and strategies at international, national and sub-national levels for NTD interventions.
	Strengthen the integration/linkages of NTD programme and financial plans into sector-wide budget and financial mechanisms.
	Develop and update national NTD policies, guidelines and tools to support active policy and programme implementation.
Scale up access to interventions, treatment and system capacity(service delivery) building	Scale up an integrated preventive chemotherapy, including access to Schistosomiasis, STH, Lymphatic Filariasis, Leishmaniasis and trachoma interventions
	Strengthen case-management-based NTD interventions including integrated packages, for LF, Leprosy and Dengue fever
	Strengthen integrated vector management for targeted NTDs
	Strengthen capacity at national level for NTD programme management and implementation and accelerate implementation of disease burden assessment and integrated mapping of NTDs
Enhance NTD monitoring, evaluation, surveillance and operations research	Strengthen monitoring of national NTD programme performance and outcome including monitoring of adverse drug reaction to NTD medicines and insecticides (Pharmacovigilance)
	Establish integrated data management systems and support impact analysis for NTDs in Eritrea.
	Strengthen the surveillance of NTDs within PHC for Guinea worm, and re-enforce the response to epidemic-prone NTDs in particular Dengue Fever.

	Support operational research and documentation of evidence to guide innovative approaches to NTD program interventions
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2.3 NATIONAL NTD PROGRAMME GOALS, OBJECTIVES, STRATEGIES AND TARGETS

Goal of NTD control

The goal of the NTDP is “to improve the health and socio-economic status of Eritreans by reducing significantly the morbidity, mortality and disability caused by the Neglected Tropical Diseases through cost-effective and integrated interventions to control and eliminate all targeted NTDs”.

General Objective

To significantly reduce the burden and subsequently eliminate the major NTDs (Schistosomiasis, Soil Transmitted Helminths, Lymphatic filariasis, Trachoma, Leprosy, Leshmaniasis, Dengue Fever Anthrax Brucellosis Rabies) in all affected sub –Zobas in Eritrea by 2020.

Table 8 provides a summary of the global and national disease-specific goals, objectives, strategies, national targets, indicators for the targeted NTDs and delivery channels.

Table 8: Summary of NTD disease specific goals and objectives

NTD PROGRAMME AND GLOBAL GOAL	NATIONAL TARGET	OBJECTIVES	TARGETS	STRATEGIES	DELIVERY CHANNELS	KEY PERFORMANCE INDICATORS
Lymphatic Filariasis Elimination Goal: Elimination as a board public health problem by 2020.	To eliminate LF as a public health problem by 2020.	1. To implement MDA in 100% of endemic sub zones by 2016. 2. To achieve 100% therapeutic coverage by the end of 2015. 3. To reduce morbidity and disability due to LF by 25%(2016) 4. To interrupt transmission of LF by 2020.	<i>Global target:</i> Elimination of lymphatic filariasis as a public health problem by 2020. <i>Eritrean PELF targets:</i> To reduce the antigen prevalence of LF to less than 1% among endemic populations and 0% among children aged below 5 years, and reduce hydrocoele cases registered by 80% as well as manage 100% of lymphoedema cases registered by 2016.	Mass drug administration with DEC and Albendazole to all at risk Vector control within Malaria Control Disability management and prevention: Personal hygiene and exercises of affected limbs and Hydrocelectomies	Community Health Facility	1. ICT prevalence. 2. Program and geographical coverage
Schistosomiasis control Goal: Elimination as public health problem by 2020	To Eliminate as public health problem by 2020	1. To implement MDA in 100% of sub zones by 2016. 2. To achieve at least 75% therapeutic coverage during annual MDA 3. To eliminate	<i>Global target:</i> • To treat 100% of cases in health facilities • To achieve 75% therapeutic coverage in school age children.	-Case management in health facilities -Mass Drug Administration in the school-aged children -Health education and promotion of	Health Facility Community School	1. Scisto prevalence. 3. Program and geographical coverage

NTD PROGRAMME AND GLOBAL GOAL	NATIONAL TARGET	OBJECTIVES	TARGETS	STRATEGIES	DELIVERY CHANNELS	KEY PERFORMANCE INDICATORS
		infections of Scistosomiasis in school-age children and high-risk communities by 2020. 4. To reduce the prevalence of schistosomiasis in school-age children to zero.	<i>Eritrean targets:</i> Target and treat 80% of all school aged children in high risk areas.	behavioral change -Improvement in water supply and sanitation -Vector control		
Soil Transmitted Helminths Control Goal: To reduce morbidity of Soil Transmitted Helminths to a level where it is no longer a public health problem	Elimination as public health problem by 2020.	1. To implement MDA in 100% of sub zones by 2016.	<i>Global target:</i> <ul style="list-style-type: none"> To treat 100% of cases in health facilities To achieve 75% therapeutic coverage in school age children. <i>Eritrean targets:</i> Target and treat 80% of all school aged children in high risk areas.	-Case management in health facilities -Mass Drug Administration in the school-aged children -Health education and promotion of behavioural change -Improvement in water supply and sanitation	Health facilities. Community Community Community	1. Geographical and therapeutic coverage achieved. 2.Reduction in prevalence, intensity and morbidity 3. Latrine coverage and use. 4. Availability of safe water supply.
Trachoma Control Goal: Elimination as blinding disease by 2020.	Elimination as blinding disease by 2020.	1. To reach 100% of endemic communities with MDA by 2016. 2.To reduce the prevalence of Trichiasis trachoma (TT) in affected populations to less than 1%. 3.To reduce the prevalence of trachoma Follicular(TF) to less than 10% in affected populations.	<i>Global target:</i> The Global initiative is to eliminate Trachoma by the year 2020. <i>Eritrean trachoma programme targets:</i> To reduce the prevalence of active trachoma to less than 5% among children aged 1-9 years and the prevalence of trachomatoustrichiasis to less than 1 case per 1000 population above 15 years	Surgery of trichiasis cases Mass Drug Administration with Azithromycin of entire at risk identified communities. Personal hygiene reinforcing face washing Improved water supply for personal hygiene Health education and promotion of behavioural change	Health Facilities Community Community	1. Geographical and therapeutic coverage achieved. 2. No. of people with TT operated 3. Prevalence of TF. 4. % of children with clean face. 5. No. of health facilities offering TT surgeries.

NTD PROGRAMME AND GLOBAL GOAL	NATIONAL TARGET	OBJECTIVES	TARGETS	STRATEGIES	DELIVERY CHANNELS	KEY PERFORMANCE INDICATORS
Leishmaniasis Control Goal: Reduce the incidence of the disease as soon as possible, strengthening the network of surveillance.	To determine the burden of leishmaniasis. Eventually towards elimination program for VL	1.Determine the distribution and magnitude of leishmaniasis 2.Establish effective diagnosis and treatment capacities for leishmaniasis 3.Conduct operational research	<i>Global target:</i> Ultimate Elimination of Leishmaniasis. (NB: <i>Elimination program has been established in some countries for VL e.g. "VL elimination programme in India, Bangladesh and Nepal, 2005-2015)</i> <ul style="list-style-type: none"> To reduce morbidity and mortality due to Leishmaniasis To reduce transmission of leishmaniasis To map leishmaniasis in the endemic regions To prevent the emergent VL/HIV co-infection 	Early diagnosis and treatment of cases through ACD Integrated Vector Control Management Reinforce Operational Research for Leishmaniasis Facilitate combination therapies after WHO recommendations Early detection VL/HIV and follow-up Health Education and promotion for community awareness	Health Facility Community	1. No. of cases. 2. HIV co infection rate.
Leprosy Elimination Goal: Elimination as public health problem by 2020.	Leprosy Sustain Elimination by 2020 (Achieved at National level, but remaining at sub-national level)	1.To reduce the prevalence of leprosy in the community . 2.To reduce the disability due to leprosy.	<i>Global Target:</i> Reduction of the prevalence to less than 1 case per 10,000 inhabitants	Early diagnosis Adequate treatment (MDT)PB form: 6 months form: 12 months Prevention of disabilities Health Education (awareness creation)	Health Facility Community	1. No. of cases /10,000 inhabitants. 2. No. of leprosy cases with lesion.
Dengue Fever: Goal: Control of dengue fever	Dengue fever control by the year 2020	1. To control the breeding sites. 2.strengthen environmental sanitation 3.building capacity of health workers at HFS.	To reduce morbidity and mortality due to dengue fever.	1. Attacking breeding sites of mosquitoes. 2. Conducting environmental sanitation. 3. Health education.	Health facility Community	1. No. of cases in endemic sub zones. 2. Activities conducted attacking the breeding sites of mosquitoes.
Guinea worm Goal: Eradication by 2020	Maintain guinea worm disease free status of the country.	1, maintain zero transmission of guinea worm cases. 2, 100% containment of imported cases with in 24 hrs.	1. Strengthening community based surveillance system in all formerly endemic and at risk sub zones. 2. Capacity building for case containment for newly qualified health workers in all at risk sub zones.	1.Conducting continuous surveillance system in suspected sub zones. 2. Strengthening surveillance monitoring and evaluation.	Health facility and community based surveillance	1. Rumour cases investigated within 24 hrs. 2. No. of imported cases.

NTD PROGRAMME AND GLOBAL GOAL	NATIONAL TARGET	OBJECTIVES	TARGETS	STRATEGIES	DELIVERY CHANNELS	KEY PERFORMANCE INDICATORS
			3. Advocacy and social mobilization of communities in formerly endemic villages. 4. Strengthening surveillance monitoring and evaluation.			

2.4 National Milestones

LF ELIMINATION MILESTONES, 2015-2020

Indicators	2015	2016	2017	2018	2019	2020
Completed mapping of LF and determined LF endemic areas and the population at risk	39/39 (100%)					
Begun implementation of LF MDA in subzones requiring LF MDA	2/2 (100%)					
Achieving 100% geographical coverage in LF endemic subzones	2/2 (100%)	2 (100%)	2 (100%)	2 (100%)	2 (100%)	
Major urban areas with evidence of LF transmission under adequate MDA (Regional/State coverage more than 65%)	NA	NA				
Conducted more than 5 rounds of MDA in all endemic IUs with regional/State coverage more than 65% and stopped MDA in at least 50% of LF endemic IUs under WHO criteria					2/2 (100%)	2/2 (100%)
Conducted first TAS activities in at least 50% of LF endemic IUs after at least 5 rounds of MDA					2/2 (100%)	
Conducted and Passed at least 2 TAS activities in 75% of IUs					2/2 (100%)	
Started passive surveillance and vector control activities in at least 75% of IUs.			2/2 (100%)	2/2 (100%)	2/2 (100%)	2/2 (100%)
Present "the dossier " for in-country verification of absence of LF transmission					2/2 (100%)	
Proportion and number of IUs where there is full coverage of morbidity- management services and access to basic care				2/2 (100%)	2/2 (100%)	2/2 (100%)
Proportion and number of IUs where 75% of hydrocele cases benefitted from appropriate surgery				2/2 (100%)	2/2 (100%)	2/2 (100%)

SCH ELIMINATION MILESTONES, 2015-2020

Indicators	2015	2016	2017	2018	2019	2020
Completed mapping of SCH and determined areas above intervention threshold and the Endemic population	58(100%)					
Begun implementation of school-based/community-based treatments in Endemic subzones	28/28 (100%)					
Achieving 100% geographical coverage in SCH Endemic subzones		28/28 (100%)				
Conducted 3-5 years of consecutive treatments in all Endemic subzones with zonal/national coverage more than 75%				28(100%)		
Conducted first impact assessment activities in at least 50% of SCH Endemic subzones after at least 3 years of consecutive treatments			28/28 (100%)		28/28 (100%)	
Endemic subzones achieving moderate morbidity control	21/28 (75%)	28/28 (100%)	28/28 (100%)	28/28 (100%)	28/28 (100%)	
Endemic subzones achieving advanced morbidity control			28/28 (100%)	28/28 (100%)	28/28 (100%)	
Endemic subzones achieving elimination of transmission					28/28 (100%)	28/28 (100%)

STH ELIMINATION MILESTONES, 2015-2020

Indicators	2015	2016	2017	2018	2019	2020
Completed mapping of STH and determined areas above intervention threshold and the Endemic population	58 (100%)					
Begun implementation of school-based/community-based treatments in Endemic subzones	0/0 (100%)					
Achieving 100% geographical coverage in STH Endemic subzones	21/21 (100%)					
Conducted 3-5 years of consecutive treatments in all Endemic subzones with regional/State coverage more than 75%			0/0 (100%)	0/0 (100%)		
Conducted first impact assessment activities in at least 50% of STH Endemic subzones after at least 3 years of consecutive treatments			0/0 (100%)	0/0 (100%)		
Endemic subzones achieving moderate morbidity control		0/0 (100%)	0/0 (100%)	0/0 (100%)	0/0 (100%)	

Endemic subzones achieving advanced morbidity control		58 /58 (100%)	58/58 (100%)	58 /58 (100%)	58 /58 (100%)	
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TRACHOMA ELIMINATION MILESTONES, 2015-2020

Indicators	2015	2016	2017	2018	2019	2020
Completed mapping of trachoma and determined areas above intervention threshold and the target population	58 (100%)					
Begun implementation of community-based treatments in target subzones	8/8 (100%)					
Achieved 100% geographical coverage in trachoma target subzones	8/8 (100%)					
Conducted 3-5 rounds of treatments in all target subzones with regional/State coverage more than 75%	8/8 (100%)					
Conducted first impact assessment activities in at least 50% of trachoma target subzones after at least 3 rounds of treatments	8/8 (87.5%)					
Started passive surveillance in at least 75% of IUs.		6/8 (75%)	8/8 (100%)	8/8 (100%)	8/8 (100%)	
Proportion and number of target subzones where there is full coverage of case-management services	8/8 (100%)	8/8 (100%)				
Target subzones achieved elimination of blinding trachoma	6/8 (75%)			8/8 (100%)		

IDM CONTROL/ELIMINATION MILESTONES, 2015-2020

Indicators	2015	2016	2017	2018	2019	2020
Active Case detection in 100% of Highly endemic subzones	8 (100%)	8 (100%)				

Passive case detection in 100% of other endemic subzones	8 (100%)	8 (100%)				
Manage all patients in peripheral health facilities	8 (100%)	8 (100%)	8 (100%)			
Refer severe and complicated cases for management at subzone hospitals and reference centres	8 (100%)	8 (100%)	8 (100%)			
Achieved 100% geographical coverage of SAFE in trachoma target subzones	3 (37.5%)	5 (62.5%)	8 (100%)	8 (100%)		
Achieved 100% treatment coverage of identified leprosy cases	22 (100%)	22 (100%)	22 (100%)	22 (100%)		
Achieved 100% treatment coverage of identified cases for other CM-NTDs(Rabies, Leishmaniasis)	5 (12%)	15 (37%)	30 (73%)	41 (100%)	41 (100%)	
Started passive surveillance in at least 50% of target subzones for CM-NTDs targeted for elimination (Leprosy)	5 (%)	10 (%)	15 (%)	22 (%)	22 (%)	
Started sentinel site surveillance in at least 50% of target subzones for CM-NTDs targeted for elimination (Leprosy)	5 (23%)	11 (50%)	15 (68%)	22 (100%)	22 (100%)	22 (100%)
Target subzones that sustained elimination of leprosy	0 (%)	5 (23%)	11 (50%)	15(68%)	22(100%)	22(100%)

PHASE MILESTONES, 2017-2022

	Indicators	2017	2018	2019	2020	2021	2022
1	Proportion and number of Endemic subzones with adequate* access to clean water for SCH control	10 (33%)	15 (50%)	20 (67%)	25 (83%)	30 (100%)	30 (100%)
2	Proportion and number of Endemic subzones with adequate** sanitation manipulation for SCH control	5 (17%)	10 (33%)	15 (50%)	20(67%)	25(83%)	30 (100%)
3	Proportion and number of Endemic subzones with adequate*** environmental manipulation for SCH control	0 (%)	2 (7%)	5(17%)	10(33%)	15(50%)	20(67%)
4	Proportion and number of Endemic subzones with adequate access to clean water and health education for STH control	10 (33%)	15 (50%)	20 (67%)	25 (83%)	30 (100%)	30 (100%)

5	Proportion and number of Endemic subzones with adequate** sanitation for STH control	5 (17%)	10 (33%)	15 (50%)	20(67%)	25(83%)	30 (100%)
6	Proportion and number of Endemic subzones with adequate*** environmental manipulation for STH control	0 (%)	2 (7%)	5(17%)	10(33%)	15(50%)	20(67%)

PART 3: OPERATIONAL FRAMEWORK

This section of the Master Plan was developed in consultation with stakeholders to ensure harmonized and effective NTD program implementation. This section describes how the planned activities will be implemented using the available resources taking into account the potential risks in order to sustain and secure the achievements made.

3.1 Scaling up access to NTD Interventions, treatment and service delivery capacity

With initiative of the Ministry of health, findings from studies that were conducted and based on the current WHO recommendations and guidelines; a detailed description of the activities for scaling up the NTD Program was developed. The three main packages of interventions addressed were:

- Preventive chemotherapy
- Case management/chronic case
- Integrated vector management and other “PHASE”* interventions for the targeted NTDs.

3.1.1 Scaling up preventive chemotherapy interventions

The most common NTDs that need Mass Drug Administration (MDA) are, Lymphatic Filariasis, Trachoma, STH and Schistosomiasis. The plan is to use Community and school based campaigns to address the sub zones that are mapped and found to be positive for these diseases. The type of MDAs to be implemented is detailed in table 9 and also in annexes 2.3 and 2.4. In addition to implementing the proposed MDAs and scaling up the interventions various activities such as training, sensitization, supervision and drug administration will be conducted (Table 10).

Table 9: Types of mass drug administration

Cross-cutting MDA types	Delivery channels	Timing of treatments	Disease combination	Requirements	Target (Sub zobas) list	Other mass disease control interventions

Cross-cutting MDA types	Delivery channels	Timing of treatments	Disease combination	Requirements	Target (Subzobas) list	Other mass disease control interventions
MDA2 (One annual round of DEC and albendazole)	<ul style="list-style-type: none"> Community-based campaigns School based campaign 	Annually	Lymphatic filariasis,	<ul style="list-style-type: none"> Training of Trainers Training of health personnel Training of community volunteers 	Forto Araata	Vitamin A campaigns ITN distribution
T1(One annual round of prizaquintel + Albendazole)		Annually	Schistosomiasis/STH	<ul style="list-style-type: none"> Training of teachers Social mobilization of local administrators and village elders; Mass media Supervision Production of tools Logistics for drug distribution and management 	AdiTekele zan Halhal Hagaz Habero Hamelmal o Keren Kerkebet Selaa AdiQuala AdiKeih Areza Debarwa Dekemhare Imnihaili Mai Aini Mai mine Mendefera Segeneity Senafe Tsorona Berik Debubawi Mibrak Gala Nefhi Serejeka	
MDA4 (One annual round of with azithromycin + Tetracycline eye ointment for under 2 children)	Community based	Annually	Trachoma	<ul style="list-style-type: none"> Training of Trainers Training of health personnel; Training of 	Debaruwa Areza Mai Mine	

Cross-cutting MDA types	Delivery channels	Timing of treatments	Disease combination	Requirements	Target (Sub zobas) list	Other mass disease control interventions
				community volunteers • Social mobilization of local administrators and village elders; • Mass media • Supervision		

MDA4 = Azithromycin and TTC eye ointment for under 2 children

T1= Praziquantil + Albendazole

T2 = Praziquantel only

T3 = Albendazole or mebendazole only

MDA2 = DEC + Albendazole

Table 11: Packages for Case management and chronic care

Cross-cutting interventions	NTDs targeted	Requirements	Other non-NTD opportunities for integration
Hydrocele surgery (hydrocelectomies) Trichiasis surgery	Lymphatic filariasis hydrocele, Trachomatous Trichiasis (TT)	<ul style="list-style-type: none"> • Training of Medical Doctors and nurses • Hospitals facilities or appropriate basic facilities with good surgical facilities • Follow up/supervision 	Capacity building for basic surgery at the sub zoba level
-Daily hygienic washing of affected limbs. -Exercise of affected limbs -Application of	Elephantiasis/lymphedema Leprosy disability	<ul style="list-style-type: none"> • Washing kits (bucket, towel, soap, clean water, autoclave machines at local health facilities) • Procuring prosthesis for disability due to leprosy 	HIV/AIDS social support groups. Diabetes support groups Malaria home management

antibiotic creams to affected limbs - skin care		<ul style="list-style-type: none"> • Antibiotics/Vaseline creams • Training of first-line health/community workers, patients and family members • Social support clubs/groups • Follow up/ Supervision 	Community TB DOTS
Hospitalized treatment (Leishmaniasis) Self-administering MDT treatment (leprosy)	Leprosy, Leishmaniasis, Rabies, Anthrax, Brucellosis, Dengue fever, Hydrocele	<ul style="list-style-type: none"> • Specific drugs (tablets and injectable) • Hospitalization facilities • Close monitoring during treatment (in case of Leishmaniasis) • Training of medical staff • Follow up/ supervision • Patient support (financial e.g. transportation to health facility) • Nutritional support 	Malaria home case management Community TB DOTS Women's associations (CL and MCL)

Table 10: Activities for strategic priority 1 –Scale up Access to PCT interventions

<i>Strategic Objective 3.1.1: Scale up an integrated preventive chemotherapy, including access to Lymphatic filariasis, STH, Schistosomiasis and trachoma interventions and reach elimination of the mentioned diseases by 2020</i>			
Activity	Details (Sub-activities)	Time frame	Resources needed
1.Training	I Training at national level for zoba focal persons	2015-2020	Personnel, meals, stationery, hall hire, transport, per-diems stationery, transport
	ii. Training at Zoba level for the sub zoba	2015-2020	
	iii. Training at sub-Zoba level for health facilities	2015-2020	
	iv. Training of Teachers and Supervisors/sub-Zoba health staff (sub-Zoba level)	2015-2020	
	v. Training of community health agents(CHA)	2015-2020	
2.Community Sensitization and mobilization	i. Sensitization of Zoba leaders	2015-2020	Personnel, Perdiem, hall hire, meals, stationery, transportation, IEC materials
	ii. Community Sensitization	2015-2020	
	iii. Health Education and Mobilization	2015-2020	
3.Distribution of medicines	i. Registration of Pupils and Communities	2015-2020	Transport reimbursement, communication, registers, stationery, allowances
	ii. Supervision of registration of pupils and communities		
	iii. Medicines delivery from the National pharmacy store to Zoba	2015-2020	Personnel
	iv. Distribution of medicines to sub-Zoba and to health Stations or Clinics	2015-2020	Personnel
	v. Medicines Delivery (to schools and communities)	2015-2020	transportation, personnel and allowances
	vi. Supervision from National	2015-2020	Personnel, supervisors, IEC materials, dose poles and treatment charts
	vii. From zoba level		
	viii. Feedback meetings after some interventions	2015-2020	Perdiem, hall hire, meals, participants, transport
	x. Annual Review at national level	2015-2020	reimbursement.

3.1.2 Scaling up NTD Case management Interventions

The NTDs that require case management include LF, Trachoma, Leprosy, Leishmaniasis, Rabies, Dengue and Anthrax. The detailed activities that are proposed for scale-up of detection and management of these diseases are described in table 11.1 and annex 2.2.

Table 11.1: Activities for case management interventions

<i>Strategic Objective 3.1. 2: Eradicate LF and eliminate trachoma, leprosy, rabies, anthrax and dengue by 2020 by scaling up case management interventions.</i>			
Activity	Sub-Activities	Time Frame	Resources needed
1. Training of Trainers (TOTs)	i. National ToT	2015, 2017, 2019	Training modules, allowances,
	ii. Zoba ToT	2015, 2017, 2019	LCD Projector and stationery
2. Training of HWs at sub-zoba level in case management	i. Training of clinicians on TT surgery	2017-2020	Allowances, Hall hire, stationary, access to local hospital operating rooms
	iii. Special training on lymphoedema management	2017 – 2020	Allowances, Hall hire, Stationary
3. Training of Community Health Workers (CHWs) in case management NTDs	i. Develop training guide on CM-NTDs	2017	Allowances, Hall hire, stationery
	ii. Train CHWs on detection and morbidity management of CM-NTDs and referrals	2017-2020	Allowances, Hall hire, stationery. Transportation
4. Surgery for Trichiasis (Surgical camps)	TT surgical camps in 7 sub-Zobas	2017-2020	Allowances, transportation, and disposable supplies
	Supportive supervision by the center during surgical camps	2017-2020	
5. Lymphoedema management	Lymphoedema management in 2 sub-	2017-2020	Allowances, transportation and disposable

	Zobas		supplies
6. Equip laboratories for Case detection	i. Training of Laboratory staff in all sub-Zobas ii. Procure lab equipment and reagents	2017-2020	Kits for leishmaniasis, RDT for dengue, test kit for brucellosis Microscopes, haematocrit centrifuges, generators, lab reagents allowances, transportation
7. Provision of drugs	i. Procurement, clearance and delivery of drugs	2017-2020	Budget for procurement of IDM Drugs
8.Support supervision	i. Develop a support supervision tool/checklist ii. Conduct supportive supervision quarterly	2017-2020	Personnel,
			Allowance, transportation
9.Mapping	i. Mapping of Trachoma in 2 sub-zobas	2017	Allowances , transportation, field and laboratory sundries
	ii. Active case finding of Leprosy	2017-2020	
	Active case finding of leishmaniasis	2017-2020	
	LF transmission assessment survey	2017-2020	

3.2 Scaling up NTD transmission control interventions

In order to control and eliminate the NTDs, an integrated approach to vector control and other PHASE activities which are crosscutting, will be implemented in all the sub-Zobas. The Ministry has scaled up LLINs and IRS in malaria endemic Zobas. In addition to this, the MoH will intensify the implementation of the SAFE strategy for the control of

Trachoma. Already some villages across the country have achieved the outdoor defecation-free status. These cross cutting interventions are detailed in table 12 and in annexes 2.6 and 2.7, while the key activities that will be carried out to implement the transmission control packages are as shown in table 13.

Table 12: Intervention packages for Transmission control

Cross-cutting interventions	NTDs targeted	Requirements	Other non-NTD opportunities for integration
Mosquito and sand fly control using: <ul style="list-style-type: none"> • insecticide treated nets (ITN) • In-door residual spraying (IRS) • Environmental management • Biological control • Health Education 	Lymphatic filariasis Leishmaniasis Dengue	<ul style="list-style-type: none"> • ITNs, and insecticide treated materials (ITM) • Insecticide chemicals • Larviciding chemicals • Plastered walls, others 	Malaria vector control
<ul style="list-style-type: none"> • Improved access and quality of water supply. • Improved sanitation facilities • Environmental management • Health Education • Personal Hygiene 	Schistosomiasis Soil transmitted helminthes Trachoma	-Sinking bore-holes -Building latrines -Health Education & Promotion.	-Developmental programmes (e.g. water & sanitation) -School health and Nutrition programmes <u>Community Led Total Sanitation (CLTS)</u> Environmental health

Table 13: Activities for disease transmission control

<i>Strategic objective 3: Strengthening integrated vector management and other “PHASE”* interventions for the targeted NTDs.</i>			
Activity	Details (Sub-activities)	Timeframe	Resources needed
1. Developing tools	i. Finalize the integrated vector management policy	2017	Stationary, allowances, hall hire, transportation, technical assistance
	ii. Develop guidelines for integrated vector management	2017	Stationary, allowances, hall hire, transportation
	iii. Development of training modules and IEC Materials (including radio	2017	

	and TV spots)		
2. Training	i. Training of National trainers	2015, 2017, 2019, 2020	Training modules, allowances, hall hire stationary,
	ii. Training of Zoba and Sub-Zoba level trainers	2015, 2017, 2019, 2020	
	iii. Training of Spray operators and WASH persons	2017 – 2020	
	iv. Training on entomology	2017- 2020	
3.Procurement of supplies	i. Procure integrated vector management supplies and equipment	2017 – 2020	Spray pumps, insecticides/larvicides, personal protective gear
4.Community sensitization on integrated vector management	Conduct Zoba and Sub-Zoba IEC/BCC activities	2017 – 2020	Personnel, Perdiem, hall hire, meals, stationery, transportation, IEC materials
	ii. Zoba and Sub-Zoba IRS Advocacy meetings	2017- 2020	
	iii. Sub-Zoba leaders' sensitization meeting	2017 – 2020	
	iv. Community Leader's & CHWs sensitization meetings	2017- 2020	
	v. Media sensitization and advocacy	2017 – 2020	
	Vi. Develop and air radio and television NTD messages	2017-2020	Air time,
	vii. Community mobilization for IVM	2017- 2020	Transportation, allowances, stationery, hall hire
5. Conduct Operational Researches	i. Conduct Sub-Zoba needs assessment for IRS	2017 -2019	Transportation, allowances, communication ,equipment
	ii. Micro planning and TOT workshop on IVM	2017 – 2020	
	iii. Baseline entomological studies	2017	
	iv. Baseline epidemiological studies	2017	
	v. Chemical exposure assessment of spray operators	2017 – 2020	
	vii. Post-IRS entomological studies	2018 – 2020	
	viii. Post-IRS epidemiological studies	2018 – 2020	

6. Other PHASE interventions	Conduct source reduction (filling and destroying breeding sites)	2017 – 2020	Transportation, allowances, equipment and supplies, communication
	Larviciding of breeding sites	2017 – 2020	
	Training on house hold community water treatment using sedimentation, filtration, etc	2017 – 2020	
	Health education on vector behavior, sanitation and environmental management	2017 – 2020	
	Support construction of pit latrines	2017-2020	Collaboration with environmental health division
7. Monitor and evaluate impact of on-going IRS PHASE activities	i. Monitor quality of IRS using bio-assay tests	2017 - 2020	Monitoring tools, transportation, allowances, equipment and supplies
	ii. Entomological evaluation studies	2019	Evaluation tools, transportation, allowances, equipment and supplies
	iii. Epidemiological evaluation studies	2019	
	iv. Latrine utilization surveys	2017	Survey tools, transportation, allowances, equipment and supplies
	v. KAP surveys on hygiene and sanitation	2017	Survey tools, transportation, allowances, equipment and supplies
	vi Conduct dissemination work shops	2019-2020	Stationery, allowances, transportation, airtime

- PHASE: Preventive chemotherapy, Health education, Access to safe drinking water, Sanitation and hygiene, and Environmental improvements

3.3Pharmacovigilance in NTD control activities

This section provides information and details on preparedness of the national pharmacovigilance system and NTD programme management to ensure satisfactory reporting and management of adverse side effects/ events that may be linked to NTD interventions under the programme setting. Activities for strengthening relationship of NTDs with pharmacovigilance are listed in table 14.

Table 14: Activities for strengthening pharmaco-vigilance in NTD programme.

<i>Strategic Objective 3.3.1 : To strengthen the existing functional Pharmacovigilance(PV) to include NTD programme</i>			
Activity	Details (Sub-activities)	Timeframe	Resources needed
Equip the National Pharmacovigilance Centre with training materials and the required reporting tools	Support Pharmacovigilance unit to Re-print and distribute training materials, adverse drug reaction (ADR) reporting forms.	2017 - 2020	Consensus building workshop expenses, Printing costs, workshop (Stationeries, venues, DSA and Refreshment, transportation costs, communication costs) and dissemination costs.
Sensitization programme on the role of pharmacovigilance in NTD Control	Train all health professionals on Pharmacovigilance principles in the NTD programme.	2017- 2020	Transportation, hotel accommodations, DSA, venues, refreshment, meals and stationary materials.
Monitoring and Evaluation of the Pharmacovigilance system	. Annual National workshop for the PV review	2017 – 2020	Accommodation, transportation, allowance for the monitoring group (4) Accommodation, transportation, allowance, and stationary materials for the workshop participants
Attend international meetings, trainings and conferences	Attend regional and international meetings, trainings and conferences related to pharmacovigilance activities in NTD Control	2017 – 2020	Accommodation, airfare and DSA for participants
Conduct Study Tour	Study tour of the PV and NTD staff to experienced countries	2017 or 2018	Accommodation, airfare and DSA for participants
Workshop for integrated work plan	Annual National workshop for integrated work plan between Pharmacovigilance Unit and National NTD programme	2017 – 2020	Accommodation, transportation, DSA, Venues and stationary materials for the workshop participants
Quality Assurance (QA) of Medicines used for MDA in WHO prequalified Laboratories	Send samples of the medicines used for MDA in NTD Control to WHO accredited laboratory for quality test	Periodically (once every two years)	Quality test fee & Transportation fee (DHL)
Conduct	Conduct Cohort Event	2017, 2019	Develop pre and post

operational research on patient safety	Monitoring of current interment medicines during MDA		questionnaires Recruit 10% of the population involved in MDA Follow patients with telephone call and in person Data management and dissemination
Develop Risk Management and Risk minimization plan	Draft risk minimization plan during MDA	2017	No Resource needed

3.4 Strengthening Capacity at National Level for NTD programme management and implementation

This section focuses on activities that will be implemented and the resources required to strengthen the management and operational capacities of the NTD programme staff at various levels. This is required to scale up and achieve elimination goals. The details are as presented in table 15. Table 16 shows the scaling up/down of IDM and PCT NTDS.

Table 15: Activities and resources needed for strengthening capacity for NTD programme

<i>Strategic objective 3.4.1: Strengthening capacity at national level for NTD programme management and implementation.</i>			
Activity	Details (sub-activities)	Time frame	Resources needed
Leadership and management training	Identification of trainees and trainers, period, places and funds	2017	Financial Training institutions
Office equipment and vehicles	Equip HQ and Zoba NTD offices with office equipment (Lap tops, furniture, LCDs, etc)	2017	Furniture (4 office sets), lap tops (12), desk tops(12), LCDs(8), Specifications Printer and toners(12) 2 vehicles (land cruisers)
Laboratory diagnosis	1. Identification of trainees and trainers 2., Conduct training on how to maximize detection 3. Procure lab supplies and reagents,	2017- 2020	
Data management	Identification of trainees and trainers, period, places; funds identification; consensus on software	2017, 2018 (Refreshment trainings)	Computers, software, training related costs as above,

Table 16: Scaling up/scaling down plan.

NTD	Total No. sub zobas requiring MDA	Total at risk population	2015 No. Sub zobas and Total population to be treated	2016 No. Sub zobas and Total population to be treated	2017 No. Sub zobas and Total population to be treated	2018 No. Sub zobas and Total population to be treated	2019 No. Sub zobas and Total population to be treated	2020 No. Sub zobas and Total population to be treated
PCT IMPLEMENTATION (MDA)								
LF	2	87250	87250	89431	91667	93958	96307.67	98715
SCH	28	1,036,717	1,062,635	1,089,201	1,116,431	1,036,717	1,036,717	1,036,717
STH	21	1,036,717	1,062,635	1,089,201	1,116,431	1,036,717	1,036,717	1,036,717
Trachoma								
IDM IMPLEMENTATION								
Dengue fever	45	3,052,343	45	50	30	18	11	6
			12,503	11253	6752	4051	2431	1458
LEISH	11	1,257,538	11	12	7	4	3	2
			182	200	120	72	43	26
Leprosy	5	574,124	5	6	3	2	1	1
			18	20	12	7	4	3

3.5 Enhancing planning for results, Resource Mobilization and Financial Sustainability

For successful implementation of the NTD Master Plan it is important to ensure development of practical strategies that will guarantee adequate resource mobilization for financial sustainability. Moreover a good accountability system for resource monitoring and control in a transparent manner based on justifiable evidence is of prime importance. In this document, some key activities have been identified to enable the achievement of the four strategic objectives for enhancing planning for results, resource mobilization and financial sustainability of the NTDP. These activities are shown in table 17.

Table 17: Activities for implementing Strategic Priority 2: Enhance planning for results, resource mobilization, and financial sustainability of national NTD programmes.

<i>Strategic objective 3.5.1: To develop integrated multiyear strategic plan and gender-sensitive annual operational plans for the control, elimination and eradication of targeted NTDs</i>			
Activity	Details (sub-activities)	Time frame	Resources needed
1. Review and launch the new NTD master plan	i. Workshop to Revise the NTD Master plan	2020	Allowances, accommodation, hall rental, meals, stationaries.
	ii. Hold all NTDs stake holders meeting including from zones	2017	
2. Development of operation work plans	i. hold meetings to develop national annual gender sensitive operational plans	2017	Resource persons and participants, allowances, accommodation, hall rental, meals, assorted stationary.
<i>Strategic Objective 3.5.2: Enhance resource mobilization approaches and strategies at international, national and zonal levels for NTD interventions.</i>			
1. Develop an NTD resource mobilization strategy.	i. Hold meeting to develop resource mobilization strategy.	2017	Resource persons and participants, allowances, accommodation, hall rental, meals, assorted stationary, communication cost
2. Implementation of the resource mobilization strategy.	ii. Hold meeting with multi-lateral, bilateral and all NTD key stakeholders.	2017-2020	
	iii. Periodically update the resource mobilization strategy.	2017-2020	Personnel

<i>Strategic objective 3.5. 3: Strengthen the integration and linkages of NTD programme and financial plans into sector-wide and national budgetary and financing mechanisms</i>			
Advocacy and sensitisation	i. Conduct advocacy visits to NTD relevant stakeholders, including Ministry of Finance and Ministry of Development.	2017-2020	Personnel
	ii. Conduct sensitization meetings to NTD relevant stakeholders	2017-2020	Resource persons and participants, allowances, hall rental, meals, stationaries.
<i>Strategic Objective 3.5. 4: Develop and update national NTD policies and elaborate guidelines and tools to guide effective policy and program implementation.</i>			
1. Review and update the National health policy to including the NTDs	Consult MoH to update the national NTD Policy	2017	
2. Develop/update integrated NTD guide lines and tools	Organize meetings to develop/update NTD guidelines and tools.	2017	
	Organize meetings to disseminate the guidelines and tools.	2017	No resource needed

3.6 Strengthening Government Ownership, Advocacy, Coordination and Partnerships

It is important to ensure government ownership of the programme and effective coordination of all partners with clear roles and responsibility of each one. NTD control strategies will be incorporated into the national and subnational health plan as well as into health service delivery in the facilities, education and other relevant areas. Community engagement and participation are critical to sustainability of the interventions. The NTD structure (Steering committees, task forces and secretariats) will review with stakeholders the progress. The role of the media is also very important in dissemination of accurate information on NTDs across the entire country. Table 18 list the activities that will be implemented to insure the achievements of the above strategic priorities. In order to insure

Table 18: Activities for implementing Strategic priority 1: Strengthen government ownership, advocacy, coordination, and partnership.

<i>Strategic objective 3.6.1: Strengthen coordination mechanism for the NTD control programme at national and sub-national levels</i>			
Activity	Details (sub-activities)	Time frame	Resources needed
1. Strengthening National coordination mechanisms	Strengthen NTD steering committees and secretariat at National level	2017	Personnel
	Hold quarterly meetings	2017-2020	Allowances, accommodation, hall rental, meals, assorted stationary.
2. National Stakeholders NTD review meeting	All stakeholders meeting including MoH high officials and other line ministry high officials.	2017-2020	Allowances, accommodation, hall rental, meals, assorted stationary.
<i>Strategic objective 3.6.2: Strengthen and foster partnerships for the control, elimination and eradication of targeted NTDs at national, sub zoba and community levels</i>			
1. Update potential NTD partners list in the country.	i. Identify NTD related partners.	2017	Personnel
2.Strengthen partnership	i. Make advocacy meetings to involve more partners in NTD control	2017	Hall rental, meals, assorted stationary.
<i>Strategic objective 3.6.3: Enhance high level reviews of NTD programme performance and the use of lessons learnt to enhance advocacy, awareness and effective implementation</i>			

1. Conduct annual review meeting.	i. Annual stakeholders meeting for reviewing program performance	2017 -2020	allowances, accommodation, hall rental, meals, assorted stationary.
	ii. Documentation of program performance and dissemination	2017 -2020	Personnel, stationery, communication cost, postal services, printing and dissemination

3.7 MONITORING & EVALUATION

Monitoring and evaluation activities are critical steps in tracking progress of programme implementation. It requires continuous observation and data collection on NTD programme and systematic and critical analysis of the adequacy, efficiency and effectiveness of the programme and its strategies. Continuous supervision is required and programme evaluation at midterm and at the end of the programme will be conducted to assess performance in relation to the goals, objectives and set targets. Table 19 below describes the activities, sub-activities, time frame and resources needed to achieve the four strategic objectives.

Table 19: Strategic priority 4: Enhance NTD monitoring and evaluation, surveillance and operation research.

Strategic Objective 3.7.1: Develop and promote an integrated M&E framework and improve monitoring of NTDs, within the context of national health information systems			
Activity	Details (sub-activities)	Time Frame	Resources Needed
Develop an integrated NTD M&E framework	Develop an M&E tool	2017	Training, Experts/honorarium, Stationeries, venues, DSA and Refreshment, communications cost, transportation costs,
	Field testing, training on the forms	2017	
		Printing of M&E tool	2017
Monitor drug management inventory and logistics		Annually	Experts/honorarium, Stationeries, venues, DSA and Refreshment, communication cost transportation costs,
Strategic Objective 3.7.2: Strengthen and foster partnership for the control, elimination and eradication of targeted NTDs at national, zonal, sub-zonal and communities.			
Monitor the coordination and implementation activity of NTD unit	Develop checklist for monitoring indicators, conduct annual monitoring of activities against set indicators	2017-2020	develop and print checklist, Stationeries, DSA and Refreshment, transportation costs, communication costs,
Monitoring resource use	Tracking of appropriate availability and use of resources; financial report	Annually	transportation costs, communication costs,

<i>Strategic Objective 3.7.3: Strengthen surveillance of NTDs and strengthen response and control of epidemic prone NTDs, in particular Dengue and Leishmaniasis, and other IDM NTDs</i>			
Strengthen existing reference lab for NTDs	Set up NTD lab in Asmara	2017	Experts/honorarium, Commodities/equipment, reagents and supplies, transportation costs,
Strengthen cross border surveillance activities	Cross border advocacy, Identify joint sentinel sites for NTD surveillance; Joint community sensitization; joint supervision,	2017	transportation costs, communication costs, venues, DSA, refreshment,
Strengthen integrated NTD surveillance structures and mechanisms	Integrate NTDs in the IDSR guidelines	2017	Stationeries, venues, DSA and Refreshment, transportation costs, communication costs (mobile phones, internet connections, computers)
<i>Strategic Objective 3.7.4: Establish integrated data management systems and support impact analysis for NTD in the WHO African Region as part of the global NTD data management system and global NTD plan</i>			
Establish/strengthen integrated data management system	Develop and produce reporting forms, software, field test, conduct trainings,	2017	Trainings, field testing, Experts/honorarium, printing forms, Stationeries, venues, DSA and Refreshment, transportation costs, software, communication costs,
	Identify and train NTD Data focal persons	2017	Trainings, field testing, Experts/honorarium, printing forms, Stationeries, venues, DSA and Refreshment, transportation costs, software, communication costs,
Conduct impact assessment for NTDs	Develop integrated protocol for impact assessment; conduct treatment coverage impact survey, share best practices	2018	Training, Experts/honorarium, Commodities, workshop (Stationeries, venues, DSA and Refreshment, transportation costs, communication costs); survey cost; dissemination costs of results,
Report and provide NTD data to AFRO	Compile report and submit to WHO and MoH	2017-2020	No resource needed

3.8. Post intervention surveillance and integration within Primary Health Care

It is important to ensure that the gains made are sustained by establishing a strong post-intervention surveillance and integration of the NTD programme into the primary health care. This Master plan will integrate the activities at the subnational levels of the health care delivery system to ensure routine practice. Surveillance activities will also be integrated into the national HMIS.

The activities to be implemented and the resources needed are elaborated in table 20.

Table 20: Activities for surveillance and sustainability

<i>Strategic objectives:3.8.1 Strengthen and sustain the surveillance of NTDs and the response and control epidemic –Prone IDM NTDs(dengue, leishmaniasis leprosy, Rabies, brucellosis and anthrax</i>			
Activity	Details (Sub-activities)	Timeframe	Resources needed
Build capacity	review and update training manuals	2018	personel
Strengthen cross border collaboration	Meeting with NTD affected neighboring countries	2017-2020	Meeting cost (stationeries ,Venues, DSA and refreshment transportation costs, Communication costs
Conduct supportive supervision	Identify sentinel sites for periodic spots checks	2017-2020	DSA and refreshment, transportation cost, communication cost, printing cost

Contact addresses:

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Department of Public Health
Ministry of Health
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Asmara, Eritrea
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ANNEXES

Annex 1.1 Summary population table

National population data, schools, and health facilities at sub zoba level

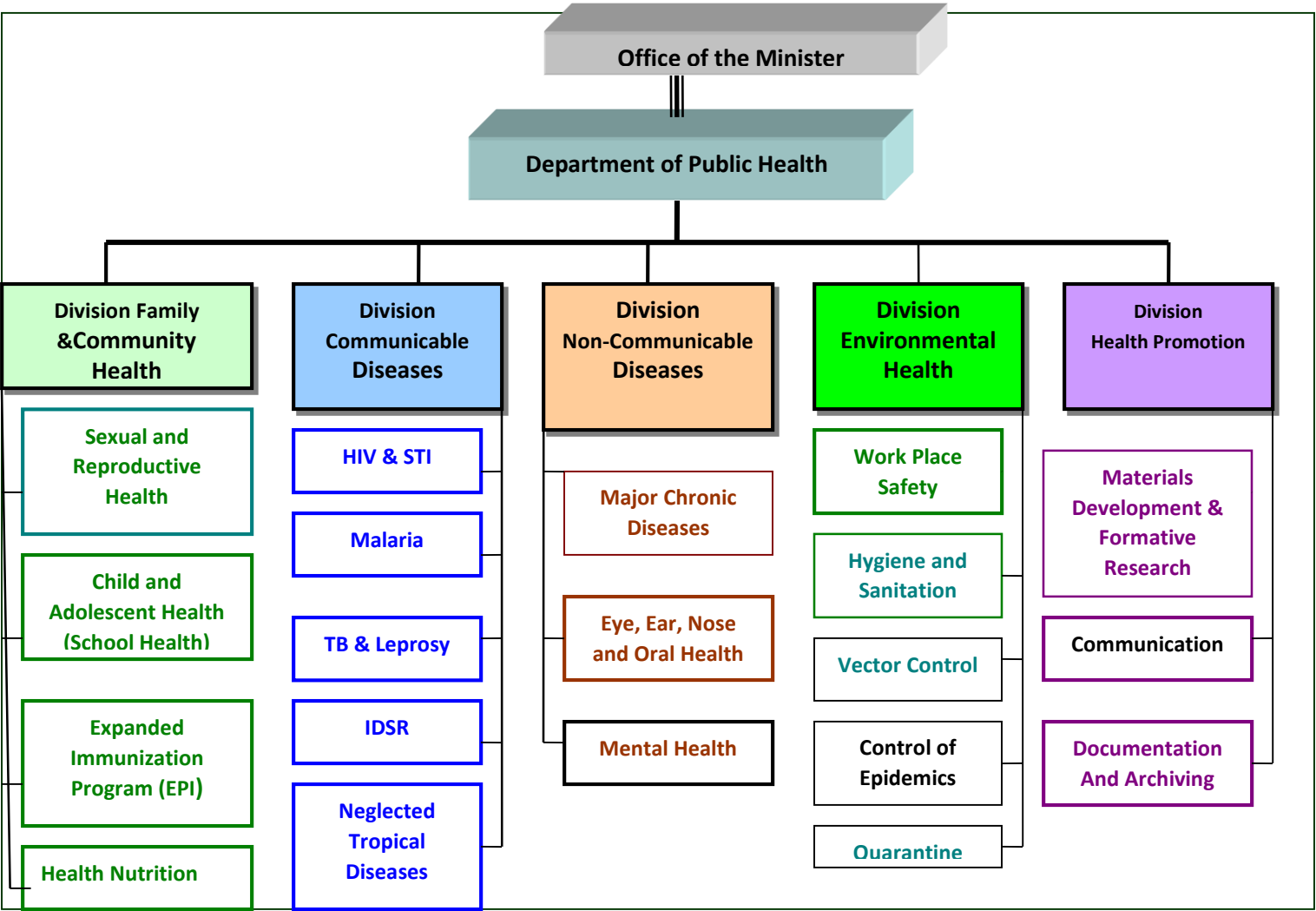
Zone	Sub-Zone	No. of villages	Total population	Under-fives (13.7)	5-14 years (29.2%)	No. of primary schools	No. of peripheral health facilities
Anseba	Elabered	55	68,119	9332	19891	22	4
	Geleb	39	48,417	6633	14138	10	2
	Keren	52	106,602	14604	31128	30	7
	Hagaz	81	90,342	12377	26380	18	67
	Halhal	29	71,441	9787	20861	9	3
	Habero	36	65,328	8950	19076	10	4
	Asmat	27	49,130	6731	14346	8	3
	Kerkebet	55	40,147	5500	11723	9	4
	Sela	22	13,742	1883	4013	7	1
	AdiTekelizan	37	45,655	6255	13331	9	1
	Hamelmalo	41	37,738	5170	11019	11	3
	Zonal population		636,661	87223	185905		38
Debub	Debarwa	81	124,667	17079	36403	25	8
	Areza	104	114,635	15705	33473	25	7
	Mendefera	68	80,041	10966	23372	16	4
	Dekemhare	46	70,312	9633	20531	26	6
	Segeneiti	39	69,454	9515	20281	21	6
	Adi Keyih	99	112,111	15359	32736	21	6
	Senafe	120	51,845	7103	15139	27	8
	Tsorona	88	116,724	15991	34083	13	7
	Adiquala	109	81,245	11131	23724	20	4
	Emni-Haili	100	81245	11131	23724	22	3
	Mai-Aynnee	59	54156	7419	15814	12	3
	Mai-Mine	73	91074	12477	26594	14	3
	Zonal population		1,047,509	143509	305873		65
DKB	Areta	48	27,434	3758	8011	8	4
	Makelay Keyih Bahri	21	19,152	2624	5592	3	3
	Debub Denkalia	34	16,209	2221	4733	6	5
	Asseb	6	29,600	4055	8643	5	2
	Zonal population		92,395	12658	26979		14
Gash Barka	Agurdet	103	43,326	5936	12651	15	6
	Barentu	39	29,018	3975	8473	16	7
	Dighe	88	57,239	7842	16714	11	6
	Forto	84	59,816	8195	17466	14	5

	Gogne	54	59,269	8120	17307	13	2
	Haycota	91	62,883	8615	18362	13	4
	LogoAnseba	22	53,055	7269	15492	16	5
	Mensura	26	80,143	10980	23402	16	5
	Mogolo	21	31,457	4310	9185	11	3
	Guluj	48	76,673	10504	22389	20	9
	Shambuko	38	47,655	6529	13915	19	4
	Mulki	61	49,517	6784	14459	13	5
	Teseney	62	59,665	8174	17422	18	6
	Laalay Gash	89	76,673	10504	22389	24	6
	Zonal population		786,389	107735	229626		73
Maakel	Serejeka	28	77,028	10553	22492	17	8
	Berikh	22	62,331	8539	18201	16	3
	Ghalanefhi	32	66,537	9116	19429	23	6
	North east Asmara	4	159,896	21906	46690	13	4
	North west Asmara	3	156,395	21426	45667	14	3
	South west Asmara	3	117,217	16059	34227	8	9
	South East Asmara	3	111,016	15209	32417	18	4
	Zonal population		750,420	102808	219123		37
SKB	Ghelealo	46	34,790	4766	10159	18	5
	Foro	58	66792	9151	19503	12	4
	Dahlak	12	4,254	583	1242	6	3
	Massawa	15	49,608	6796	14486	11	10
	Ghindae	25	89,433	12252	26114	19	10
	Shieb	10	76,520	10483	22344	8	2
	Afabet	49	145,644	19953	42528	14	5
	Nakfa	33	76,872	10531	22447	11	4
	Adobha	18	33,645	4609	9824	3	3
	Karora	22	61,856	8474	18062	8	4
	Zonal population		639,414	87600	186709		50
	National population		3,952,788	541532	1154214		277

Annex 1.2. Distances between Asmara and major cities in the country

Asmara													
60	Mendefera												
92	32	Adi quala											
40	44	76	Dekemhare										
110	114	146	70	Adi keyh									
135	139	171	95	25	Senafe								
91	151	183	131	201	226	Keren							
172	232	264	212	282	307	81	Akurdet						
202	262	294	242	312	337	30	30	Barentu					
357	417	449	397	467	492	266	185	155	Tesseney				
157	217	249	197	267	292	66	147	96	514	Afabet			
227	287	319	267	337	362	136	217	166	584	70	Nakfa		
155	215	247	195	265	290	246	327	357	512	312	382	Massawa	
705	765	797	745	815	840	796	877	907	1062	862	932	550	Assab

Annex 1.3: Organizational chart of the MoH and the NTD National Programme



Annex 1.4: Summary on available data of PCT-NTD distribution

Province or region	District or community*	LF	SCH	STH	Trachoma
Anseba					
	Hagaz	NO	NO	YES	YES
	Adi-Tekelezan	NO	YES	YES	YES
	Asmat	NO	NO	NO	ND
	Elaberd	NO	NO	NO	YES
	Geleb	NO	NO	NO	YES
	Habero	NO	NO	YES	YES
	Halhal	NO	YES	YES	YES
	Hamelmallo	NO	NO	YES	YES
	Keren	NO	NO	YES	YES
	Kerkebet	NO	NO	YES	ND
	Selea	NO	NO	YES	ND
	Total Anseba	0	2	8	8
Debub					
	Adequala	NO	YES	YES	YES
	Adikeih	NO	YES	YES	YES
	Areza	NO	YES	YES	YES
	Dbarwa	NO	YES	YES	YES
	Dekemhare	NO	YES	YES	YES
	Imnihaili	NO	YES	YES	YES
	Maiaini	NO	YES	YES	YES
	Maimine	NO	YES	YES	YES
	Mendefera	NO	YES	YES	YES
	Segeniti	NO	YES	YES	YES
	Senafe	NO	YES	YES	YES
	Tsorona	NO	YES	YES	YES
	Total Debub	0	12	12	12
DKB	Areta	YES	No	No	YES*
	Makel Denkalia	NO	No	No	YES*
	Debub Denkalia	NO	No	No	YES*
	Asseb	NO	No	No	YES*
Total DKB		1			4
Gash Barka	Agurdet	NO	ND	ND	YES
	Barentu	NO	ND	ND	YES
	Dighe	NO	ND	ND	NO
	Forto	YES	ND	ND	YES
	Gogne	NO	ND	ND	YES
	Haycota	NO	ND	ND	YES
	Logo Anseba	NO	ND	ND	YES
	Mensura	NO	ND	ND	YES

	Mogolo	NO	ND	ND	NO
	Gulug	NO	ND	ND	YES
	Shambuko	NO	ND	ND	YES
	Mulki	NO	ND	ND	YES
	Teseney	NO	ND	ND	YES
	Laalay Gash	NO	ND	ND	YES
Total Gash-Barka		1			12
Maakel					
	Berik	NO	YES	NO	YES*
	Debubawi Mbrak	NO	YES	NO	YES*
	Debubawi-me'rab	NO	NO	NO	YES*
	Gaa-Nefhi	NO	YES	NO	YES*
	Semenawi-me'rab	NO	YES	NO	YES*
	Semenawi-mibrak	NO	NO	NO	YES*
	Serejeka	NO	YES	NO	YES*
Total Maakel		0	5	0	7
SKB	Ghelealo	NO	ND	ND	YES
	Foro	NO	ND	ND	NO
	Dahlak	NO	ND	ND	YES
	Massawa	NO	ND	ND	YES
	Ghindae	NO	ND	ND	YES
	Shieb	NO	ND	ND	YES
	Afabet	NO	ND	ND	YES
	Nakfa	NO	ND	ND	YES
	Adobha	NO	ND	ND	YES
	Karora	NO	ND	ND	YES
Total SKB		0			9
Total Country		2	19	20	33

Legend:

ND (No data): if no information is available

No: Not endemic or below PCT intervention threshold

Yes or known **Prevalence rate** if endemic

* Areas where rapid assessment was used to derive data for Trachoma (only one village was assessed per sub-Zoba).

Annex 1.5: Summary on available data on CM-NTD distribution

Province or region	District or community*	LEISH	Leprosy	Trachiasis	Rabies	Dengue	Brucellosis	Anthrax
Anseba	Elabered	Yes	No	No	Yes	Yes	No	Yes
	Geleb	No	No	No	No	No	No	No
	Keren	Yes	Yes	No	Yes	Yes	Yes	Yes
	Hagaz	No	No	NO	Yes	Yes	No	No
	Halhal	Yes	No	No	Yes	Yes	Yes	No
	Habero	Yes	No	No	Yes	Yes	Yes	Yes
	Asmat	No	No	ND	Yes	Yes	No	No
	Kerkebet	No	No	ND	Yes	Yes	No	No
	Sela	No	No	ND	No	No	No	No
	AdiTekelizan	No	No	No	Yes	No	Yes	No
	Hamelmallo	No	No	No	Yes	Yes	No	Yes
Total Anseba	11	4	1	0	9	8	4	4
Debub	Debarwa	Yes	No	NO	Yes	No	No	Yes
	Areza	Yes	No	NO	Yes	Yes	No	Yes
	Mendefera	Yes	Yes	YES	Yes	No	Yes	Yes
	Dekemhare	Yes	Yes	YES	Yes	Yes	Yes	Yes
	Segeneiti	Yes	No	NO	Yes	Yes	Yes	Yes
	AdiKeyih	Yes	Yes	YES	Yes	Yes	Yes	Yes
	Senafe	Yes	No	YES	Yes	Yes	No	Yes
	Tsorona	No	No	NO	Yes	No	No	Yes
	Adiquala	Yes	No	NO	Yes	Yes	No	Yes
	Emni-Haili	Yes	No	NO	Yes	Yes	No	Yes
	Mai-Aynee	No	No	YES	Yes	Yes	No	Yes

	Mai-Mine	Yes	No	YES	Yes	Yes	Yes	Yes
Total Debub	12	10	3	6	12	9	5	12
DKB	Araata	No	Yes	NO	Yes	Yes	No	No
	Makel Dankalia	No	No	NO	Yes	Yes	No	No
	Debub Dankalia	No	No	NO	No	No	No	No
	Asseb	Yes	Yes	YES	Yes	Yes	Yes	Yes
Total DKB	4	1	2	1	3	3	1	1
Gash Barka	Agurdet	Yes	Yes	NO	Yes	Yes	Yes	Yes
	Barentu	Yes	Yes	YES	Yes	Yes	Yes	Yes
	Dighe	Yes	No	NO	Yes	Yes	No	No
	Forto	No	No	NO	Yes	Yes	Yes	Yes
	Gogne	No	No	NO	Yes	Yes	No	No
	Haycota	Yes	No	NO	Yes	No	No	No
	Logo Anseba	No	No	YES	Yes	Yes	No	No
	Mensura	Yes	No	NO	Yes	Yes	No	Yes
	Mogolo	Yes	Yes	NO	Yes	Yes	No	Yes
	Gulug	Yes	Yes	YES	Yes	No	Yes	Yes
	Shambuko	Yes	No	YES	Yes	No	Yes	Yes
	Mulki	Yes	No	YES	Yes	Yes	No	Yes
	Teseney	Yes	Yes	YES	Yes	Yes	Yes	Yes
	Laalay Gash	Yes	No	NO	Yes	Yes	No	Yes
Total Gash- Barka	14	11	5	6	14	11	6	10
Maakel	Serejeka	Yes	Yes	NO	Yes	Yes	No	Yes
	Berikh	No	No	NO	Yes	Yes	No	No
	Ghalanefhi	Yes	No	YES	Yes	Yes	No	Yes
	North east Asmara	Yes	Yes	NO	Yes	Yes	Yes	Yes

	North west Asmara	Yes	Yes	NO	Yes	Yes	Yes	Yes
	South west Asmara	Yes	Yes	NO	Yes	Yes	Yes	Yes
	South East Asmara	Yes	Yes	NO	Yes	Yes	Yes	Yes
Total Maakel	7	6	5	1	7	7	4	6
SKB	Ghelealo	Yes	Yes	NO	Yes	Yes	Yes	No
	Foro	No	No	NO	Yes	Yes	No	No
	Dahlak	Yes	Yes	ND	Yes	Yes	No	No
	Massawa	Yes	Yes	NO	Yes	Yes	Yes	Yes
	Ghindae	Yes	Yes	NO	Yes	Yes	Yes	Yes
	Shieb	Yes	No	YES	Yes	Yes	No	No
	Afabet	Yes	Yes	YES	Yes	Yes	No	Yes
	Nakfa	Yes	Yes	NO	Yes	Yes	No	Yes
	Adobha	Yes	No	YES	Yes	Yes	No	No
	Karora	Yes	No	NO	Yes	Yes	No	No
Total SKB	10	9	6	3	10	10	3	4
Total Country	58	41	22	17	55	48	23	37

Legend:

ND (No data): if no information is available

No for Not endemic or below elimination threshold

Yes or known **Prevalence rate** if endemic

Annex 1.6: Summary on status of implementation of PCT NTD interventions in sub zobas

Province or region	Sub zoba or community*	LF	SCH	STH	Trachoma
Anseba					
	Hagaz	NO	NO	YES	NO
	Adi-Tekelezan	NO	PCT (1)	PCT (1)	NO
	Asmat	NO	NO	NO	ND
	Elaberd	NO	NO	NO	NO
	Geleb	NO	NO	NO	NO
	Habero	NO	NO	YES	NO
	Halhal	NO	YES	YES	NO
	Hamelmallo	NO	NO	PCT (1)	NO
	Keren	NO	NO	YES	NO
	Kerkebet	NO	NO	YES	ND
	Selea	NO	NO	YES	ND
Total Anseba		0	2	8	
Debub					
	Adequala	NO	PCT (1)	PCT (1)	PCT(3)
	Adikeih	NO	YES	YES	NO
	Areza	NO	YES	YES	PCT(3)
	Dbarwa	NO	YES	YES	PCT(3)
	Dekemhare	NO	YES	YES	NO
	Imnihaili	NO	YES	YES	PCT(3)
	Maiaini	NO	YES	YES	NO
	Maimine	NO	YES	YES	PCT(4)
	Mendefera	NO	YES	YES	PCT(3)
	Segeniti	NO	YES	YES	NO
	Senafe	NO	YES	YES	PCT(3)
	Tsorona	NO	YES	YES	NO
Total Debub		0	12	12	7
DKB	Areta	YES	MAP	MAP	MAP
	Maakle Dankalia	NO	MAP	MAP	MAP
	Debub Dankalia	NO	MAP	MAP	MAP
	Asseb	NO	MAP	MAP	MAP
Total DKB		1			
Gash Barka	Agurdet	NO	MAP	MAP	NO
	Barentu	NO	MAP	MAP	NO
	Dighe	NO	MAP	MAP	NO
	Forto	YES	MAP	MAP	NO
	Gogne	NO	MAP	MAP	NO
	Haycota	NO	MAP	MAP	NO
	LogoAnseba	NO	MAP	MAP	NO

	Mensura	NO	MAP	MAP	NO
	Mogolo	NO	MAP	MAP	NO
	Gulug	NO	MAP	MAP	NO
	Shambuko	NO	MAP	MAP	NO
	Mulki	NO	MAP	MAP	NO
	Teseney	NO	MAP	MAP	NO
	Laalay Gash	NO	MAP	MAP	NO
Total Gash-Barka		1			
Maakel					
	Berik	NO	YES	NO	MAP
	Debubawi Mbrak	NO	YES	NO	MAP
	Debubawi-me'rab	NO	NO	NO	MAP
	Gaa-Nefhi	NO	YES	NO	MAP
	Semenawi-me'rab	NO	YES	NO	MAP
	Semenawi-mibrak	NO	NO	NO	MAP
	Serejeka	NO	YES	NO	MAP
Total Maakel			5	0	
SKB	Ghelealo	NO	MAP	MAP	NO
	Foro	NO	MAP	MAP	NO
	Dahlak	NO	MAP	MAP	NO
	Massawa	NO	MAP	MAP	NO
	Ghindae	NO	MAP	MAP	NO
	Shieb	NO	MAP	MAP	NO
	Afabet	NO	MAP	MAP	NO
	Nakfa	NO	MAP	MAP	PCT(2)
	Adobha	NO	MAP	MAP	NO
	Karora	NO	MAP	MAP	NO
Total SKB		0			1
Total Country		2	19	20	8

Legend: ND (No data): if no information is available

No: if no intervention is required

MAP: if mapping is planned or on-going

PCT (1),PCT (2) ... PCT (10): if MDA. In bracket is the number of round being conducted.
Examples: MDA1 (1) = 1st round of MDA1 (IVM+ALB), T2 (3) = 3rd round of T2 (PZQ in SAC).

Annex 1.7: Summary on status of implementation of CM interventions in sub Zobas

Province or region	District or community*	LEISH	Leprosy	Trachiasis	Rabies	Dengue	Brucellosis	Anthrax
Anseba	Elabered	CM2	No	No	CM2	CM1	No	CM2
	Geleb	No	No	No	No	No	No	No
	Keren	CM2	CM2	No	CM2	CM1	CM2	CM2
	Hagaz	No	No	NO	CM2	CM1	No	No
	Halhal	CM2	No	No	CM2	CM1	CM2	No
	Habero	CM2	No	No	CM2	CM1	CM2	CM2
	Asmat	No	No	ND	CM2	CM1	No	No
	Kerkebet	No	No	ND	CM2	CM1	No	No
	Sela	No	No	ND	No	No	No	No
	AdiTekelizan	No	No	No	CM2	No	CM2	No
	Hamelmallo	No	No	No	CM2	CM1	No	CM2
Total Anseba	11							
Debub	Debarwa	CM2	No	NO	CM2	No	No	CM2
	Areza	CM2	No	NO	CM2	CM1	No	CM2
	Mendefera	CM2	CM2	YES	CM2	No	CM2	CM2
	Dekemhare	CM2	CM2	YES	CM2	CM1	CM2	CM2
	Segeneiti	CM2	No	NO	CM2	CM1	CM2	CM2
	AdiKeyih	CM2	CM2	YES	CM2	CM1	CM2	CM2
	Senafe	CM2	No	YES	CM2	CM1	No	CM2
	Tsorona	No	No	NO	CM2	No	No	CM2
	Adiquala	CM2	No	NO	CM2	CM1	No	CM2
	Emni-Haili	CM2	No	NO	CM2	CM1	No	CM2
	Mai-Aynee	No	No	YES	CM2	CM1	No	CM2
	Mai-Mine	CM2	No	YES	CM2	CM1	CM2	CM2

Total Debub	12							
DKB	Areta	No	CM2	NO	CM2	CM1	No	No
	MakelayKeyihBahri	No	No	NO	CM2	CM1	No	No
	DebubDenkalia	No	No	NO	No	No	No	No
	Asseb	CM2	CM2	YES	CM2	CM1	CM2	CM2
Total DKB	4							
Gash Barka	Agurdet	CM2	CM2	NO	CM2	CM1	CM2	CM2
	Barentu	CM2	CM2	YES	CM2	CM1	CM2	CM2
	Dighe	CM2	No	NO	CM2	CM1	No	No
	Forto	No	No	NO	CM2	CM1	CM2	CM2
	Gogne	No	No	NO	CM2	CM1	No	No
	Haycota	CM2	No	NO	CM2	No	No	No
	Logo Anseba	No	No	YES	CM2	CM1	No	No
	Mensura	CM2	No	NO	CM2	CM1	No	CM2
	Mogolo	CM2	CM2	NO	CM2	CM1	No	CM2
	Gulug	CM2	CM2	YES	CM2	No	CM2	CM2
	Shambuko	CM2	No	YES	CM2	No	CM2	CM2
	Mulki	CM2	No	YES	CM2	CM1	No	CM2
	Teseney	CM2	CM2	YES	CM2	CM1	CM2	CM2
	Laalay Gash	CM2	No	NO	CM2	CM1	No	CM2
Total Gash-Barka	14							
Maakel	Serejeka	CM2	CM2	NO	CM2	CM1	No	CM2
	Berikh	No	No	NO	CM2	CM1	No	No
	Ghalanefhi	CM2	No	YES	CM2	CM1	No	CM2
	North east Asmara	CM2	CM2	NO	CM2	CM1	CM2	CM2

	North west Asmara	CM2	CM2	NO	CM2	CM1	CM2	CM2
	South west Asmara	CM2	CM2	NO	CM2	CM1	CM2	CM2
	South East Asmara	CM2	CM2	NO	CM2	CM1	CM2	CM2
Total Maakel	7							
SKB	Ghelealo	CM2	CM2	NO	CM2	CM1	CM2	No
	Foro	No	No	NO	CM2	CM1	No	No
	Dahlak	CM2	CM2	ND	CM2	CM1	No	No
	Massawa	CM2	CM2	NO	CM2	CM1	CM2	CM2
	Ghindae	CM2	CM2	NO	CM2	CM1	CM2	CM2
	Shieb	CM2	No	YES	CM2	CM1	No	No
	Afabet	CM2	CM2	YES	CM2	CM1	No	CM2
	Nakfa	CM2	CM2	NO	CM2	CM1	No	CM2
	Adobha	CM2	No	YES	CM2	CM1	No	No
	Karora	CM2	No	NO	CM2	CM1	No	No
Total SKB	10							
Total Country	58							

Legend: ND (No data): if no information is available

No: if no active case finding is required (elimination goal is achieved at sub zoba level)

ACF: if active case finding is planned or on-going for assessing the disease burden and treating

CM1: if routine case finding and treatment are on-going in peripheral health facilities

CM2: if routine case finding and treatment are on-going and reference to higher levels (hospitals) is organised for confirmation of diagnosis, treatment and prevention of complications and disabilities

PART 2: OPERATIONAL FRAMEWORK

Annex 2. 1: Package of Preventive Chemotherapy (PCT) - Mass drug administration (MDA)

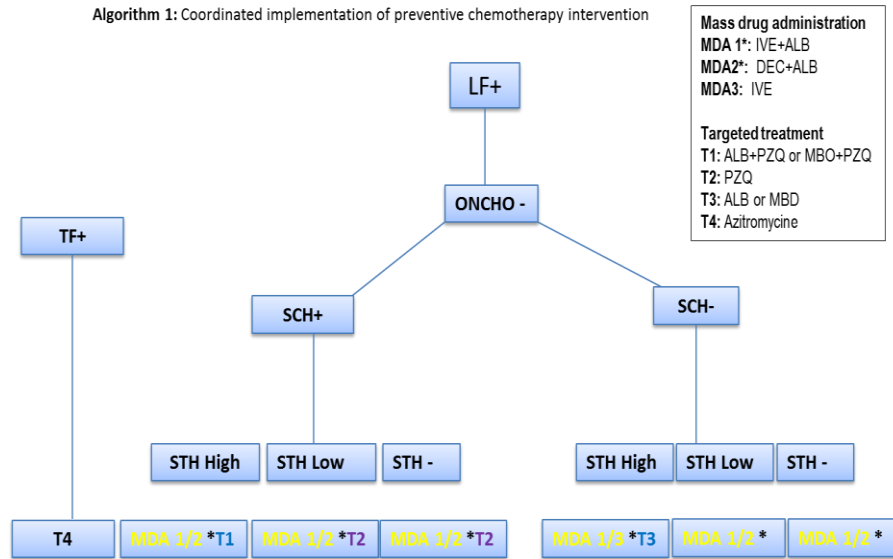
Activity		LF	Schisto	STH	Trachoma
Program coordination		X	X	X	X
Advocacy		X	X	X	X
Resource mobilization		X	X	X	X
Social Mobilization		X	X	X	X
Training		X	X	X	X
Mapping		X	X	X	X
Drug Distribution	School		X	X	
	MDA Campaign	X	X	X	
	Child immunization day		X	X	X
	Health and Nutrition day		X	X	X
HSAM		X	X	X	X
M&E		X	X	X	X

Annex 2.2: Package of Case management (CM) and chronic care

Key interventions	Leprosy	LEISH	LF complications	Trachiasis	Rabies	Dengue	Brucellosis	Anthrax
Advocacy/resource mobilization	X	X	X	X	x	X	X	X
Strengthening partnership	X	X	X	X	x	X	X	X
Inter-sectoral collaboration	X	X	X	X	x	X	X	X
Health promotion	X	X	X	X	x	X	X	X
Capacity building	X	X	X	X	x	X	X	X
Mapping								
Passive case finding	X	X	X	X	x	X	X	X
Active case finding	X	X	X	X		X	X	X
Medical treatment	X	X	X	X	x	X	X	X
Surgery			X	X				
Prevention of disability	X	X	X	X				
Integrated vector management/ reservoir control		X	X	X	X	X		
Surveillance	X	X	X	X	x	X	X	X

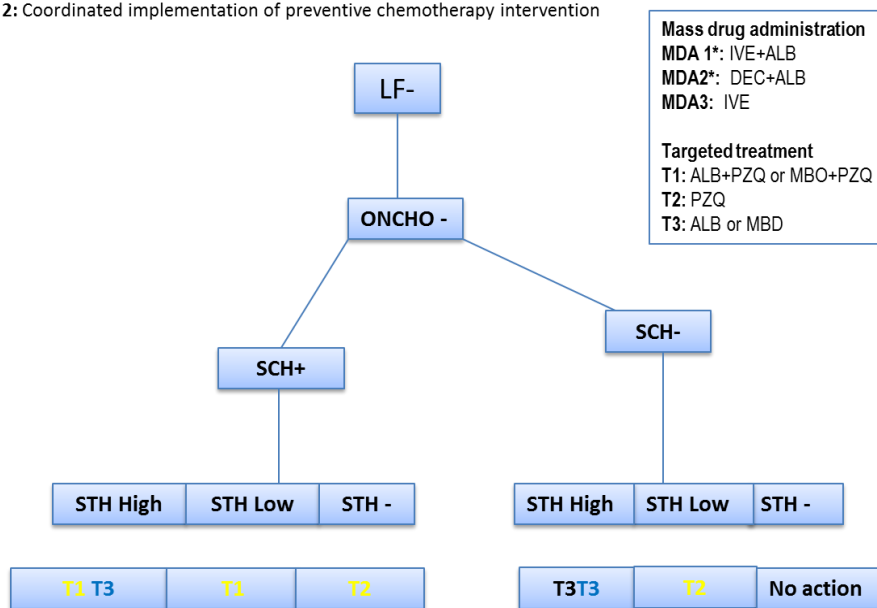
Annex 2.3: PCT algorithm 1

Algorithm 1: Coordinated implementation of preventive chemotherapy intervention

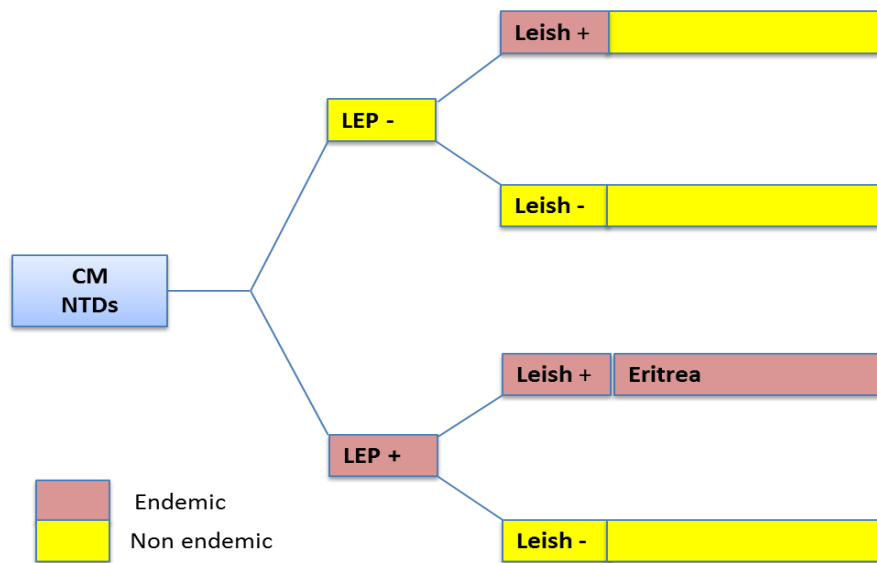


Annex 2.4: PCT algorithm 2

Algorithm 2: Coordinated implementation of preventive chemotherapy intervention



Annex 2.5: Algorithm for Co-endemicity of CM-NTDs (Leprosy and Leishmaniasis) in Eritrea



Annex 2.6 Package of Transmission control - vector/reservoir control

Activity	Vectors and Associated NTDs				
	Mosquitoes			Other Vectors	
				Snails	Sand fly
	LF	Dengue	Malaria	Schisto	Leish
LLINs	X	X	X		
IRS	X	X	X		
Space spraying					
Larviciding	X	X	X	X	X
Prevention/treatment of breeding sites	X	X	X	X	X

Annex 2.7: Package of Improvement of Environment, Supply of safe drinking water, sanitation, and operational research

Activity	LF	SCH	STH	Trach	LEP	Leish	Dengue	Rabies	BRUC
Partnership for water supply improvement		X	X	X					
Partnership for sanitation improvement	X	X	X	X			X		
Social mobilization	X	X	X	X	X	X	X		
Health promotion	X	X	X	X	X	X	X		
Operational research	X	X	X	X	X	X	X		

Annex 2.8: “WHAT to do” by sub zoba (operational unit) by operational package

Province or region	Sub-zoba or community*	PCT-NTDs		CM-NTDs		PCT & CM NTDs			NTDs Targeted for Elimination or Eradication	
		MAP	PCT	ACF	CM1+2	IVM	SWS	IoE	SURV	VERIF
Anseba	Hagaz		X	X	X	X	X	X	X	X
	Adi-Tekelezan		X	X	X	X	X	X	X	X
	Asmat			X	X	X	X	X	X	X
	Elaberd			X	X	X	X	X	X	X
	Geleb			X	X	X	X	X	X	X
	Habero		X	X	X	X	X	X	X	X
	Halhal		X	X	X	X	X	X	X	X
	Hamelmallo		X	X	X	X	X	X	X	X
	Keren		X	X	X	X	X	X	X	X
	Kerkebet		X	X	X	X	X	X	X	X
	Selea		X	X	X	X	X	X	X	X
Total Anseba										
Debub										
	Adequala		X	X	X	X	X	X	X	X
	Adikeih		X	X	X	X	X	X	X	X
	Areza		X	X	X	X	X	X	X	X
	Dbarwa		X	X	X	X	X	X	X	X
	Dekemhare		X	X	X	X	X	X	X	X
	Imnihalli		X	X	X	X	X	X	X	X
	Maiaini		X	X	X	X	X	X	X	X
	Maimine		X	X	X	X	X	X	X	X
	Mendefera		X	X	X	X	X	X	X	X
	Segeniti		X	X	X	X	X	X	X	X
	Senafe		X	X	X	X	X	X	X	X
	Tsorona		X	X	X	X	X	X	X	X
Total Debub									X	X
DKB	Areta	X	X	X	X	X	X	X	X	X
	Maakel Dankalia	X		X	X	X	X	X	X	X
	Debub Dankalia	X		X	X	X	X	X	X	X
	Asseb	X		X	X	X	X	X	X	X
Total DKB						X	X	X	X	X
Gash Barka	Agurdet	X		X	X				X	X
	Barentu	X		X	X	X	X	X	X	X
	Dighe	X		X	X	X	X	X	X	X
	Forto	X	X	X	X	X	X	X	X	X
	Gogne	X		X	X	X	X	X	X	X

	Haycota	X		X	X	X	X	X	X	X
	LogoAnseba	X		X	X	X	X	X	X	X
	Mensura	X		X	X	X	X	X	X	X
	Mogolo	X		X	X	X	X	X	X	X
	Gulug	X		X	X	X	X	X	X	X
	Shambuko	X		X	X	X	X	X	X	X
	Mulki	X		X	X	X	X	X	X	X
	Teseney	X		X	X	X	X	X	X	X
	Laalay Gash	X		X	X	X	X	X	X	X
Total Gash-Barka										
Maakel										
	Berik	X	X	X	X	X	X	X	X	X
	Debubawi Mbrak	X	X	X	X	X	X	X	X	X
	Debubawi-me'rab	X		X	X	X	X	X	X	X
	Gaa-Nefhi	X	X	X	X	X	X	X	X	X
	Semenawi-me'rab	X	X	X	X	X	X	X	X	X
	Semenawi-mibrak	X		X	X	X	X	X	X	X
	Serejeka	X	X	X	X	X	X	X	X	X
Total Maakel										
SKB	Ghelealo	X		X	X					
	Foro	X		X	X	X	X	X	X	X
	Dahlak	X		X	X	X	X	X	X	X
	Massawa	X		X	X	X	X	X	X	X
	Ghindae	X		X	X	X	X	X	X	X
	Shieb	X		X	X	X	X	X	X	X
	Afabet	X		X	X	X	X	X	X	X
	Nakfa	X	X	X	X	X	X	X	X	X
	Adobha	X		X	X	X	X	X	X	X
	Karora	X		X	X	X	X	X	X	X
Total SKB										
Total country										

LEGEND:

MAP= Mapping; PCT= MDA, CDTI and Targeted Treatment; ACF= Active Case finding; CM1+2= Routine case finding and treatment in HF1 (peripheral) and HF2 (reference hospitals); IVM= Integrated Vector Management; SSWS= Sanitation and Safe drinking Water Supply; IoE= Improvement of Environment; SURV= Surveillance; VERIF= Verification

Annex 2.9: Drug estimates and logistics

NTD programme	Drug	Source drug	Status of procurement (donated or purchased)	Minimum lead time before delivery	In-country consignee
LFE	DEC	WHO/GOV	Donated	6 months	Central Medical Store
LEPROSY	MDT blister packs	WHO, Novartis	Donated	6 months	Central Medical Store
SCH	PZQ	WHO/GOV	Donated	6 months	Central Medical Store
STH	ALB	WHO/GOV	Donated	6 months	Central Medical Store
Trachoma	AZI	ITI	Donated	6 months	Central Medical Store

Annex 2.10: Drug forecasting and logistics

Drug	Source of drug	Status of procurement (donate/purchased)	Minimum Lead time before delivery	In-country Consignee
DEC	WHO	Donated	6 months	Central Medical Store
ALB	WHO	Donated	6 months	Central Medical Store
MEB	WHO	Donated	6 months	Central Medical Store
PZQ	WHO	Donated	6 months	Central Medical Store
AZI	ITI	Donated	6 months	Central Medical Store

- Complete the following table to describe how essential NTD drug supplies will be obtained.
- Identify sources of drugs (procured or donated)
- Describe management, logistics and monitoring system for delivering drugs to field distributions sites.

Annex 2.11: Summary of progressive scale up and phase out of PCT interventions package

	Status of interventions	Other PCT-NTD specific activities to be added
1	LF MDA planned in Forto & Araata sub zones	<ul style="list-style-type: none"> • Map schistosomiasis and STH • Collect baseline for LF, schistosomiasis and STH • Coordinate timing of delivery of MDA through community-based and school-based approaches appropriately.
2	LF not endemic	<ul style="list-style-type: none"> • Map schistosomiasis and STH • Coordinate timing of delivery of MDA through community-based and school-based approaches appropriately.

Annex 2.12: Results framework for the WHO-HQ-AFRO-APOC Strategic Plan, 2015–2020

Strategic priorities	Strategic objectives	Core indicators
1 Strengthen advocacy, coordination and partnerships	<p>I. Strengthen coordination mechanisms for the NTD control programme at regional, national and subnational levels in the African Region;</p> <p>II. Strengthen and foster partnerships for the control, elimination and eradication of targeted NTDs at regional, national, district and community levels;</p> <p>III. Enhance high level reviews of NTD programme performance and the use of lessons learnt to enhance advocacy, awareness and effective implementation of targeted interventions;</p> <p>IV. Strengthen advocacy, visibility and profile of NTD control elimination and eradication interventions at all levels in the African Region.</p>	<ul style="list-style-type: none"> • Minutes of high-level NTD coordination meeting; • Minutes of partnership events on NTDs; • Number of high level advocacy events on NTDs; • Number of partners involved in NTD programme.
2 Enhance resource mobilization and planning for results in NTD control	<p>I. Support countries to update integrated multiyear strategic plans and gender-sensitive annual operational plans for the control, elimination and eradication of targeted NTDs</p> <p>II. Enhance resource mobilization approaches and strategies at regional, national and sub-national levels for NTD interventions</p> <p>III. Strengthen the integration and linkages of NTD programme and financial plans into sector-wide and national budgetary and financing mechanisms</p> <p>IV. Support countries to develop and update national NTD policies and elaborate guidelines and tools to guide effective policy and programme implementation</p>	<ul style="list-style-type: none"> • Number of countries with updated national integrated NTD strategic plans; • Number of NTD guidelines and NTD planning and implementation tools developed; • Number of countries with adapted national guidelines and tools; • Presence of NTD budget line; • Total amount of financial resources available for NTD activities; • Percentage of planned NTD funds received.
3 Scaleup access to interventions, treatment and NTD service delivery capacity, within the overall health system	<p>I. Scale up an integrated preventive chemotherapy, including access to interventions for lymphatic filariasis, soil transmitted helminthiasis, onchocerciasis, schistosomiasis and trachoma;</p> <p>II. Scale up integrated case-management-based disease interventions, especially do the following:</p> <p>a. Intensify guinea worm surveillance;</p> <p>b. Enhance HAT control interventions for human African trypanosomiasis;</p> <p>c. Strengthen national programme to control Buruli ulcer;</p> <p>d. Strengthen leishmaniasis control and human</p>	<ul style="list-style-type: none"> • Number of districts mapped for NTDs; • Drug administration coverage; • National coverage; • Parasitological prevalence; • Percentage of disease-specific targets achieved.

Strategic priorities	Strategic objectives	Core indicators
	<p>rabies prevention; e. Strengthen national programme to eliminate tungiasis and control pododermatitis;</p> <p>III. Strengthening integrated vector management for targeted NTDs.</p> <p>IV. Strengthen capacity at the national level for NTD programme management and implementation and accelerate implementation of disease burden assessments and integrated mapping of NTDs;</p>	
<p>4 Enhance NTD monitoring and evaluation, surveillance and operations research</p>	<p>I. Develop and promote an integrated NTD M&E framework and improve monitoring of NTDs, within the context of national health information systems. This will include strengthening the reporting and response to severe adverse events (SAEs) by leveraging on-going efforts to strengthen pharmacovigilance systems;</p> <p>II. Strengthen surveillance of NTDs and strengthen response and control of epidemic-prone NTDs, in particular leishmaniasis;</p> <p>III. Support operational research, documentation and evidence to guide innovative approaches to NTD programme interventions;</p> <p>IV. Establish integrated data management systems and support impact analysis for NTD.</p>	<ul style="list-style-type: none"> • NTD data completeness and timeliness; • Number of evaluation studies conducted and results disseminated; • Number of operational research studies conducted and results disseminated; • A functional data management system.

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