



Republic of Guinea

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Ministry of Health and Public Hygiene

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National Directorate of Public Health

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National Program for the Control of Onchocerciasis and  
Blindness and Neglected Tropical Diseases (PNLOC / MTN)  
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# **A Situation Analysis: Neglected Tropical Diseases in Guinea, 2010**

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This publication was possible by the generous support of the American People with funding from the United States Agency for International Development (USAID) and the Neglected Tropical Disease Control Program, led by RTI International, under Cooperative Agreement No. GHS-A-00-06-00006-00. The author's views expressed in this publication do not necessarily reflect the views of USAID or the United States Government.

## **PREFACE**

La Guinée, à l'instar des autres Pays sub-sahariens, a souscrit aux objectifs du millénaire pour le développement et aux recommandations de la réunion de Ouagadougou (Burkina Faso) en juin 2007 pour la co-implémentation de la lutte contre les maladies tropicales négligées.

Elle met en œuvre depuis 2002 une stratégie nationale de réduction de la pauvreté dont la santé est l'une des composantes essentielles. L'objectif assigné au secteur de la santé dans le cadre de cette stratégie est d' « assurer à tous les hommes et femmes, sans distinction, des soins de santé de qualité.

C'est dans cette optique que s'inscrit la lutte contre les MTN qui constituent un fardeau aux conséquences socio-économiques importantes pérennisant le cercle vicieux de la pauvreté.

Les Maladies Tropicales Négligées les plus fréquentes en Guinée sont : les géo-helminthiases, les schistosomiasés, l'onchocercose, la filariose lymphatique, le trachome, la lèpre, l'ulcère de Buruli et la trypanosomiase humaine africaine. Ces maladies sont présentes au niveau de tous les districts sanitaires du Pays et affectent essentiellement les populations rurales les plus démunies et les plus marginalisées.

Le présent document, intitulé « Analyse de la situation des Maladies Tropicales Négligées en Guinée 2010 », décrit la situation actuelle de cinq maladies négligées dans le Pays : le trachome, la filariose lymphatique, l'onchocercose, les schistosomiasés et les géo-helminthiases. Ce choix se base sur la conjonction de plusieurs facteurs : une superposition des aires d'endémie, une approche thérapeutique similaire qui est la chimiothérapie préventive de masse (CTP), une stratégie de distribution de médicaments optimisée pour accroître la couverture géographique et thérapeutique des interventions.

Le document que j'ai le plaisir de préfacer, est le résultat d'un processus de réflexion et de travail qui remonte au plan stratégique national initial de lutte contre les MTN 2008-2012.

Il est l'affirmation d'un partenariat exemplaire et de notre volonté politique d'identifier et de combattre ces affections qui sont inscrites parmi les priorités du Département de la Santé.

On peut affirmer à juste raison que les informations contenues dans ce document révèlent que des efforts importants ont été faits en matière de cartographie nous permettant d'appréhender la situation épidémiologique des cinq Maladies Tropicales Négligées répondant à la chimiothérapie préventive de masse.

Nous sommes d'ores et déjà convaincus que l'exploitation judicieuse de ce document permettra de faire une planification et une mise en œuvre des activités visant au contrôle ou à l'élimination de ces maladies.

Que l'USAID, RTI et HKI soient vivement remerciés pour leur assistance technique et financière à l'élaboration de ce document.



Le Ministre de la Santé

A handwritten signature in black ink, appearing to read "Naman Keita". The signature is stylized with a large initial "N" and a long horizontal stroke at the end.

**Dr Naman KEITA**

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## ACRONYMS

AIDS	Acquired immune deficiency syndrome
APOC	African Programme for Onchocerciasis Control, World Health Organization
CDTI	Community directed treatment of ivermectin
CO	Corneal opacity
DEC	Diethylcarbamazine
DNS	National Directorate of Statistics
EDSG	Social and Demographic survey of Guinea
EPI	Expanded Programme on Immunization
ES	Epidemiological survey
GF	Guinean franc
HKI	Helen Keller International
IEC	Information, education, and communication
LF	Lymphatic filariasis
MDA	Mass Drug Administration
Mf	Microfilaria
NGO	Non-government organizations
NE	Not evaluated
NTD	Neglected Tropical Disease
ONCP	Onchocerciasis control programme
OMVS	Organization for the Development of the Senegal River
OOAS	West African Organization for Health
OPC	Organization for the prevention of blindness
PASE	Sector Adjustment Programme of Education
PCG	Central Pharmacy of Guinea
PNLOC	Programme for the control of Onchocerciasis and Blindness
PNPCSP	National health management and prevention programme
PZQ	Praziquantel
RAT	Rapid assessment of trachoma
RGPH	General Census of Population and Housing
SAFE	Surgery, antibiotics, facial cleanliness and environmental improvement
SIZ	Special intervention zones
SNSSU	National Health Service and University School
STH	Soil transmitted helminths
TF	Trachomatous inflammation - follicular
TI	Trachomatous inflammation - intense
TS	Trachomatous scarring
TT	Trachomatous trichiasis
USD	US Dollar
WHO	World Health Organization



## ACKNOWLEDGEMENTS

The authors wish to thank several people for their contributions to this report including Dr. Barry M. Oury for his contribution to the trachoma chapter, Dr. Bantignel Oumar Barry for his contribution to the chapter on lymphatic filariasis, Drs. Aïssata Diaby, Balla Camara, Bayo Bafodé and Alpha Barry for their contributions to the chapters on schistosomiasis and soil-transmitted helminthes and Dr. Bernard Philippon for his expertise on onchocerciasis in Guinea.

Documentation was provided by Dr. Antonio Montresor, PCT, WHO Geneva, and Dr. Sylvio Mariotti, PBL, WHO Geneva.

Valuable support was also provided by Dr. Onivogui Goma, Director, National Directorate of Public Health, Ministry of Health and Public Hygiene, Dr. Camara Aïssata, Centre for Study and Research in Environment, Dr. Abdoul Karim Diallo, WHO, Conakry, Dr. Mohamed Sakho, USAID Conakry, Mr Fanfodé, Sightsavers, Guinea and the personnel of HKI Conakry, Dakar and New York who facilitated work in Guinea.

## EXECUTIVE SUMMARY

Neglected tropical diseases (NTDs) affect the poor of developing tropical countries who usually live in rural areas or in slums. They are termed neglected because of the lack of interest shown by international bodies on the one hand, and because of the limited resources allocated to them by the affected countries on the other.

It is estimated that, worldwide, more than one billion people suffer from one or more NTDs, and Guinea is not immune to this multi-faceted scourge. In fact, virtually all the country's population lives in conditions that fuel the perpetuation of these diseases and, indeed, many people are affected by several NTDs. This situation represents an obstacle to socioeconomic development and an additional barrier to overcoming poverty.

This report describes the current situation of a limited number of neglected diseases in Guinea; namely trachoma, lymphatic filariasis, onchocerciasis, schistosomiasis and soil transmitted helminths (STH). The choice is based on a combination of several factors: geographical overlap of endemic areas of several of them; similar preventive and therapeutic approaches, using the same combination of drugs that can treat concomitantly a range of neglected tropical diseases; and an optimized strategy of drug distribution to increase the effectiveness of interventions.

These five diseases, found in virtually the entire country, have different levels of endemicity that constitute a heavy overall burden on Guinea's public health. However, there now exist medications and strategies to combat these diseases through national programs. The control of onchocerciasis has benefited from an international effort that has resulted in highly satisfactory outcomes, with a total absence of new cases of blindness and prevalences of infection well below limits considered acceptable from a public health standpoint. The situation is different for the other diseases: trachoma has an established program that is now integrated with that of onchocerciasis but field interventions remain modest. While the map of the geographical distribution of lymphatic filariasis has been partially established, mass drug administration has not yet begun; the control of STH and schistosomiasis is carried out through the treatment of school-age children and adults at risk, in cooperation with the Ministry of Education through the National Health Service and University School (SNSSU) and the Organisation pour la Mise en Valeur du Fleuve Sénégal<sup>1</sup> (OMVS). Its effectiveness has been limited due to an insufficient and irregular supply of drugs.

Guinea has adopted a strategy of control for these five diseases which is based on integrated intervention and the concomitant administration of a combination of drugs effective against several of these diseases. This strategy is realistic and its implementation is possible provided there is strong political will at the highest

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<sup>1</sup>Organization for the Development of the Senegal River

government level in support of the initiative at all stages of its execution; that those involved in public health activities work in synergy; that development agencies and donors rapidly provide appropriate and continuous support for the time necessary to obtain significant results. So far, the lack of resources, the requirements for other health care activities and the need to improve infrastructure have hampered efforts to implement NTD control programmes in Guinea. The contribution of partners is therefore of prime importance, to enable progress towards achievement of the Millennium Development Goals.

## INTRODUCTION

Neglected Tropical Diseases (NTDs) are a heterogeneous group of 13 diseases with very negative consequences for the health, welfare and socio-economic conditions of communities in many developing countries, particularly low income countries. WHO defines NTDs as diseases affecting almost exclusively poor and powerless people living in rural and deprived urban areas in countries with low income. They are often referred to as “diseases of poverty”

Not only do NTDs constitute a serious public health problem, they are a heavy burden on the community and an obstacle to the implementation of local development projects. The handicap generated by acute or chronic symptoms of NTDs lays the grounds for an even greater impoverishment of people already facing difficult living conditions.

NTDs that are currently affecting more than one billion people around the world include among others, trachoma, lymphatic filariasis (elephantiasis), onchocerciasis (river blindness), schistosomiasis, intestinal helminthiasis, leprosy, Human African trypanosomiasis, leishmaniasis, dracunculiasis, loiasis, Buruli ulcer. The fight against these diseases is now recognized as a factor contributing directly to achieving the Millennium Development Goals.

In Guinea, epidemiological investigations have shown that most of these diseases are widespread throughout the territory and constitute a major public health problem. Almost the entire population is exposed, and many people suffer from several.

To combat these diseases, Guinea has taken a strategic control approach that covers five target diseases (trachoma, lymphatic filariasis, onchocerciasis, schistosomiasis and STH) on the basis of their geographical distribution and the similarity of means of control: Mass Drug Administration (MDA) using the same drugs. This integrated approach helps to maximize the meagre resources available in the country and to present a coherent programme to potential donors.

This document provides an update on the current epidemiological status of these five diseases in Guinea, including the activities undertaken as part of a structured programme or as ad hoc interventions, recommended strategies and options for control, possible outcomes and partners, and challenges for programme development and implementation.

The preparation of this document was made possible through the participation of many colleagues from the Ministry of Health and Sanitation and other agencies, international organizations and non governmental actors involved in the day-to-day fight against neglected diseases in Guinea. To this end, a meeting was held under the auspices of the National Director of Public Health to designate one or more contact persons for each disease. The information gathered in Guinea was provided on the basis of studies and pre-existing reports. Additional information was collected orally to clarify, or complement, the available documentation.

## **COUNTRY PROFILE**

### ***Geographical context***

The Republic of Guinea is a coastal country situated in Western Africa. It shares its borders with six countries: Côte d'Ivoire, Guinea-Bissau, Liberia, Mali, Senegal and Sierra Leone. It has a 300 km opening on the Atlantic Ocean to the west.

The country is divided into four natural, ecologically distinct, regions: Lower Guinea or maritime region (20% of the area), a maritime region characterized by high rainfall; Middle Guinea (18%) a region of mountains and plateaus, considered to be the water tower of West Africa because many West African rivers have their sources there; Upper Guinea (22%) where a Sahelian climate makes it the driest region of Guinea; and Forest Guinea (40%), with a subtropical humid climate, which receives regular rainfall throughout most of the year.

### ***Demographics***

Based on the data of the Recensement Général de la Population et de l'Habitat<sup>2</sup> (RGPH) in 2005, the country's population is projected to reach 10,915,000 inhabitants in 2010, 48% male and 52% female. The Guinean population is young: those aged 0-14 years account for 48.4% of the total population. Nearly 70% of the population lives in rural areas. Conakry - the capital city - has about 2 million inhabitants.

The natural population growth rate is 3.1%. Projections indicate that if growth continues at this rate, Guinea will have approximately 14 million inhabitants in 2018.

The Guinean population is affected by intense internal migration from the Middle and Upper Guinea regions towards the Maritime region (including Conakry) and the Forest region. International migration remains low despite the country's opening to the outside world since 1984. For the past 10 or more years, Guinea has recorded more than half a million refugees from Liberia, Sierra Leone, Guinea Bissau and Côte d'Ivoire, following the civil wars that erupted in these bordering countries.

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<sup>2</sup> General Census of Population and Housing

**Table 1: The Main Socio-demographic Indicators**

<b>Human Development:</b>	
Life expectancy	54 years
GDP Growth Rate	2.2%
Inflation rate (year)	39.1%
<b>Demography and Health</b>	
Annual growth rate of population	3.1%
Birth rate (‰)	36.9
Maternal mortality for 100,000 live births	980
Infant mortality rate (‰)	91
Child mortality rate (‰)	163
percentage of national budget for health	5.6%
<b>Education</b>	
Net enrollment	63%
Literacy rate among adult women	14%
Literacy rate among adult men	45.7%
Percentage of national budget for education	14.7%
<b>Poverty Index</b>	
Incidence of poverty at national level	53.6%

[Sources: DSRP2 (2007-2010); EDSG III (2005)]

### ***Political and administrative organization of the country***

Guinea is a secular state, independent since 2 October 1958, with a president and a parliament.

Administratively, Guinea is divided into seven regions plus the city of Conakry, which has a status of decentralized authority. The country has 33 préfectures, 302 sous- (sub-) préfectures and 1615 rural districts. Conakry, the capital, is divided in 5 communes.

**Figure 1: Administrative Map of Guinea**



### ***Socio-economic context***

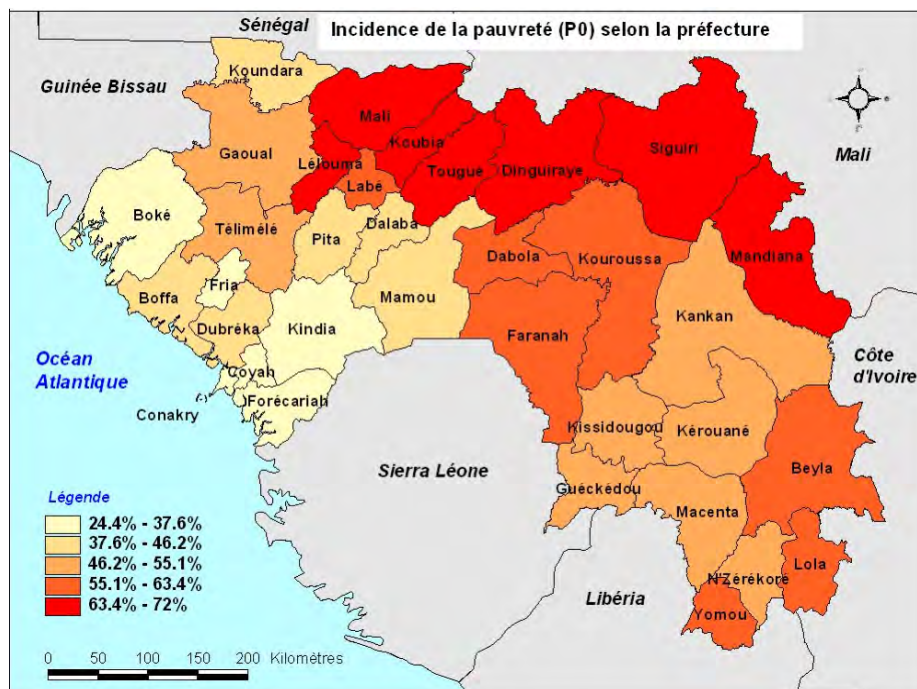
The Republic of Guinea has considerable economic potential from the agriculture sector, including small individual farms (cereals, starchy roots, pulses etc...), which employs 80% of the population, the fishing sector, mineral resources and hydropower. Guinea owns two thirds of global reserves of bauxite, large deposits of high grade iron, gold and diamonds. The mining sector contributes to financing the development of the country, generates 60% of tax revenue and represents 80% of exports. The economic policy of Guinea is based on liberalism which was adopted in 1985 and the national currency is the Guinean franc (GNF = Guinée Nouveau Franc).

According to the results of the DSRP, the poverty level of the Guinean population remains a concern. Nearly half of the population (49.2%) live below the poverty line, that is to say FG 387,692 (196 USD) per person per year. Among these poor people, 19.1% live in extreme poverty, with an income below 228,900 FG (116 USD) per person per year.

Since 2003, poverty has significantly worsened. Estimates by the World Bank and the Ministry of Planning through the Direction Nationale de la Statistique<sup>3</sup>(DNS) indicate that the incidence of poverty reached 50% in 2003, 50.1% in 2004 and 53.6% in 2005. The deterioration in the living standards of Guineans is a consequence of the severe degradation of the national economic situation since 2003.

<sup>3</sup> National Directorate of Statistics

**Figure 2: Poverty Incidence by Préfecture**



Source: DSRP2 (2007-2010)

Figure 2 shows the varying incidence of poverty in the préfctures. The préfctures which recorded an increased level of poverty are those that form the backbone of North and North-eastern Guinea, with poverty rates ranging between 67% and 72%.

### ***Education***

The literacy rate of the population varies between 40% and 50% depending on region. It is characterized by an imbalance between men and women, with respective proportions of 41% for men and 22% for women. This has a negative impact on the adoption of certain behaviours beneficial to health and on the dissemination of written information, education, and communication (IEC) messages.

### ***Water Supply and Sanitation***

The habitat conditions are generally characterized by precarious living in shelters that do not meet basic standards of hygiene. On average, there are 3 people per 10 square meters of living space. In urban areas, 60% of households live in shared homes. According to Enquête Démographique et Sociale de Guinée<sup>4</sup> (EDSG) 2005, 59.2% of the population has access to safe drinking water (tap water, drilling wells or protected), 84.9% in urban and 48.4% in rural areas. According to the same source, 70.1% of the population has access to sanitation (flush, pit / latrine): 94.3% in urban and 59.9% in rural areas.

<sup>4</sup> Social and Demographic survey of Guinea

# ORGANIZATION OF THE HEALTH SYSTEM

The Health system has a 3-level pyramidal organization as shown in Table 2, below.

**Table 2: General Structure of the Ministry of Health**

Level	Administrative Structures	Care Facilities	Coordination Bodies	Guidance Bodies
National (Central)	National Directorates: <ul style="list-style-type: none"> <li>• Support Services</li> <li>• Related services</li> <li>• Public Hospitals</li> </ul>	National Hospitals	Technical Coordination Committee	National Board of Health National Commissions Boards of Directors of National Hospitals
Regional (Intermediate)	Regional Directorates of Health	Regional Hospital	Regional Technical Committee of health	Regional Health Committee Board of Directors of the Regional Hospital
Prefectural (peripheral)	Prefectural Health Department (DPS)	<ul style="list-style-type: none"> <li>• Centre Médico-Communaux.</li> <li>• Prefectural Hospitals.</li> <li>• Health Centres</li> <li>• Health posts</li> </ul>	Prefectural Technical Committee of Health	Boards of Directors of Prefectural Hospitals & Management committees of health centres.

Source: Statistical Yearbook 2006.

The healthcare system in Guinea is composed of public and private sectors. The public sector has a pyramidal organization and includes from base to top: the health post, health centre, communal medical centre, prefecture hospital, regional hospital and two national hospitals (both in the capital city). The private sector comprises medical care structures: consultations and care, surgery, polyclinics, dental clinics, midwifery clinics; pharmacies, retail outlets, promotional agencies and wholesalers.

## Resources of the health sector

This section presents information on the resources of the health sector and focuses on infrastructure and human resources (Statistical Yearbook 2006).



### ***Health infrastructure***

The physical condition and functional status of this infrastructure varies according to age and level of maintenance. In fact, many facilities are not functional because of their physical condition and renovation and extension of the hospitals is required to meet minimum standards. Table 3 shows, by type, the number of public and private structures.

**Table 3: Private and Public Health Facilities**

<b>Type</b>	<b>Number</b>
Health posts	628
Health Centres	390
Prefectural hospitals	26
Communal medical centres	9
Regional hospitals	7
National hospitals	2
Consultation and care facilities	216
medical and surgical centres	28
Polyclinics	8
Dental clinics	13
Midwifery clinics	17

Source: 2006 Yearbook of health statistics.

The pharmaceutical and biomedical sector has 284 private pharmacies of which 78.5% are in Conakry, with 39 outlets located mainly in rural areas, 16 promotional agencies (all in the capital), 25 wholesalers and distributors of medicines, of which only one is upcountry, and five biomedical laboratories all in Conakry.

### ***Human Resources***

The Department of Public Health employs approximately 6,717 people divided between caregivers (80%) and support staff (20%). The table below shows the distribution of health personnel in health facilities.

**Table 4: Distribution of Staff by Types of Health Facilities**

Health care facilities	Personnel	
	Number	Proportion
<b>Hospitals</b>	2295	48,9
National	841	17,9
Regional	467	10,0
Prefectural	987	21,0
<b>Health centres</b>	2396	51,1
Urban Health centres	1107	23,6
Rural health centres	1044	22,3
Health post	245	5,2
<b>Total</b>	<b>4691</b>	<b>100,0</b>

Table 4 shows that 49% of the personnel work in hospitals. It is also clear from this table that 72.5% work in urban areas (hospitals and urban health centres), home to only 30% of the population.

## Pharmaceuticals

The supply of pharmaceuticals is ensured at national level by two official sources: the Pharmacie Centrale de Guinée<sup>5</sup> (PCG) and private wholesalers. The availability and accessibility of pharmaceutical products is not satisfactory. Consequently, this has resulted in the rapid and uncontrolled development of an illegal parallel market, providing drugs usually of poor quality including, possibly, counterfeits, and thus constituting a threat to the health of the population.

### *The public sector*

The main representative of this sector is the PCG, which “fulfils an industrial and commercial mission of public interest and public service. It supplies quality health products to health facilities, NGOs involved in public service projects, bilateral and multilateral cooperation projects, universities, institutions and other pharmaceutical establishments authorized by the Ministry of Public Health”<sup>6</sup>.

The Central Pharmacy of Guinea has the status of an Industrial and Commercial Public Institution; it owns five stores in the regions.

<sup>5</sup> Central Pharmacy of Guinea

<sup>6</sup> Politique pharmaceutique nationale, Ministère de la santé publique, février 2006

In addition there are vertical health programmes using other procurement methods and other distribution networks. This is the case for vaccines administered by the Expanded Programme on Immunization (EPI), the anti-retroviral treatment programme administered by the Programme National de Prise en Charge Sanitaire et de Prevention<sup>7</sup> (PNPCSP), the anti-malaria drugs administered by the Malaria National Programme, anti-tuberculosis drugs administered by the National Programme for TB control, and anti-leprosy drugs administered by the National Programme for leprosy control.

A second structure, the EPI/Primary Health Care/Essential Drugs group, manages medicaments from the public sector. It has its own distribution network in the regions and supplies health centers.

### ***The private sector***

A significant part of the pharmaceutical activities is run by this sector. It comprises 19 wholesalers - distributors, and 273 pharmacies of which 213 are located in the capital. There are 17 registered promotional agencies (Source DNPL).

In addition to these two sectors, there are other groups involved in pharmaceutical activities:

- NGOs;
- Religious entities (6 centres in Conakry);
- International and bilateral aid;
- Mining companies

### ***Traditional medicine***

The traditional medicine healers and pharmacopea are used by more than 50% of the population. Their appropriate integration into the health system would enable better management of patients as well as Research and Development in this area.

## **Financial resources and financing of the health sector**

Funding for the health sector comes from four main sources: state, local government, citizens and donors.

The state funds the salaries of the main staff of the public health services, the purchase of some vaccines, other operating expenses of central and decentralized structures, some initial training and retraining. It contributes to investment in health centres and hospitals. The share of the Department of Health in the state budget remains around 5% (far short of the 10% recommended by WHO)

Local authorities (municipalities, préfectures, and regions) have a relatively low share of funding that is used for the salaries of some staff.

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<sup>7</sup> National health management and prevention programme

Citizens support part of the health infrastructure and, through a cost recovery system, part of the operating costs of care facilities including the purchase of pharmaceuticals, maintenance costs, and management. In addition, there is the important, but not precisely assessed, contribution of households to private care, laboratory examinations and purchase of medicines.

Donors (institutions, NGOs, etc.) finance mainly infrastructure and equipment, initial training and retraining, logistics and the purchase of some medicines and consumables.

### **Organization of School Health**

The Service National de Santé Scolaire et Universitaire<sup>8</sup> (SNSSU) is a structure of the Ministry of Education. The Programme d'Ajustement Sectoriel de l'Education<sup>9</sup> (PASE) was established in 1995 within the SNSSU in order to improve the learning capabilities of school-age children through improved health and nutrition.

## **THE NEGLECTED TROPICAL DISEASES**

### **TRACHOMA**

**Pathogen** -- Trachoma is an eye infection caused by *Chlamydia trachomatis*.

Transmission takes place through eye secretions from an infected person via the fingers or a dirty handkerchief, or from fly vectors. The disease mostly affects the poorest populations living in typical conditions of poverty, where sanitation is poor and access to water limited.

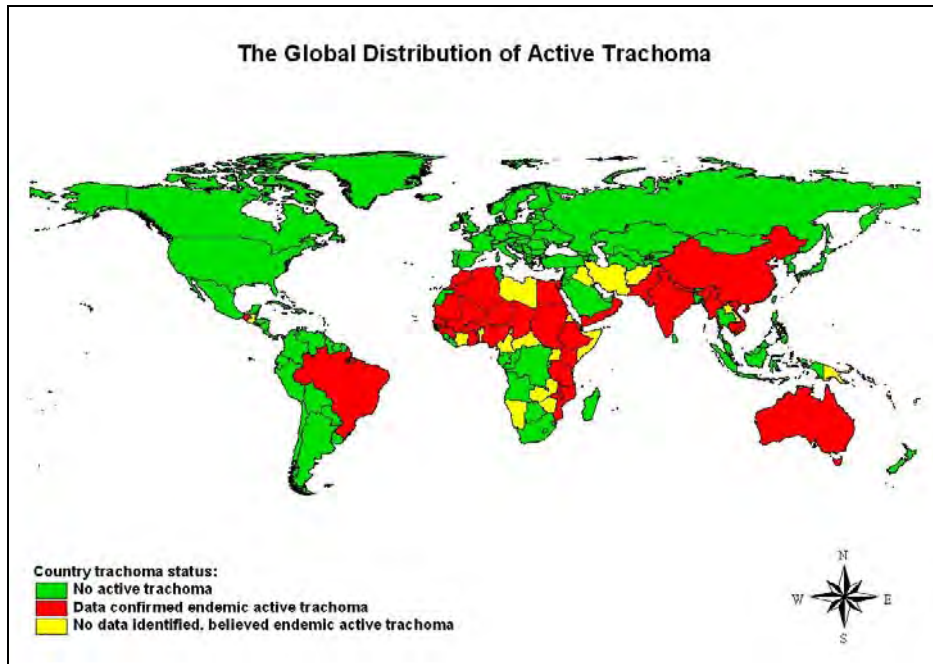
**Geographic Distribution** -- Trachoma is still endemic in 56 countries and affects mainly the poorest and most isolated rural areas in Africa, Asia, Central and South America, Australia and the Middle East

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<sup>8</sup> National School and University Health Service

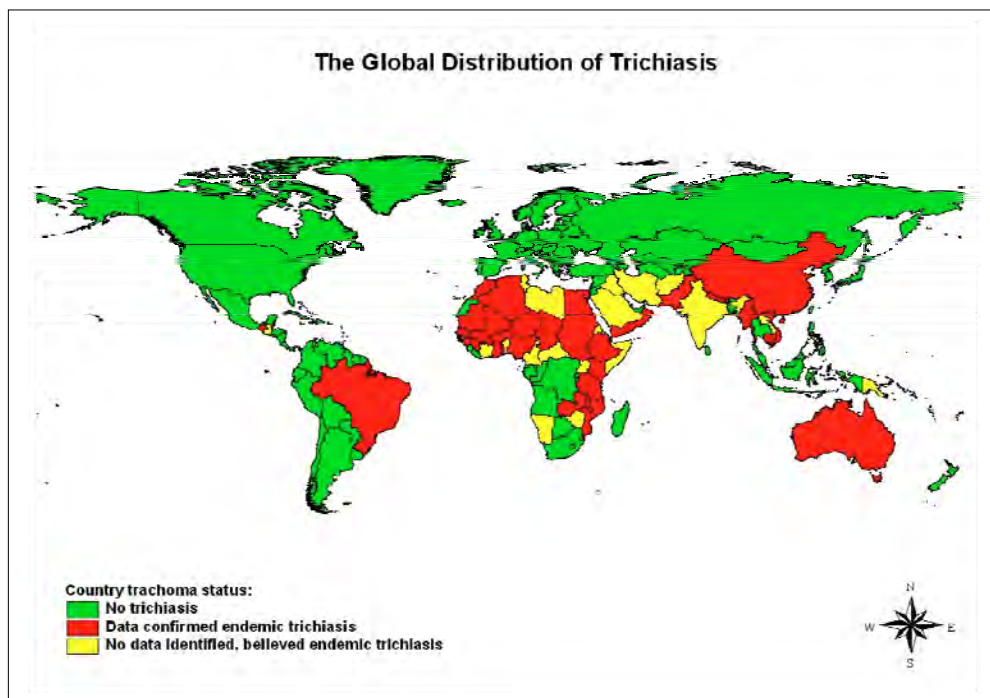
<sup>9</sup> Sector Adjustment Programme of Education

**Figure 3: Global Distribution of Active Trachoma**



(Source: WHO)

**Figure 4: Global Distribution of Trachomatous Trichiasis**



(Source: WHO)

**Burden of the disease** -- Trachoma affects about 84 million people worldwide, of which approximately 8 million have visual impairment or are blind. It currently accounts for more than 3% of cases of infectious blindness in the world. But the prevalence of trachoma tends to decrease with socio-economic improvements and thanks to control programmes.

**Clinical presentation** -- From a clinical perspective, WHO has developed a simple and efficient way to recognize trachoma at different stages of evolution, namely:

1. Trachomatous inflammation - follicular (TF): presence of 5 or more follicles of at least 5mm in the upper tarsal conjunctiva.
2. Trachomatous inflammation - intense (TI): pronounced inflammatory thickening of the tarsal conjunctiva that obscures more than half of the normal deep tarsal vessels.

These two stages represent active trachoma, which is highly contagious and occurs mainly in children.

3. Trachomatous scarring (TS): presence of scarring in the tarsal conjunctiva.
4. Trachomatous trichiasis (TT): at least one eyelash rubs on the eyeball, or there is evidence of recent removal of in-turned eyelashes.
5. Corneal opacity (CO): easily visible corneal opacity over the pupil.

The two stages, TT and CO are considered Blinding Trachoma.

**Diagnosis** -- The diagnosis is made by clinical examination of both eyes. The 3 first stages, TF, TI and TS can be identified simply by turning up the upper lid and examining the conjunctiva. The 2 last stages are clearly visible without examining the conjunctiva.

**Treatment** -- Antibiotics (azithromycin, tetracycline) for the treatment of active disease (TF, TI) and surgery (which reverses the in-turning of eyelashes) for trichiasis.

In affected communities, treatment must be accompanied by hygiene measures and environmental improvements.

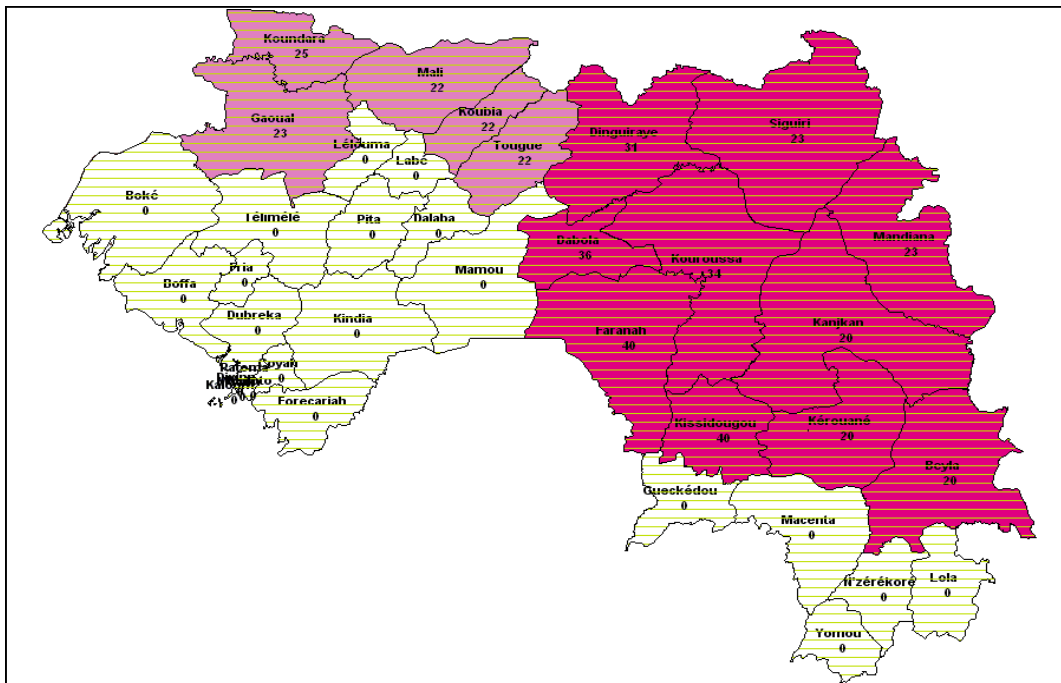
### ***Epidemiology and trachoma control in Guinea***

In Guinea, areas with high prevalence of trachoma are mostly in the Upper Guinea region and the northern part of Middle Guinea, which are among the poorest areas of the country.

A survey conducted for this purpose in 10 districts of Upper Guinea in 2001 showed an average prevalence of 33% of active trachoma in children under the age of 10 and 2.7% of trachomatous trichiasis among women over 15 years. In 2010, the population of these 10 districts is estimated to be 2,818,109 inhabitants.

In 2002, the trachoma rapid assessment in the five health districts of the northern edge of Middle Guinea revealed an average rate of 23% of active trachoma, and 1.09% of trachomatous trichiasis. In 2010, the total population of this endemic area is estimated to be 927,191 inhabitants.

**Figure 5: Districts Evaluated by Survey or Rapid Assessment**



These results confirm that the prevalences in surveyed communities are at much higher levels than the threshold above which WHO considers the disease to be a serious public health problem (more than 10% for active trachoma and more than 1% for trichomatous trichiasis).

Based on these surveys, it is estimated that more than 3 million people require mass chemotherapy and more than 25,000 cases of trichomatous trichiasis are in need of surgery to prevent blindness.

There are no data concerning the regions of Lower and Forest Guinea and it will be necessary to conduct evaluations to complete the epidemiological picture of trachoma throughout the country. The table in Annex 1 summarizes the results of surveys on trachoma in Guinea.

### ***Strategy and interventions for trachoma control in Guinea.***

The elimination of trachoma will follow the SAFE strategy proposed by WHO, which includes the following components:

- Surgery on people with trichiasis at immediate risk of blindness;
- Antibiotic therapy to reduce the community reservoir of infection and stop transmission (Azithromycin, Tetracycline);
- Facial cleanliness and improved hygiene to reduce transmission;
- Environmental improvement, particularly water and sanitation.

Since 2004, some interventions limited in time and space have been carried out: implementation of the SAFE strategy in six villages in the health district of Kankan in collaboration with HKI, and the regional hospital of Kankan and funded by Pfizer took part by conducting surgery for trichiasis;

In collaboration with THEA, HKI and OPC: screening of 848 cases of trachomatous trichiasis in four prefectures in the health district of Kankan with a prevalence exceeding 20%. This was followed by mass treatment with azithromycin for all preschool children and surgery of cases of TT.

In collaboration with OPC and funding from Sight First: 1556 cases of trachomatous trichiasis were detected in 2004 by community distributors of ivermectin of which 510 were operated. In 2005, 2006 and 2007, 1,900 out of 3,000 cases of trachomatous trichiasis were operated.

Currently, there are few surgical interventions on cases of trachomatous trichiasis - less than 500 operations per year. This is far short of needs in the light of the estimated over 39,000 cases awaiting surgery. Despite the high prevalence of active trachoma (over 20%) among children under 10 years, no mass drug distribution is currently being implemented due to lack of resources.

Given this context of hyperendemicity in affected countries such as Guinea, trachoma control was identified as a priority for WHO. As a result, the "Alliance for the Global Elimination of blinding Trachoma" was established. Guinea has been a member of the Alliance since 1999 and regularly attends its meetings.

In 2003 the control of onchocerciasis and other causes of blindness, including trachoma, were merged in a single Programme National de lutte contre l'onchocercose et la cécité<sup>10</sup>, (PNLOC).

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<sup>10</sup> Programme for the control of Onchocerciasis and Blindness



### ***Governmental, International and Non-governmental organizations involved in trachoma control in Guinea***

- Ministry of Health and Public Hygiene through the PNLOC
- World Health Organization (WHO)
- Organisation Ouest Africaine de la santé<sup>11</sup> (OOAS)
- Helen Keller International (HKI)
- Organisation pour la Prévention de la Cécité (OPC)
- PLAN Guinée
- SightSavers

### ***Challenges***

- Staff training for management and MDA: distribution of the drug is an essential component for community-wide prevention of blinding trachoma. This training will be needed at all levels of the health pyramid and its community outreach. It should deal with the supply, inventory management, transport and distribution of the drug at the community level.
- Training of nurses in surgery of trichomatous trichiasis: this will need to involve specific training for nurses who are stationed in areas endemic for trachoma. The current trachoma plan (2011-2015) estimates the need for 47 additional TT operators to be trained (only 5 are currently practicing)
- Completion of trachoma mapping throughout the country: to date, as has been stated above, there are still health districts that have not been evaluated for the prevalence of trachoma. It is therefore important to carry out investigations in these areas in order to complete the picture of the geographical distribution and levels of prevalence of trachoma in Guinea and evaluate the quantity of drugs needed.
- Mass Drug administration to the population living in endemic zones with geographic and therapeutic coverages of 100% and above 80%, respectively.
- Monitoring and evaluation of field activities: this will require training on several levels:
  - recording of MDA data at the community level;
  - transmission of data to higher levels for aggregation at programme headquarters.
  - data analysis and feedback.
- Evaluation of the effectiveness of the programme should be undertaken after 3 or 5 years of implementation, as recommended by recent WHO guidelines.

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<sup>11</sup> **West African Organization for Health**

- Improvement of personal hygiene and environmental sanitation and provision of latrines to the communities.
- Information, education and communication must accompany any programme incorporating mass drug administration: MDA implies that all the community should be treated, therefore, IEC is important as the portion of the population which does not suffer from any sickness, may otherwise not understand the need to take medication.

## **LYPHMATIC FILARIASIS**

**Pathogen** -- Lymphatic filariasis (LF) is a parasitic disease caused by *Wuchereria bancrofti*, *Brugia malayi* or *Brugia timori*. These parasites are transmitted to humans through the bite of an infected mosquito and then develop into adult worms. The threadlike parasitic worms live almost exclusively in humans. These worms lodge in the lymphatic system, the network of nodes and vessels that maintain the delicate fluid balance between tissues and blood, and are an essential part of the immune system of the body. They have a lifespan of 4-6 years, producing millions of immature microfilariae that circulate in the blood.

**Geographic Distribution** -- Lymphatic filariasis, or elephantiasis, threatens more than one billion people in about 80 countries. A third of those infected live in India, one third in Africa and the rest mainly in South Asia, the Pacific and the Americas.

**Burden of the disease** -- Lymphatic filariasis affects people in rural areas and people in poor, peri-urban and urban zones. Over 120 million people are already affected, and over 40 million are seriously incapacitated and disfigured by the disease. In recent years, lymphatic filariasis has steadily increased because of the expansion of slums and poverty, especially in Africa and the Indian subcontinent. Many filariasis patients are physically incapacitated, and this prevents them from working normally. Lymphatic filariasis is particularly severe because the chronic complications are often considered shameful and are therefore hidden. For men, genital damage is a severe handicap leading to physical limitations and social stigmatization. For women, the disease is also associated with feelings of shame and taboos. Those with lymphoedema are considered undesirable; those with hypertrophy of the lower limbs and genitals are rejected by society; marriage, an essential source of security in many situations, is often impossible.

**Clinical presentation** -- Although the infection is usually acquired in childhood, the disease occurs only after several years. About half of the people affected have no clinical manifestations. However, even in the absence of clinical symptoms, studies have now shown that such people, apparently healthy, actually have hidden lymphatic pathology and most likely, kidney damage. The asymptomatic form of infection is most often characterized by the presence in the blood of thousands, or millions, of microfilariae and adult worms located in the lymphatic system.

The most severe symptoms of the chronic disease generally appear in adults and are more common in men than women. In communities where the disease is endemic, 10-50% of men suffer from genital damage, particularly hydrocele, elephantiasis of the penis and scrotum. Elephantiasis of the entire leg, the entire arm, vulva or breasts - whose size can reach several times the norm - can affect up to 10% of the population in these communities.

The acute manifestations of lymphatic filariasis are:

- acute inflammatory episodes of the limbs or scrotum that are related to bacterial or fungal super infection of tissues with already-compromised lymphatic function;
- inflammation of the lymph node with 'retrograde' extension down the lymphatic tract and an accompanying 'cold' oedema;
- tropical pulmonary eosinophilia, caused by an immunologic hyper-responsiveness to filarial infection;
- acute inflammatory reaction caused by filarial infection which appears early after infection.

Chronic lymphoedema, or elephantiasis, are often accompanied by localized acute inflammation of the skin, lymph nodes and lymph vessels, sometimes due to the body's immune response to the parasite, but mostly due to the bacterial or fungal super infection of the skin where normal immune defenses are compromised under the effect of underlying lymphatic damage. Cleanliness of local infections can greatly assist in the healing and slow or, even more remarkably, reverse much of the damage already present.

Chyluria, the discharge of lymph in the urine is generally intermittent.

All these aspects of the disease have serious psychological and social implications.

**Diagnosis** -- Classically, diagnosis of lymphatic filariasis was done through microscopic examination of night blood samples for evidence of blood microfilariae. The nocturnal periodicity of microfilaraemia (*W. bancrofti* only) therefore required collection of blood around midnight, making the procedure even more cumbersome.

The detection of circulating antigens of parasites with a simple, sensitive and specific antigen-detection test has completely revolutionized the diagnosis of LF. It can be done at any time of day and the result can be obtained in less than an hour.

**Treatment** -- Classically, lymphatic filariasis has been treated with diethylcarbamazine (DEC). More recently, single doses of two drugs in combination, either albendazole + DEC or ivermectin + albendazole proved to be very effective in removing 99% of the microfilariae from the blood for a period of one year following treatment.

Hygienic measures can reduce the frequency of acute attacks and can stop the disease from getting worse or even reverse lesions. Most cases of hydrocele require surgery.

### ***Epidemiology of LF in Guinea.***

Because of its severely disabling clinical expression, lymphatic filariasis was long known to the Guinean health services. For decades, cases were reported from 10 health districts (Boke, Forecariah, Kindia, Koubia, Beyla, Faranah, Kankan, Kerouane, Kouroussa and Siguiri). However, the extent of the geographical distribution of LF and its prevalence throughout the country had not been investigated.

In 2005, an evaluation was conducted in 46 villages scattered in 24 health districts across the 8 administrative regions for which there was no data on the disease (table 5). Fifteen districts were found to be endemic and the level of prevalence was determined.

Currently, LF is found in 25 out of 38 health districts.

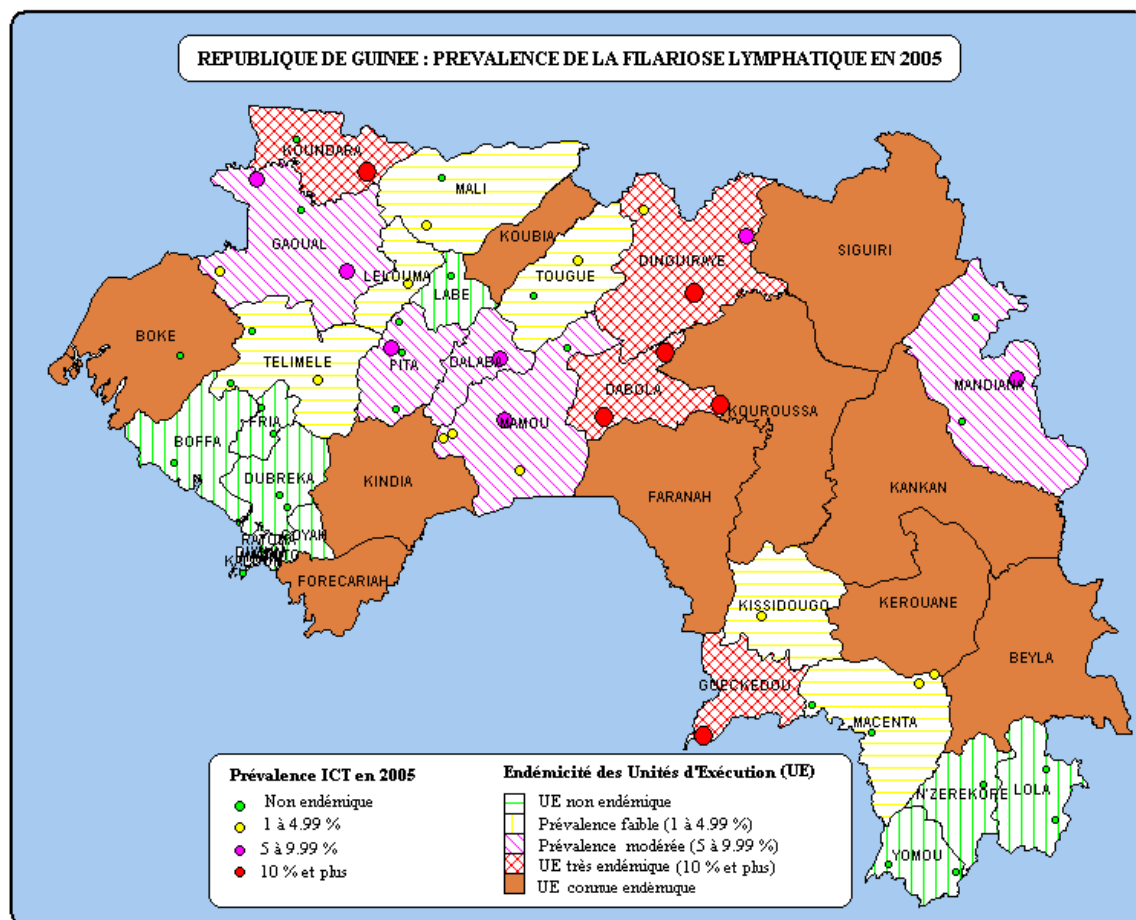
**Table 5: Results of the Evaluation of Lymphatic Filariasis by Region**

Regions	Males		Females		Validated Tests	Prevalence (ICT) %
	Examined	Positive	Examined	Positive		
Conakry	50	0	50	0	100	0
Kindia	231	0	279	1	497	0.2
Labé	290	6	310	1	584	1.2
N'zérékoré	416	5	484	9	900	1.6
Kankan	150	2	150	3	300	1.7
Boké	314	10	383	12	680	3.2
Mamou	343	18	355	4	698	3.2
Faranah	320	43	378	20	698	9
Total	2114	84	2389	50	4457	3

It is estimated that over 8 million people are exposed to the parasite that causes the disease.

Figure 6 shows the distribution and level of prevalence of filariasis in Guinea on the basis of the above-mentioned study and the districts from where the disease was previously reported by the health services.

**Figure 6: Geographical Distribution and Prevalence of LF in Guinea**



### ***Control of lymphatic filariasis in Guinea***

There is currently no public health intervention to control lymphatic filariasis in Guinea. However, it is planned to link such interventions with the onchocerciasis control programme.

### ***Strategy for the control of lymphatic filariasis in Guinea***

The strategy adopted by Guinea is the one recommended by the Global Programme for the Elimination of Lymphatic Filariasis. It has two components: first, to stop the spread of infection (interrupt transmission) and, second, to alleviate the suffering of affected individuals (control morbidity).

To interrupt transmission, districts where lymphatic filariasis is endemic must be identified and Mass Drug Administration (MDA) campaigns carried out to treat all exposed populations. The programme will be based on the administration at least once a year of single doses of two oral drugs given together - albendazole plus ivermectin - to the exposed population aged 5 years and above. These annual MDA campaigns should be carried out over a period of 4 to 6 years. In Guinea, as already stated, it is planned to

integrate the control of filariasis in an overall strategy to control five diseases requiring a similar approach: trachoma, lymphatic filariasis, onchocerciasis, schistosomiasis and intestinal helminthiasis.

To alleviate suffering due to illness, community health education programmes will raise awareness in affected patients and promote intensive skin care and hygiene which can prevent acute episodes of inflammation, limit the progression of the disease and improve, or even reverse, already existing lesions.

### ***Governmental, International and Non-governmental organizations involved in the fight against lymphatic filariasis in Guinea***

To date, only the World Health Organization has taken part in LF activities by supporting the epidemiological mapping of filariasis in the country.

### ***Challenges***

The fight against lymphatic filariasis has not yet started. The initiation of an effective programme in the case of an integrated approach will require:

- developing an action plan covering at least five years;
- training of personnel for screening, mass drug administration and management of patients with debilitating disease;
- raising awareness of the populations concerning MDA;
- developing a monitoring and evaluation programme;
- mapping of the disease in 5 municipalities of the capital.

## **ONCHOCERCIASIS**

***Pathogen*** -- Onchocerciasis is a parasitic disease caused by *Onchocerca volvulus*. Adult *O. volvulus* worms live in sub-cutaneous or deep nodules. The female *O. volvulus* releases microfilariae that migrate into the dermis and the eye. The vector, a female *Simulium damnosum*, takes microfilariae during a blood meal. These microfilariae, after successive moults, evolve to stage 3 larvae (L3), which are infective to humans when transmitted during a blood meal of the vector. In humans, these L3 larvae progress to maturity, form couples and produce microfilariae which preferentially migrate to the skin and the eye.

***Geographic Distribution*** -- Onchocerciasis is a widespread disease on the African continent where it is endemic in 30 countries where approximately 98% of the cases worldwide are located. It is also present in 6 countries of Latin America and in Yemen in the Arabian Peninsula.

***Burden of the disease*** -- Today it is estimated that 120 million people are at risk of onchocerciasis and that 17.7 million people are infected, 99% in Africa. Some 300,000 people are blind and at least 500,000 have severe visual impairment.

**Clinical presentation** -- Onchocerciasis is a progressive skin and eye disease. Massive and prolonged infestation leads to skin pathology causing pruritus, papular rash, sores, skin depigmentation, skin oedema, pachyderma, atrophy, and subcutaneous nodules. Ocular manifestations of onchocerciasis include punctate keratitis, sclerosing keratitis, iridocyclitis and uveitis. Lesions of the posterior segment of the eye include chorioretinopathy and optic atrophy. These changes are the most serious since they lead to a progressive decline in visual acuity and, ultimately, to blindness.

**Diagnosis** -- Diagnosis is made by demonstration of microfilariae in the skin.

**Treatment** -- The treatment of onchocerciasis has been revolutionized by ivermectin, which kills the microfilariae in the skin without the dangerous side effects of DEC used previously.

### **Epidemiology of onchocerciasis in Guinea**

The disease is prevalent in over 85% of the territory. It is present in 7 health regions of the country where 24 out of 33 health districts are endemic. Onchocerciasis is present in 8229 villages with a total of over three million persons exposed to the disease (Map 7).

The Onchocerciasis Control Programme in West Africa started its activities in Guinea in 1987 and has completely changed the epidemiological profile of onchocerciasis.

**Figure 7: Geographical Distribution of Onchocerciasis in Guinea**



(Source: WHO)

### ***The control of onchocerciasis in Guinea***

***Onchocerciasis in Guinea before OCP*** -- Guinea has a rather varied terrain with mountain ranges (the Fouta Djallon rises to 1421 meters, Mount Nimba to 1768 m). The average rainfall is relatively high and most rivers flow all year long; the hydrological network of Guinea is interspersed with numerous rapids that are almost continuous on small tributaries, and sometimes huge and complex on major rivers. All these hydrological characteristics favour the breeding of *Simulium damnosum*.

The disease had already been reported in different areas of Guinea well before independence by physicians of the “Service des grandes endémies”. In the 1960s entomological studies and clinical trials of DEC were undertaken on the Niger Basin (Guinea-WHO and a German-Guinean cooperation team). However, comprehensive epidemiological and entomological studies started only with the preparatory phase of the western extension of OCP in the 1980s.

There was a high level of transmission almost everywhere during the rainy season, and some villages, which were very close to the low water *Simulium* breeding sites, could also experience significant transmission rates during the dry season. Prior to the late 1980s, onchocerciasis was hyperendemic on all major river basins. Community microfilarial loads were high. The prevalence of eye lesions and blindness rates due to onchocerciasis were also high. The coastal river basins of the South-West, including the upper basins of the Rio Corubal and Konkouré were hypo-endemic. On the upper basins of the coastal rivers in the extreme south-east of Guinea, forest-type, non-blinding onchocerciasis was prevalent.

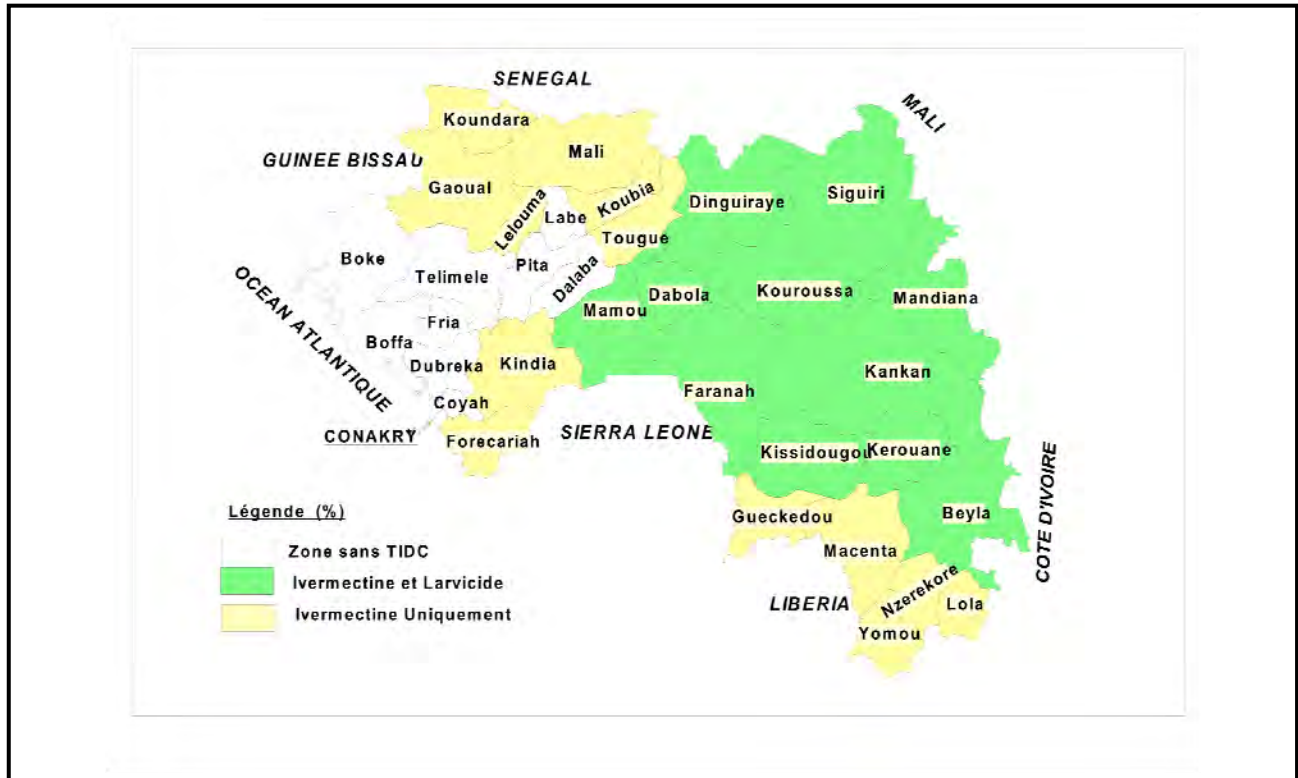
***The establishment of OCP in Guinea in 1987 and control strategies*** -- In 1987, at the outset of the onchocerciasis control programme in Guinea, the prevalence of the disease was higher than 60% in the savannah (Upper Guinea) area and the number of blind exceeded 20,000. The overall objective of OCP was to eliminate onchocerciasis as a public health problem and a barrier to socio-economic development.

Three strategies have been used since 1987 by the Ministry of Health and its partners:

- 1987 to 1997: vector control and ivermectin treatment by mobile teams;
- 1997 to 2002: vector control and community directed treatment with ivermectin (CDTI);
- from 2002 onwards, community directed treatment with ivermectin only.



**Figure 8: Regions of Implementation of the Various Strategies**



These strategies have had a dramatic impact: prevalences ranging between 88% and 43% dropped to 15% - 0%. From 2002, onchocerciasis was no longer a public health problem in Guinea. Vector control was stopped on all river basins and OCP was terminated.

***Onchocerciasis in the post-OCP era: the special intervention zones (SIZ)*** -- Despite this remarkable overall achievement, the epidemiological situation was not completely satisfactory in some areas (Map 9) referred to as the special intervention zones (SIZ). These areas are located along the upper Niger/Mafou basin and the Tinkisso basin. They cover 6 prefectures: Faranah, Dabola, Dinguiraye, Kissidougou, Kouroussa and Siguiri and comprise 2421 villages with a population of about 1 million inhabitants. In such zones, an enhanced scheme of ivermectin distribution was carried out from 2002 over a period of 5 years aiming at a geographical coverage of 100%, and a therapeutic coverage of 80%.

**Figure 9: Special Intervention Zones and their Extension**



In August 2005, an epidemiological evaluation was carried out in villages of the Kolenté and the Mongo / Kaba basins in the prefectures of Kindia and Mamou Forecariah. The prevalences were above the acceptable threshold of 5% and the community microfilarial loads (CMfl) above 0.5 Mf. The decision to extend SIZ to these regions was taken and 2 CDTI rounds per year were conducted. This resulted in a sharp decline in the prevalence and Cmfl as shown in tables 7 and 8 below.

**Table 6: Change in Prevalence in the SIZ Area between the Periods 2000-2002 and 2005-2007**

River Basin (No. of Villages Evaluated)	No. of Villages with Prevalence Adjusted < 5%		Average Prevalence %	
	2000-2002	2005-2007	2000-2002	2005-2007
Upper Niger (10)	6	9	4.97	1.47
Mafou (9)	7	9	3.40	1.19
Tinkisso (19)	15	19	1.54	0.85
<b>Total SIZ (38)</b>	<b>28 (73.7%)</b>	<b>37 (97.3%)</b>	-	-

**Table 7: Change in the Cmfl in the SIZ Area between the Periods 2000-2005 and 2005-2007**

River Basin (No. of Villages Evaluated)	No. of Villages with a Cmfl < 0.5%		Average Cmfl	
	2000-2002	2005-2007	2000-2002	2005-2007
Upper Niger (10)	10	10	0.119	0.042
Mafou (9)	9	9	0.109	0.045
Tinkisso (19)	19	19	0.069	0.034
<b>Total SIZ (38)</b>	<b>38 (100%)</b>	<b>38 (100%)</b>	-	-

To maintain the achievements of OCP and prevent the resurgence of the disease, it was recommended to continue with the CDTI strategy until 2012 at least. Data for the CDTI for 2009 are shown in Table 9 below.

**Table 8: CDTI Data for 2009**

<b>Administrative data</b>	
Health districts	24
Total number of Villages	8229
Villages treated	8208
Geographic coverage (%)	99,74%
<b>Populations</b>	
Total Population	3 172 139
Population treated	2 570 255
Therapeutic coverage (%)	81%
<b>No. of ivermectin tablets used</b>	6 649 517

(Source. PNLOC)

***Governmental, International and Non-governmental Organizations involved in the control of onchocerciasis in Guinea.***

- Programme National de Lutte contre l'Onchocercose et la Cécité (PNLOC).
- World Health Organization-APOC.
- Organisation pour la Prevention de la Cécité (OPC).

- Sightsavers.
- Helen Keller International.
- Mectizan Donation Programme.

### **Challenges**

- Continue epidemiological and entomological surveillance
- Continue geographic coverage to 100% and extend therapeutic coverage above 80% in onchocerciasis villages.
- Increase awareness for the acceptance of drugs.
- Training and / or retraining of health workers and community distributors for the management of CDTI.

## **SCHISTOSOMIASIS**

Schistosomiasis are infections due to parasites of the *Schistosoma* genus which can result in a chronic disease of the genito-urinary tract, the bowel or the liver.

**Pathogens** -- Adult worms live and mate within the mesenteric veins or the bladder. Some eggs enter the gut or the bladder mucosa and are excreted in stools or urine. The eggs hatch in water, releasing miracidia that grow in snails and produce thousands of cercariae. They penetrate the human skin within minutes after exposure and become schistosomula. Schistosomula develop into sexually active worms in the intestinal veins or venous plexus of the genitourinary tract, depending on species. The eggs appear in stools or urine 1-3 months after penetration of cercariae.

*Schistosoma haematobium* colonizes mainly the genito-urinary tract. *S. mansoni*, *S. japonicum*, *S. mekongi* and *S. intercalatum* colonize mainly the intestine and liver. This document is limited to *S. haematobium* and *S. mansoni*, the two species present in Guinea.

### **Geographic Distribution --**

<i>Schistosoma haematobium</i> :	Africa, the Middle East.
<i>Schistosoma mansoni</i> :	Africa, the Middle East, the Caribbean, Brazil, Venezuela, Suriname.
<i>Schistosoma intercalatum</i> :	Rain forest areas of central Africa
<i>Schistosoma japonicum</i> :	China, Indonesia, the Philippines
<i>Schistosoma mekongi</i> :	Cambodia and Laos

**Burden of the disease** -- Schistosomiasis is, after malaria, the second largest endemic parasitic disease. Approximately 600 million people are at risk of infection. It affects about 200 million people worldwide, and 20 million suffer the consequences of chronic infection with this parasite. The prevalence among children of school age is high.

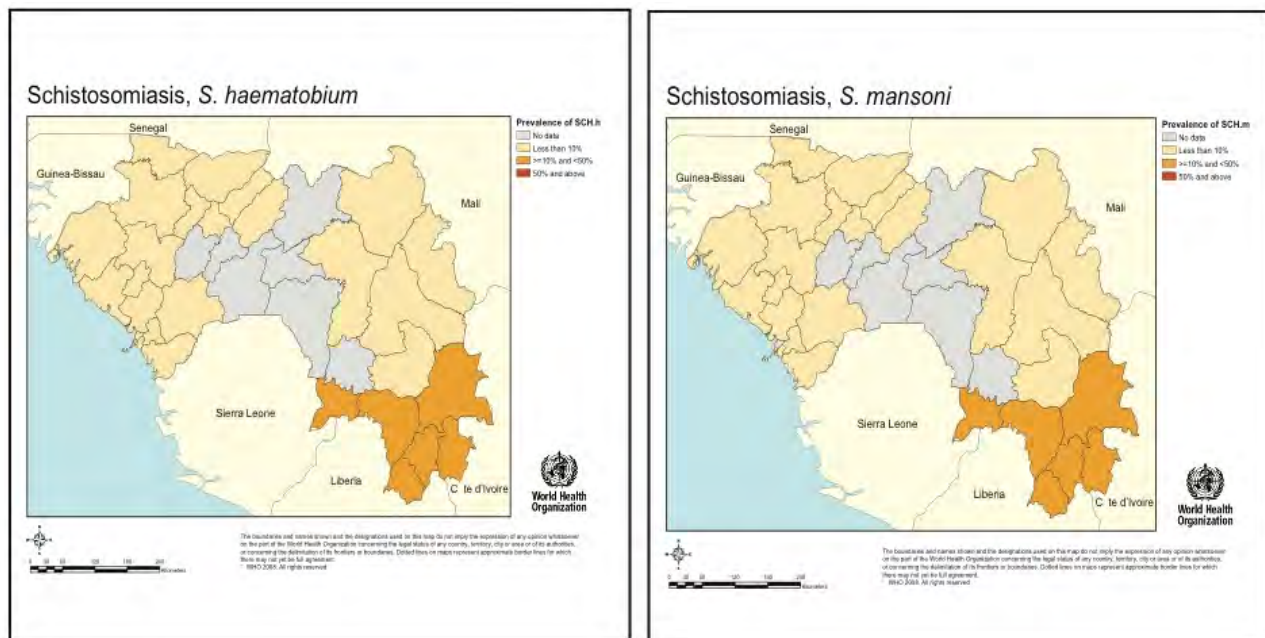
**Clinical presentation** -- The classic sign of urogenital schistosomiasis is haematuria. Fibrosis of the bladder and ureter, and kidney damage are common findings in advanced cases. Bladder cancer is also a possible late-stage complication. In women, urogenital schistosomiasis may present with genital lesions, vaginal bleeding, pain during sexual intercourse and nodules in the vulva. In men, urogenital schistosomiasis can induce pathology of the seminal vesicles, prostate and other organs. This disease may also have other long-term irreversible consequences, including infertility.

Intestinal schistosomiasis can result in abdominal pain, diarrhoea and blood in the stools. Liver enlargement is common in advanced cases and is frequently associated with an accumulation of fluid in the peritoneal cavity and hypertension of the abdominal blood vessels. In such cases there may also be an enlargement of the spleen.

**Diagnosis** -- The diagnosis is based on the evidence of *S. haematobium* eggs in urine and eggs of *S. mansoni* in the stools.

**Treatment** -- The treatment of schistosomiasis is based on the administration of praziquantel for uncomplicated cases. Advanced complications may require surgery.

**Figure 10: Prevalence of schistosomiasis in Guinea**



(Source: WHO)

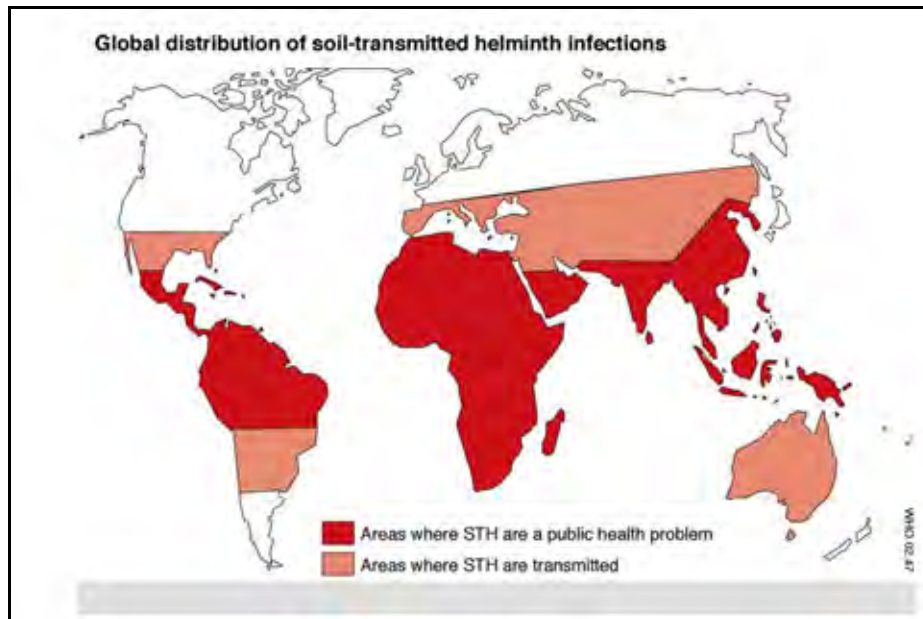
## SOIL TRANSMITTED HELMINTHIASIS

**Pathogen** -- Soil transmitted helminthiases (STH) are a group of parasitic diseases widely distributed throughout the world. The most important ones from a public health standpoint are due to the roundworm *Ascaris lumbricoides*, *Ankylostoma duodenale* (hookworm), and *Trichuris trichiuria*. The eggs of these parasites are released into the

stools of an infected person. The eggs mature in the soil and become infective to humans either by ingestion (*A. lumbricoides* and *T. trichiuria*) or percutaneously, (*A. duodenale*).

**Geographic Distribution** -- STH are widespread in the tropics and subtropics and are linked to poor sanitation. Recent estimates suggest that *A. lumbricoides* infects 1.221 billion people, *T. trichiura* 795 million, and hookworms 740 million. The greatest numbers of STH infections occur in the Americas, China and East Asia, and Sub-Saharan Africa.

**Figure 11: Geographical Distribution of STH in the World**



(Source: WHO)

**Burden of the disease** -- Soil transmitted helminthiases affect over 2 billion people in the world. STH infections rarely cause death. Instead, the burden of disease is related less to mortality than to the chronic and insidious effects on the hosts' health and nutritional status. They are a major cause of morbidity among children of school age in tropical and sub tropical areas. They are responsible for malnutrition, poor development, anemia, vitamin A deficiency and disability, with a negative impact on the level of education.

**Clinical presentation** -- The STH result in a wide range of symptoms with intestinal manifestations such as abdominal pain, diarrhoea, dizziness and weakness that may affect academic ability and be a handicap to the growth of children. Hookworm infection causes anaemia and intestinal bleeding.

**Diagnosis** -- The diagnosis is based on the microscopic identification of parasite eggs in the stools.

**Treatment** -- Soil-transmitted helminth infections are usually treated with albendazole or mebendazole. The two drugs are effective and well tolerated.

### ***Epidemiology and control of Schistosomiasis and STH in Guinea***

For practical purposes these two groups of diseases are investigated together in Guinea.

***Studies on the prevalence*** of intestinal parasitic infections were undertaken as part of preparations for the establishment of the School Health and Nutrition Component of the PASE project or as part of the OMVS activities.

- Between April and June 1995, a national survey was carried out to estimate the prevalence of helminthic infections among school children. The results of this survey were used to develop a programme for the distribution of anthelmintics (mebendazole 500 mg, praziquantel 600 mg) and micronutrients (iodine capsules dosed at 200 mg, iron, folic acid) in schools. The prevalences obtained were as follows:

<b>Parasite</b>	<b>Prevalence %</b>
<i>S. mansoni</i>	25
<i>S. haematobium</i>	19.9
<i>A. duodenale</i>	43.9
<i>T. trichiura</i>	13.5
<i>A. lumbricoides</i>	9.5

70% of the children had at least one helminthic infection, 63% had two and 8% had three infections. The prevalence was 74.3% among boys and 68% among girls. In the Forest Region, infections with *A. lumbricoides*, *S. mansoni* and *A. duodenale* were higher than in other Regions (range: 26-71%). In Conakry, infection with *Trichuris trichiura* was most common with a prevalence of 52%.

- Between January and May 1996, 1649 schoolchildren were examined in seven sous-prefectures. Prevalences were as follows:

<b>Parasite</b>	<b>Prevalence %</b>
<i>S. mansoni</i>	9.1
<i>S. haematobium</i>	9.8
<i>A. duodenale</i>	23
<i>T. trichiura</i>	21.5
<i>A. lumbricoides</i>	33.5
<i>Intestinal nematodes</i>	60

60% of children were affected by one parasite, 20.3% by two and 1.8% by at least three parasites. The prevalence of urinary schistosomiasis was 9.8% and that of intestinal schistosomiasis 1.9%.

- In 1999, another survey conducted in the same context showed the following situation:

<b>Parasite</b>	<b>Prevalence %</b>
<i>S. mansoni</i>	15.9
<i>S. haematobium</i>	9
<i>A. duodenale</i>	43.8
<i>T. trichiura</i>	9.4
<i>A. lumbricoides</i>	31.3

Table 9 below summarizes the changes in prevalence between the surveys of 1996 and 1999. It should, however, be noted that the samples are different in these two surveys and, therefore, comparisons should be interpreted with caution.



**Table 9: Results of 2 Surveys of school children carried out in 7 sous-préfectures by the school health program in Guinea**

Sous Préfectures	A. lumbricoides (%)		T. trichiura (%)		A. duodenale (%)		S. haematobium (%)		S. mansoni (%)	
	1996	1999	1996	1999	1996	1999	1996	1999	1996	1999
Ratoma	50,4	39,7	35,8	12,7	6,5	19,0	4,0	0,4	2,4	3,2
Boffa	51,6	15,6	34,0	14,1	25,6	36,0	0,8	0,4	----	0,4
Tugnifilly	32,7	16,7	29,4	11,8	34,0	54,1	----	1,0	0,4	----
Ditinn	2,1	4,6	16,9	15,9	34,5	13,8	0,5	0,4	6,6	0,4
Karifamoriah	17,3	45,2	2,5	2,0	8,0	52,8	5,6	1,6	2,8	1,6
Sengubedou	45,8	55,0	11,9	3,2	70,0	80,0	46,8	43,6	1,5	19,6
Samoe	21,6	41,4	16,0	5,6	20,0	74,1	14,0	26,3	47,5	86,1
Total	33,5	31,3	21,4	9,4	23,0	43,8	9,8	7,9	9,1	15,9

**Data from OMVS surveys.** The Organisation pour la mise en valeur du fleuve (OMVS) Sénégal adopted a strategy of managing the waters of the Senegal River by the construction of two dams: the Manantali dam and the Diama dam. These dams are intended, inter alia, to ensure sufficient irrigation for agriculture and the production of electricity, thereby creating jobs and stabilizing populations. The construction of these dams has profoundly changed the ecosystem of the river basin and promoted the emergence of water-borne diseases including schistosomiasis, and STH.

To assess the prevalence of these diseases, a survey was conducted on children aged 5 - 14 (whether they attended school or not), since the peak prevalence of schistosomiasis and STH is observed in this age group. This survey took place in the Middle and Upper Regions of Guinea. The results of the investigation were as follows:

*Urinary schistosomiasis:* Of the 900 urine samples examined, 17 contained eggs of *S. haematobium*: an overall prevalence of 1.9%. The table in Appendix 4 shows the prevalences obtained in the villages investigated.

*Intestinal schistosomiasis:* Of the 900 stool specimens examined 89 contained eggs of *S. mansoni*, i.e. an overall prevalence of 9.9%. The highest prevalence (52%) was observed in the Hore Fello school (Commune de Mamou), (Appendix 5).

Among the STH, *T. trichiura* was the most prevalent (Table 12).

**Table 10: Prevalence of STH in the Basin of the Senegal River in Guinea**

No. Examine	A. lumbricoides		T. trichiuria		A. duodenale		Total	
	Positive	%	Positive	%	Positive	%	Positive	%
900	3	0.3	31	3.4	4	0.4	38	4.2

*Schistosomiasis data reported through the health information system.* Figures given below are obtained from routine reports received from districts through the Système National d'Information et de Gestion de la Santé<sup>12</sup> (SNIGS) from 2000 to 2005.

*Urinary schistosomiasis* -- Between 2000 and 2005, 16,649 cumulative cases were reported to the Ministry of Health. The area most affected was the Forest Region with 2,480 cases in the prefecture of Gueckedou, and 1,513 cases in Macenta. In the Upper Region, the prefectures of Siguiri and Dinguiraye notified 1,589 and 1,207 cases, respectively. The Middle Region reported 1,394 cases from the prefecture of Koundara. The prefectures the least affected were Boffa (1 case) and Dubréka (2 cases) in the Lower Region; Lélouma (3 cases), Tougué (4 cases) and Dalaba (6 cases) in the Middle Region.

*Intestinal schistosomiasis* -- A total of 84,625 cumulative cases were reported between 2000 and 2005 for the whole country. The prefectures of the Forest Region were the most affected by this form of schistosomiasis: Gueckedou: 20,682 cases, Kissidougou: 11,196 cases, N'Zérékoré: 7,289 cases, Beyla: 5,501 cases, Lola: 4,922 cases, Macenta: 4,416 cases and Yomou : 3,343 cases. In the Upper Region, Kerouane notified 5,699 cases. In the Middle Region, Mamou notified 2,433 cases. The least affected prefectures were located in Lower Guinea: Boffa (1 case) and Dubréka (8 cases).

#### ***Control of schistosomiasis and STH in Guinea***

Strictly speaking, there is no specific programme for the control of schistosomiasis and STH in Guinea. Nevertheless, control activities are currently undertaken in various settings:

- in health centres through the expanded programme on immunization;
- during field campaigns;
- through the school health and nutrition programme,
- through OMVS which, from 21 to 23 May 2010, undertook the distribution of praziquantel and mebendazole in 10 prefectures along the Senegal river in Guinea, where 1,745,475 school children and 436,368 children were treated. It is planned to renew the campaign in 2011, and discussions are underway to extend this campaign for five years.

<sup>12</sup> National Health Information and Management System

Guinea had planned to target the school-age population (and adults at risk of schistosomiasis), for the simultaneous administration of praziquantel associated with albendazole or with mebendazole. Distribution of drugs in schools was carried out in phases from 1996 to 2000:

Phase	Period	No. of children treated
Test phase	1996 – 1997	36,455
Extension 1	1997 – 1998	344,259
Extension 2	1998 – 1999	575,771
Extension 3	1999 – 2000	136,074
Total		1,092, 559

***Strategy for implementation of the control of schistosomiasis and STH in Guinea***

The strategy for the control of schistosomiasis and intestinal helminths is based on drug distribution to people exposed in the endemic districts. This activity takes place in the framework of the integrated control of NTDs. Broadly speaking, in areas co-endemic with lymphatic filariasis and onchocerciasis, the entire population of over 5 years will be treated with albendazole and ivermectin, thus covering intestinal helminths. The administration of praziquantel among school-age children and adults at risk will be done 15 days later to control schistosomiasis. In addition, during the “Journées de l’Enfant” (Days of the child), a distribution of mebendazole will be made to school age children and will constitute the second annual campaign for the control of STH.

***Governmental, International and Non-governmental Organizations involved in the control of schistosomiasis and STH in Guinea.***

- Ministry of Health and Public Hygiene
- Ministry of Education, School and University Health Service
- WHO
- UNICEF
- OMVS: programme in 10 prefectures bordering the River Senegal.
- HKI
- Deworming the World: Gift of MBZ and pledge of PZQ
- WFP: active in school canteens in 20 prefectures where income per capita and education are the lowest in the country.
- Plan Guinée: active in the Forest Region.

### **Challenges**

Currently the drug supply depends entirely on donations from various sources. The continuity and regularity of these donations is crucial. From 1996 to 2007, the World Bank financed the purchase of praziquantel, mebendazole, iron and folic acid. However, there have been interruptions in the drug supply. Since 2009, a number of non-government organizations (NGOs) have promised drug donations. The challenges are essentially:

- Regular, long-term drug supply.
- Logistics for the distribution of drugs, and for monitoring and evaluation. there is a network of distribution, but no funds are available for transport to the periphery,
- Monitoring and supervision at all levels of the distribution chain.
- Harmonization of the activities between the different partners.
- Coverage of children not attending school and adults at risk.
- Training and / or retraining of teachers and health workers.

## **OPTIONS FOR INTERVENTIONS**

### **Summary of NTDs and their impact on populations**

Trachoma is prevalent in part of the country. Epidemiological surveys indicate that over three million people are exposed to the disease, and more than 39,000 cases of trachomatous trichiasis are at risk of blindness if no action is taken.

Lymphatic Filariasis is endemic in seven regions out of eight (except Conakry) with more than eight million people at risk.

Onchocerciasis is prevalent in over 85% of the country. It affects 24 districts in which there are over 8,000 onchocerciasis villages, totalling more than 3 million people at risk who require annual treatment to prevent complications that can lead to blindness.

Helminthiases (schistosomiasis, intestinal helminths) affect approximately 70% of children of school age; 60% are affected by two helminthiases and 8% by three.

Studies in recent years have highlighted the wide geographical distribution and the significant level of endemicity of the five above-mentioned diseases. Most of these diseases are co-endemic in many regions.

### **Success of NTDs control programmes**

To date, only the control of river blindness, thanks to the support of OCP, APOC and their collaborating NGDO partners, has been organized in a solid, sustainable and effective way. The result is a real success, with more than 3 million people treated annually in over 8,000 villages. 1997 drug distributors form the network of the MDA

programme. About 14,000 drug distributors have been trained and are supervised by 218 health centre staff in 24 health districts. The effect of mass treatment with ivermectin is monitored regularly by epidemiological assessments in 52 sentinel villages, to determine the prevalence of onchocerciasis, and by entomological surveillance at 15 catching points to determine the level of transmission by the vector. This situation itself represents a formidable success. There were other limited interventions against NTDs and although they were successful, their effect was not lasting, as they were not sustained.

For trachoma control, an important step was taken in preparation for a future large-scale intervention: 12 operators were trained in 2004 for the surgery of trachomatous trichiasis. In addition, 147 head nurses of health centres for eye care and 3,500 community distributors were trained to screen for trachomatous trichiasis in areas endemic for this disease.

### **Interventions specific to certain diseases**

Surgery of trachomatous trichiasis was performed on 3193 cases from 2004 to 2009. This is far short of the estimated 39,000 cases awaiting care.

Cases of hydrocele due to lymphatic filariasis are managed by the hospital surgery on an individual basis and are paid out of pocket.

In the strategy for the control of lymphatic filariasis it is planned to introduce a component for the management of lymphoedema and elephantiasis through a specific care and hygiene programme.

Specific activities against schistosomiasis and STH are carried out either through the school health department, or as part of the OMVS health plan.

### **Mass Drug Administration**

The options for interventions are based primarily on mass drug administration.

#### ***Integration***

The merger of the onchocerciasis and trachoma programmes is the backbone for the integration of the control of filariasis, schistosomiasis and STH. A national strategic plan has been developed to this effect.

#### ***Guinean experience in the mass distribution of medicines***

In addition to its extensive experience in MDA for control of river blindness, Guinea has experience in other large projects such as the integrated campaign of vaccination against polio, the administration of vitamin A – mebendazole against STH, and the distribution of Long Lasting Impregnated Bed nets against malaria, undertaken during national immunization days and "days of the child" twice per year; and also mass campaigns against yellow fever.

## GAP ANALYSIS

Health activities to control or eliminate neglected tropical diseases at the national level have been rare in Guinea.

The health budget is insufficient and this had serious consequences on the health services in recent years. Neglected tropical diseases are an immense problem and, linked to poverty, create a vicious circle that prevents the populations from moving towards physical, social and economic well-being. As in many developing countries, the emergence of non-communicable diseases and epidemics such as AIDS has further increased the burden on the meagre health budget. All these factors contribute to the inability of the health services to develop nationwide, sustained, interventions to control NTDs and improve the health of populations in need.

Since 1986, Guinea has been part of the group of West African Nations that have pledged to eliminate onchocerciasis as a public health problem and obstacle to socio-economic development. This commitment has resulted in a resounding success, as mentioned earlier in this document, and is therefore a model to follow and a foundation to build on for other interventions. On a smaller scale, and sometimes on an ad hoc basis, other limited interventions have been undertaken such as the control of trachoma and STH. However, their sustainability has never been achieved over a long enough period to produce lasting beneficial effects for the populations affected.

Given the success of the onchocerciasis programme and the experience gained, Guinea proposes to develop an integrated programme to control neglected tropical diseases. A realistic and effective programme can be designed to maximize the use of resources, and to achieve greater cost-effectiveness

The health map of the country shows that most health districts are co-endemic for many diseases. Coordinated action would therefore reduce the costs of logistics, staff training, information, education and communication.

The onchocerciasis control programme undertakes the distribution of medicines in the affected communities at least once a year. Guinea has decided to extend this capability to other blinding diseases, including trachoma, in the form of a control programme against onchocerciasis and blindness (PNLOC). A first step towards integration has, therefore, already been taken.

The drugs used are often effective against several parasites and therefore, the mass distribution of medicines, once a year, can treat and / or prevent many diseases at a time: onchocerciasis, LF and STH. Adding drugs for other diseases present in the same area, such as schistosomiasis and trachoma, should not constitute much additional effort.

Experiences with international organizations and NGOs in activities such as vaccination campaigns suggest that with sustained support, substantial results can be achieved and consolidated in the long term.

To implement a multiple - disease control project as Guinea plans, it will be necessary to:

1. **Strengthen coordination and planning activities.** The Ministry of Health recently established a coordinating committee attached to PNLOC and a steering committee for the fight against neglected tropical diseases. The steering committee is composed of, among others, the focal point for each disease, and representatives of the partners, and it is responsible for:
  - coordinating and planning intervention strategies;
  - monitoring / evaluating the project;
  - advocating the project to policy makers, donors and communities to obtain their commitment to the strategy and mobilize the resources necessary to implement activities;
  - promoting the exchange of experiences (good practices, lessons learned) to improve interventions;
  - sharing information at all levels.
2. **Set clear targets, monitor activities and evaluate their results.** It is important to monitor activities to ensure that targets are being met, and to promptly detect faults or errors that need to be corrected in order to improve the overall performance of the programme. Evaluation results should be discussed with partners and donors to encourage sustained support.
3. **Ensure solid training at all levels.** It is important to ensure that stakeholders at each level of the pyramid are trained and understand the objectives and the importance of their activity. Training sessions and retraining should be an integral part of programmes.
4. **Conduct further epidemiological investigations.** While the distribution and prevalence of certain diseases such as onchocerciasis are known, it is not the case for other diseases for which entire regions have not been studied, or for which data are old. In order to better plan activities and assess the quantity of drugs needed, it will be necessary to undertake further surveys/investigations to determine the extent of diseases and the numerical importance of cases.
5. **Organize information and communication sessions.** It is sometimes difficult for people who have no apparent manifestations of the disease to understand why they should enroll in a programme of mass chemotherapy, and take medication. To ensure compliance and adequate therapeutic coverage, sessions to inform and raise awareness of the population should be held as an integral part of field activities.
6. **Strengthen the existing health system.** From the beginning of any project, it is important to involve the national health system, especially at peripheral level, to ensure the smooth running of the activities in the long term.

7. **Ensure sustainable funding.** Most drugs used against the targeted diseases come from donations. However, resource mobilization is necessary to secure the purchase of other medication, and especially to finance inventory management, training, drug distribution and programme monitoring. MDA networks already exist in most regions of the country. However, support for their operations should be secured and new networks should be established in areas that are not yet covered.



## APPENDIX 1: SITUATION OF TRACHOMA IN GUINEA

Region	District	Total Population of the District in 2010	%TT	Population Group Surveyed	Year of Survey	% AT (1-9 yrs)	Indicator of Active Trachoma	Type of Survey
Boké	Boffa	226,711	NE			NE		
Boké	Boké	433,909	NE			NE		
Boké	Fria	116,860	NE			NE		
Boké	Gaoual	197,408	2.00	F>15 ans	2002	23	TF	RAT
Boké	Koundara	131,327	1.20	F>15 ans	2002	25	TF	RAT
Faranah	Faranah	213,372	1.70	F>15 ans	2001	40	TF	ES
Faranah	Dabola	172,886	4.70	F>15 ans	2001	36	TF	ES
Faranah	Dinguiraye	196,274	4.50	F>15 ans	2001	31	TF	ES
Faranah	Kissidou-gou	290,460	1.40	F>15 ans	2001	40	TF	ES
Kankan	Kankan	422,093	2.80	F>15 ans	2001	20	TF	ES
Kankan	Kerouane	354,338	1.20	F>15 ans	2001	20	TF	ES
Kankan	Kouroussa	232,258	2.60	F>15 ans	2001	34	TF	ES
Kankan	Mandiana	286,058	3.80	F>15 ans	2001	23	TF	ES
Kankan	Siguiri	405,196	1.60	F>15 ans	2001	23	TF	ES
Kindia	Kindia	414,742	NE			NE		
Kindia	Dubréka	211,240	NE			NE		
Kindia	Coyah	181,609	NE			NE		
Kindia	Forécariah	288,592	NE			NE		
Kindia	Télimélé	326,694	NE			NE		
Labé	Labé	363,245	NE			NE		
Labé	Koubia	132,730	0.90	F>15 ans	2002	22	TF	RAT
Labé	Lélouma	197,367						
Labé	Mali	300,511	0.90	F>15 ans	2002	22	TF	RAT
Labé	Tougué	165,215	1.20	F>15 ans	2002	22	TF	RAT
N'zerekore	Beyla	245,174	1.20	F>15 ans	2001	20	TF	ES
N'zerekore	Guecke-dou	502,010	NE			NE		
N'zerekore	Macenta	429,014	NE			NE		
N'zerekore	N'zerekore	409,381	NE			NE		
N'zerekore	Lola	194,028	NE			NE		
N'zerekore	Yomou	210,463	NE			NE		
Mamou	Mamou	340,069	NE			NE		
Mamou	Dalaba	196,473	NE			NE		
Mamou	Pita	345,649	NE			NE		
Conakry	Dixinn	213,327	NE			NE		
Conakry	Kaloum	107,364	NE			NE		
Conakry	Matam	227,468	NE			NE		
Conakry	Matoto	685,790	NE			NE		
Conakry	Ratoma	548,492	NE			NE		
	TOTAL	10,915,797						

ES: Epidemiological survey

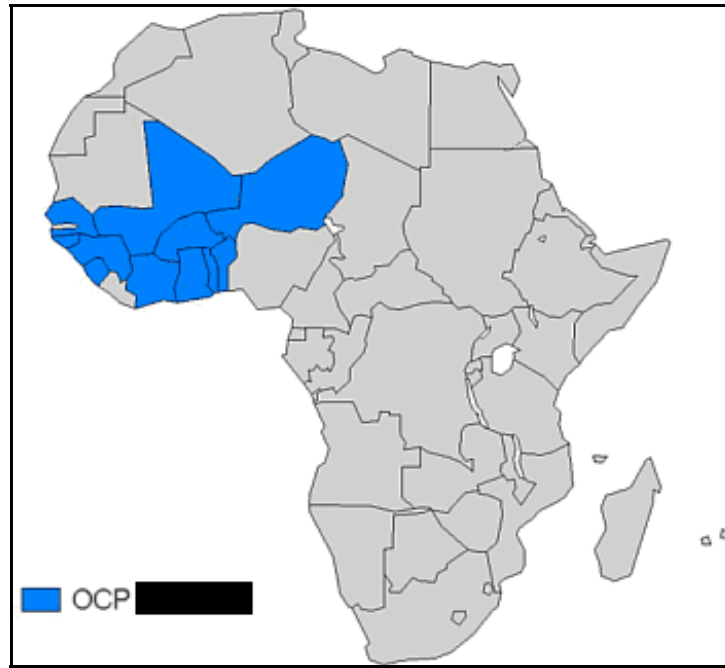
RAT: Rapid assessment of trachoma

NE: Not evaluated

## APPENDIX 2: OVERVIEW OF NEGLECTED TROPICAL DISEASES IN GUINEA

Disease	Pathogen	Distribution	Exposed Population
Onchocerciasis	Onchocerca volvulus	24 Health Districts 8229 villages	> 3 million
Lymphatic Filariasis	Wuchereria bancrofti	25 Health Districts	> 8 million
Schistosomiasis	Schistosoma haematobium, Schistosoma mansoni	Upper Region Forest Region	>70% schoolchildren
Soil transmitted Helminths	Ankylostoma duodenale Ascaris lumbricoides Trichuris trichiuria	38 Health Districts	> 8 million
Trachoma	Chlamydia trachomatis	15 Health Districts	> 3 million

## APPENDIX 3: AREA OF THE ONCHOCERCIASIS CONTROL PROGRAMME IN WEST AFRICA (OCP)



# APPENDIX 4: AREA OF THE AFRICAN PROGRAMME FOR ONCHOCERCIASIS CONTROL (APOC)



## APPENDIX 5: PREVALENCE OF URINARY SCHISTOSOMIASIS IN 18 VILLAGES / SCHOOLS IN THE SENEGAL RIVER BASIN IN GUINEA

Villages / School	No. Examined	Results	
		Positive	(%)
Tamagaly	50	1	2
Tolo	50	0	0
Dounet	50	0	0
Timbo	50	0	0
Bourouwil	50	1	2
Urban commune of Mamou	50	0	0
Urban commune of Labe	50	0	0
Tountouroun	50	0	0
Garambe	50	0	0
Franco-arabe Dheppere	50	3	6
Daralabe	50	1	2
Hafia	50	2	4
Urban commun of Dabola	50	0	0
Dogomet	50	0	0
Koolo	50	7	14
Arfa moussaya	50	0	0
Bissikirima	50	2	4
Banco	50	0	0
Total	900	17	1,9

## APPENDIX 6: PREVALENCE OF *SCHISTOSOMA MANSONI* IN 18 VILLAGES / SCHOOLS IN THE SENEGAL RIVER BASIN IN GUINEA

Villages/Schools	No. of Samples Examined	Results	
		Positive	(%)
Tamagaly	50	7	14,0
Tolo	50	9	18,0
Dounet	50	8	16,0
Timbo	50	12	24,0
Bourouwil	50	11	22,0
Commune urbaine de Mamou	50	26	52,0
Commune urbaine de Labe	50	2	4,0
Tountouroun	50	0	0
Garambe	50	0	0
Franco-arabe Dheppere	50	0	0
Daralabe	50	2	4,0
Hafia	50	3	6,0
Commune urbaine de Dabola	50	0	0
Dogomet	50	3	6,0
Koolo	50	0	0
Arfa Moussaya	50	0	0
Bissikirima	50	3	6,0
Banco	50	3	6,0
Total	900	89	9,9

## APPENDIX 7: PARTICIPANTS TO MEETINGS

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