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GHANA NTD MASTER PLAN 2021 - 2025

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GHANA NTD MASTER PLAN 2021 - 2025

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Abbreviations and Acronyms

CDD	Community Drug Distributors
CDTi	Community directed treatment with ivermectin
CHPS	Community Health Planning Services
CM	Case management
CSO	Civil Society Organization
DHIMS	District Health Information Management System DHIMS
DHMT	District health management team
FDA	Food and Drugs Authority
FGS	Female genital schistosomiasis
G2D	Grade 2 Disability
GDP	Gross Domestic Product
GNP	Gross National Product
HAT	Human African Trypanosomiasis
ICCC	Intra-Country Coordination Committee
ICD	Institutional Care Division
IDSR	Integrated disease surveillance and response
IEC	Information Education Communication
IRS	Indoor residual spraying
IVM	Integrated vector management
LF	Lymphatic filariasis
LLIN	Long-Lasting Insecticide treated Nets
LNOB	Leave no on behind
MDA	Mass drug administration
MLGRD	Ministry of Local Government & Rural Development
MICS	Multi-Indicator Cluster Survey
MoFA	Ministry of Food & Agriculture
MoFEP	Ministry of Finance & Economic Planning
MWRWH	Ministry of Water Resources, Works and Housing
MSWR	Ministry of Sanitation and Water Resources
NHIS	National health insurance scheme
NTD	Neglected tropical diseases

NGO	Non-Governmental Organization
NID	National Immunization Day
Oncho	Onchocerciasis
PCT	Preventive chemotherapy
PHEIC	Public health emergencies of international concern
PHC	Primary Health Care
REMO	Rapid Epidemiological Mapping of Onchocerciasis
SAFE	Surgical, Antibiotics, Facial cleanliness, Environmental improvement
SBCC	Social and behaviour change communication
SCH	Schistosomiasis
SHEP	School Health Education Programme
STH	Soil-transmitted helminthiasis
SWOT	Strengths, weaknesses, opportunities, and threats
TRA	Trachoma
WASH	Water, sanitation and hygiene
WHO	World Health Organization
WHO/AFRO	World Health Organization Regional Office for Africa

Key Definitions

Control: Reduction of disease incidence, prevalence, morbidity and/or mortality to a locally acceptable level as a result of deliberate efforts; continued interventions are required to maintain the reduction. Control may or may not be related to global targets set by WHO.

Elimination (interruption of transmission): Reduction to zero of the incidence of infection caused by a specific pathogen in a defined geographical area, with minimal risk of reintroduction, as a result of deliberate efforts; continued action to prevent re-establishment of transmission may be required. Documentation of elimination of transmission is called verification.

Elimination as a public health problem: A term related to both infection and disease, defined by achievement of measurable targets set by WHO in relation to a specific disease. When reached, continued action is required to maintain the targets and/or to advance interruption of transmission. Documentation of elimination as a public health problem is called validation.

Eradication: Permanent reduction to zero of the worldwide incidence of infection caused by a specific pathogen, as a result of deliberate efforts, with no risk of reintroduction.

Hygiene: Conditions or practices conducive to maintaining health and preventing disability.

Integrated vector management: A rational decision-making process to optimize the use of resources for vector control.

Mass drug administration: Distribution of medicines to the entire population of a given administrative setting (for instance, state, region, province, district, sub district or village), irrespective of the presence of symptoms or infection; however, exclusion criteria may apply. (In this document, the terms mass drug administration and preventive chemotherapy are used interchangeably.)

Morbidity: Detectable, measurable clinical consequences of infections and disease that adversely affect the health of individuals. Evidence of morbidity may be overt (such as the presence of blood in the urine, anaemia, chronic pain or fatigue) or subtle (such as stunted growth, impeded school or work performance or increased susceptibility to other diseases).

Monitoring and evaluation: Processes for improving performance and measuring results in order to improve management of outputs, outcomes and impact.

Platform: Structure through which public health programmes or interventions are delivered.

Preventive chemotherapy: Large-scale use of medicines, either alone or in combination, in public health interventions. Mass drug administration is one form of preventive chemotherapy; other forms could be limited to specific population groups such as school-aged children and women of childbearing age. (In this document, the terms preventive chemotherapy and mass drug administration are used interchangeably).

FOREWARD

NTD Master plans, are essential components for effective planning and implementation of sustainable NTD programmes. It provides programme goals, objectives and a 3–5 year strategy based on extensive situation analysis, and addresses all components of the NTD programmes relevant to the country. It enhances synergies among various NTD initiatives such as Guinea Worm Eradication (GWE) and Lymphatic Filariasis Elimination (LFE). It also provides the basis for integrated or linked NTD project plans and includes costing and financing requirements for effective NTD programme performance. In addition, the master plan provides a platform for integrated planning and costing and for resource mobilization for the NTD programme. It also enhances partner coordination and alignment with national priorities. The NTD programme master plan also includes scenarios and strategies for financial sustainability that link to the health sector budgeting and planning cycles and encourages strong linkages with other programmes within and outside the health sector in each country.

This master plan describes the goal, objectives and the strategy for controlling or eliminationg neglected tropical diseases in Ghana for the period 2021 to 2025. The content was developed through a review of relevant documents, evaluation of the implementation of the previous version of the NTD masterplan (2015-2020) and extensive consultation with key stakeholders of the NTD programme.

The diverse nature of neglected tropical diseases and their control and elimination processes require cross-sectoral collaboration to respond. In addition, integration of the interventions and the activities for controlling or eliminating these disease are essential to ensure judicious use of time and resources and for maximum impact.

It is my hope that this master plan would provide a platform for integration as well as joint planning and implementation among NTD stakeholders in Ghana.

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DIRECTOR GENERAL, GHANA HEALTH SERVICE

Executive Summary

Neglected Tropical diseases (NTDs) represent a group of 20 diseases that affect more than 1 billion people globally. Ghana is endemic for 14 out of the 20 NTDs identified by WHO. These include: Lymphatic Filariasis, Onchocerciasis, Schistosomiasis, Soil-transmitted helminths (STH), Buruli ulcer, Guinea worm, Leprosy, Yaws, human African trypanosomiasis (HAT), Rabies, Cutaneous Leishmaniasis, Trachoma, Scabies and Snake bite envenoming. Guinea worm has been eradicated and trachoma eliminated as a disease of public health importance in Ghana. As the current Ghana NTD Master Plan (2016 – 2020) elapsed there is the need to review and update the existing plan and make it relevant for the next couple of years, in line with the WHO 2021 – 2030 NTD roadmap. In order to enhance this process, an evaluation of the Ghana NTD programme activities was undertaken.

Notable achievements of the NTD programme include: Guinea worm eradication, elimination of trachoma, interruption of transmission of LF in many districts, reducing the populations needing interventions, improved case management, HAT control, awareness creation, provision of guideline and direction for researchers, programme managers and other stakeholders to design country specific solutions. In general, the evaluation revealed that the activities of the NTD programme are likely to be sustained. The NTD programme most often addressed the needs of the programme beneficiaries. The NTD programme often sustained access to diagnostics, essential medicines, and morbidity control, although these were considered to be inadequate. This however is not without challenges.

Some challenges to NTD programme activities were also identified, with the potential to affect the sustainability of the programme. Notable among them were inadequate funding, inadequate integration and collaboration with other stakeholders, inadequate human capacity, limited research, and suboptimal of NTD data. Whiles developing a master plan has streamlined and given focus to the programme management and its partners, the programme manages different partners with different focus. As such, designing standard tools and guidelines for all stakeholders will improve collaboration and efficiency of the NTD programme. Integration of NTD activities between diseases, as well as into the general services provisions at health facilities and communities, will reinforce the activities, M&E and surveillance efforts of the programme. The significant changes identified to address the needs of the programme and its beneficiaries include: advocacy and funding, increasing staff needs and expertise, focus on community ownership of activities and expansion of community drug distributors (CDDs) activities to include behaviour change communication, operational research to address existing challenges, collaboration with other sectors such as WASH, M&E plans with emphasis on process indicators in addition to input and outcome indicators (process indicators will ensure that interventions are well implemented).

In line with the above findings and the WHO targets for the different NTDs in the 2030 roadmap, the current Ghana NTD master plan for the period 2021 - 2025 was developed to guide programme activities. It outlines specific, measurable targets for 2025 for the eradication, elimination and control of all NTDs endemic in each country, as well as cross-cutting targets. The strategies and approaches for achieving the targets, with cross-cutting themes for several diseases are clearly defined. Programme performance and outputs will be monitored regularly and evaluated appropriately.

Introduction

The African Region bears close to 40% of the global burden of neglected tropical diseases (NTDs). All the 47 countries in the Region are endemic for at least one NTD, and 36 of them (78%) are co-endemic for at least five of these diseases. By impairing the physical and intellectual capacities of the affected persons and because they thrive in areas where access to quality healthcare, clean water and sanitation is limited, NTDs perpetuate a cycle of poverty.

Comprehensive multi-year plans for the control of all NTDs that are relevant in country, called *NTD Programme Master Plans*, are essential strategic documents for governments to effectively plan and implement sustainable NTD programmes in the African region. Each national NTD programme's comprehensive multi-year plan (the NTD Master plan) provides programme goals, objectives and year strategy based on extensive situation analysis, and addresses all components of the NTD programmes relevant to the country. It enhances synergies among various NTD initiatives, provides the basis for integrated or linked NTD project plans and includes costing and financing requirements for effective NTD programme performance. The country NTD Master plan will also form the basis for harmonized implementation and performance monitoring of all NTD interventions in a country.

The proposed NTD Master Plan (2021-2025) governs the prevention, control and, where feasible, elimination and eradication of neglected tropical diseases. It aligns with the NTD Roadmap '*Ending the neglect to attain the Sustainable Development Goals A road map for neglected tropical diseases 2021–2030*[1]. The aim of the Master Plan is to be a tool for the government to plan for all NTD programmes in the country which facilitate alignment among partners and stakeholders for a joint and complementary support to countries and to accelerate progress towards the prevention, control, elimination, and eradication of all relevant NTDs in Members States. It provides all partners working on NTDs in the African region with a harmonized tool that will facilitate joint support to countries.

The Master Plan outlines specific, measurable targets for 2021 – 2025 for the elimination and control of all NTDs endemic in each country, as well as cross-cutting targets aligned with WHO's Thirteenth General Programme of Work 2019-2023[2], and the SDGs. It includes the strategies and approaches for achieving these targets, with cross-cutting themes for several diseases, and moves towards the prevention of infections and alleviation of the suffering of people affected by WHO's expanded portfolio of 20 diseases and disease groups, as well as how this contributes to attaining the SDGs. The Master Plan is inclusive of all diseases categorised as NTDs by the WHO.

Progress in implementing planned activities as well as the programme performance and outputs will be monitored regularly and evaluated at appropriate intervals by the government. The strategic plan will be the framework for coordination, harmonization, and alignment of both central and sub-national governments, as well as partners. Therefore, consensus on the content will enhance commitment and accountability of all stakeholders for success in resource mobilization.

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[1] WHO. Ending the neglect to attain the Sustainable Development Goals: a road map for neglected tropical diseases 2021–2030. Available at https://www.who.int/neglected_diseases/Revised-Draft-NTD-Roadmap-23Apr2020.pdf. Accessed on July 21, 2020.

[2] WHO. The Thirteenth General Programme of Work, 2019–2023. Available at https://apps.who.int/iris/bitstream/handle/10665/324775/WHO-PRP-18.1-eng.pdf. Accessed on August 1, 2020.

The integration of NTDs into the national health system is critical, therefore the NTD Master Plan should be integrated and reflected into the national health development plans, including the national health insurance.

This document is divided into three main sections: Operating Context, Programmatic Targets and Operational Framework.

PART 1:
NTD SITUATION ANALYSIS

Section 1.1. National Priorities and the national, regional and global NTD Commitments

Introduction

Neglected Tropical Diseases (NTDs) are infections of poverty affecting the most impoverished in society. The World Health Organization (WHO) has identified 20 NTDs that are amenable to control or elimination. More than a billion people suffer from one or more of these NTDs, and the African continent bears approximately 50% of the global burden of NTDs. Ghana is a West African country, endemic for 14 out of the 20 NTDs namely, Lymphatic Filariasis, Onchocerciasis, Trachoma, Schistosomiasis, Soil transmitted helminthiasis, Buruli ulcer, Yaws, Leprosy, Guinea worm, Human African Trypanosomiasis (HAT), Cutaneous leishmaniasis and Rabies, scabies, and snake bite envenoming.

To help combat NTDs, the WHO developed the 2012-2020 Global Road Map for the elimination of NTDs, followed by the 2013 WHA resolution on NTDs (WHA66.12). The 2013 African Resolution on NTDs and the Regional Strategic Plan on NTDs in the African Region 2014–2020 were also developed as a way of implementing the WHO global roadmap and the 2013 WHA resolution. In 2020 the WHO developed its new 2021-2030 NTD roadmap, in line with the 13th General Programme of Work (GPW 13) and the Sustainable Development Goals, (SDGs), especially SDG 3 – Target 3.3. The 2021-2030 roadmap aims at attaining universal health coverage, and target the control, elimination, and eradication of NTDs in disease specific contexts. Thus, this also presents an opportune moment for Ghana to realign its strategies and framework in line with the global NTD roadmap.

The Ghana government is very much concerned about these diseases and has put in place the national master plan to address the situation in an integrated manner and link NTD plans to include costing and financing requirements. A strategic plan for the Neglected Tropical Diseases Programme (NTDP) has as its vision "Ghana free of NTDs and its associated morbidities and disabilities".

The goal is to improve on the capacity of the GHS to establish an integrated NTDs programme capable of delivering interventions to prevent, control, eliminate or eradicate the neglected tropical diseases by the year 2025.

The Ghana NTD Master Plan is a comprehensive multi-year plan (2021-2025) that addresses all the components of the NTD programme spelt out in this document. It includes preventive chemotherapy and case management of NTDs and is based on national and international strategic priorities and not disease specific. It will rely on integration and co-implementation and captures cost and financial plan for sustainability. This document provides the basis for national, regional and district annual work-plans.

It also forms the basis for harmonizing the joint support of all partners working in NTD, in terms of resource mobilization, information sharing, monitoring and evaluation and periodic reviews.

The Ghana NTD master plan is organized in three parts: situation analysis, NTD strategic agenda and implementing strategy. There is also a section on detailed budget plan as well as annexes.

Several NTDs such as Trachoma, Lymphatic Filariasis, Onchocerciasis, Schistosomiasis and Soil-transmitted Helminths overlap geographically. Furthermore, the same drugs for treatment and drug delivery strategies are employed for some of the diseases. In view of the existence of these common factors, there is need to integrate these related activities in order to maximize available resources and rationalize the operation of the various programmes. Tackling these diseases together will go a long way to increase knowledge in the causes, prevention and treatment of these diseases and produce the desired attitudinal and behavioural changes in a harmonized and cost-effective way, and improve country led sustainability strategies.

Since its inception, the NTD programme has worked to address the needs of its beneficiaries. Access to diagnostics, essential medicines and morbidity control were often sustained, although not without challenges. Other achievements of the NTD programme include: Guinea worm eradication, elimination of trachoma as a public health problem, interruption of transmission of LF in 99 out of 114 districts, reducing the populations needing interventions for LF, schistosomiasis and STHs, improved case management for Buruli ulcer and Leprosy, HAT control, awareness creation for NTDs, provision of guideline and direction for researchers, programme managers and other stakeholders to design country specific solutions. Following a review of the 2016 - 2020 master plan, through questionnaire assessment by various stakeholders, it is generally considered that the activities of the NTD programme are likely to be sustained.

Despite the achievements of the NTD programme several challenges were also identified during the review of the 2016 – 2020 master plan. These challenges have the potential to affect its sustainability. Notable among them are inadequate funding, inadequate integration and collaboration with other stakeholders, inadequate human capacity, limited implementation/operational research, and suboptimal use of NTD data. Whiles developing a master plan has streamlined and given focus to the programme management and its partners, the programme manages different partners with different focus. As such, designing appropriate programme management structures will improve collaboration between stakeholders. Integration of activities between the PC and CM NTDs, as well as into the general services provisions at health facilities and communities, will reinforce the activities, M&E and surveillance efforts of the programme. The significant changes identified to address the needs of the programme and its beneficiaries include: advocacy and funding, increasing staff needs and expertise, focus on community ownership of activities and expansion of CDDs activities to include behaviour change communication, operational research to address existing challenges, collaboration with other sectors such as WASH, M&E plans with emphasis on process indicators in addition to input and outcome indicators (process indicators will ensure that interventions are well implemented).

Strategic Direction

The strategic direction of the NTD programme is based on the five pillars of the Ghana health sector - financial and geographical accessibility, quality of care, efficiency, partnership, and equitable distribution of resources. In addition, it includes covering all the strategic elements (which are preventive, curative and rehabilitative/corrective) for the control and elimination of the target diseases. It seeks to integrate in all activities to achieve higher population coverage and significant prevalence reduction than through the single-disease approach. This reduces cost per person treated and burden on human resources. It further lays the foundation for a sustainable model and mobilize more resources and generate more demand for the services.

Objectives

The objectives, outputs and activities for this strategic plan are derived from the results of a situational and SWOT analysis. The expected outputs for the objectives are described and have been well harmonized with activities to achieve these outputs. The plan has been put in a Logical Framework Approach. The objective of this document is to present a clear vision and 5-year strategic plan for the integrated prevention, control, elimination or even eradication of the Preventive Chemotherapy diseases and the Case Management diseases under the NTD programme.

Programme Activities

Planning for the NTD programme will be held at all levels of programme delivery. To ensure effective ownership and active participation by community members for the control of NTDs, effective social mobilization will be carried out through sensitization and mobilization of the community members for the programme.

Training of health workers, teachers, environmental health officers and community-based volunteers will be done at regional, district and community levels jointly for all the diseases. Similar strategies for health promotion activities using mass media, print and interpersonal communication will be used to reach out to endemic communities. Two rounds of joint mass drug administration will be conducted to reach all endemic communities in the country from 2021 to 2025. During the first round of treatment Ivermectin and Albendazole will be given to cover LF, Onchocerciasis and STH. The second round of treatment will be given 6 months after the first round to cover Onchocerciasis, STH and SCH with ivermectin, mebendazole/albendazole and praziquantel, respectively.

Case search and management will be done all year round by trained health workers and volunteers. Rehabilitation and corrective surgery for the NTDP will involve the provision of surgery for patients who will need it and different forms of treatment provided for cases identified.

Joint or coordinated monitoring and evaluation of the entire programme will be done at all levels. Relevant surveys will be carried out for specific diseases.

Advocacy meetings will be held at all levels to increase awareness of NTDs and improve local sustainability. Continuous advocacy will be made for partners to continue to provide water sanitation and hygiene (WASH) facilities in all the endemic communities.

Section 1.2. National Context Analysis

This section contains two parts: country and health system analysis

1.2.1 Country Analysis

Location and Borders

Ghana lies on the West Coast of Africa between Latitudes 5º and 11º North of the Equator and between longitudes 1º East and 3º West of the zero meridian. It is bordered by the Gulf of Guinea in the South, Togo in the East, Cote d'Ivoire in the West and Burkina Faso in the North. The country has an area of 238,537 sq km with 550 kilometres of coastline.

Ghana has typical tropical climate with temperatures between 21 and 32 degrees Celsius. There are three geographic zones: dry northern savanna, the humid middle forest rainfall zone and the coastal savannah and mangroves. There are six major rivers with several tributaries some of which are fast flowing. One of the rivers, River Volta has been dammed covering 3% of the country. Yaws and Buruli Ulcer are prevalent in the humid forest zone while the rivers and lakes predispose to Onchocerciasis along the fast-flowing tributaries and Schistosomiasis in the areas with more stagnant waters. The coastal and dry northern zones are found to be more prevalent with Lymphatic Filariasis.

Administrative Structure

Until 2019, Ghana had 10 administrative regions and 216 districts. The creation of additional regions and districts resulted into 6 new regions and 34 new districts. For the purpose of this master plan, reference (especially with regard to NTD data) will be made to the original regions.

Each region is headed by a political administrator (Regional Minister) while the districts are headed by District Chief Executives. All districts have been subdivided into sub-districts with each covering a defined geographic area of 20,000-30,000 people. The implementation unit of health programmes is the district, sub-district or community levels.

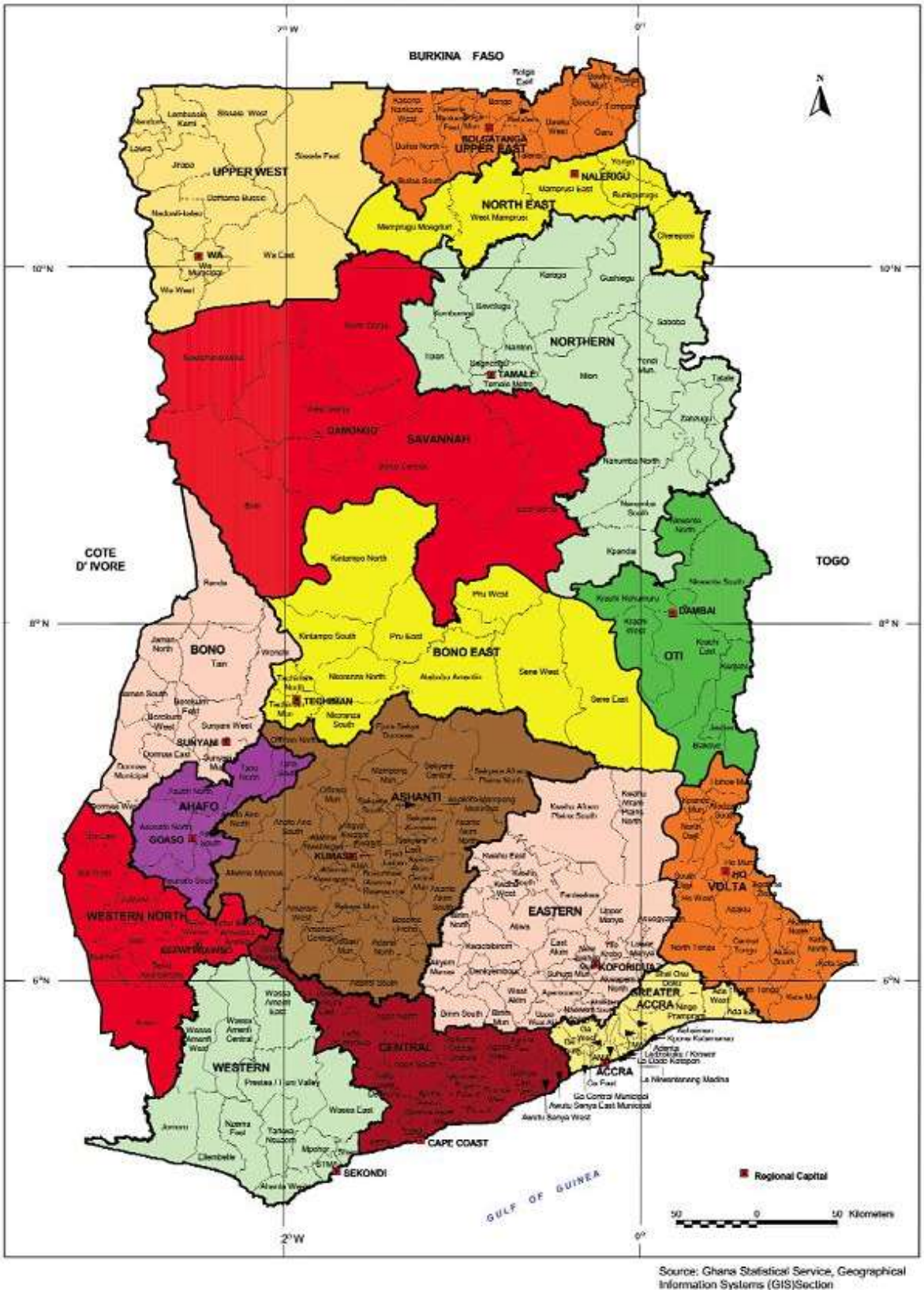

Figure 1: Administrative map of Ghana

Ghana's population is estimated to be about 31 million (49.2% males and 50.8% females) in 2020 (Source: Ghana Statistical Service). The population growth rate is 2.2 percent. Children under 5 years of age make up approximately 12% of the population, while children between 5 and 15 years (school-aged) constitute 25% of the population.

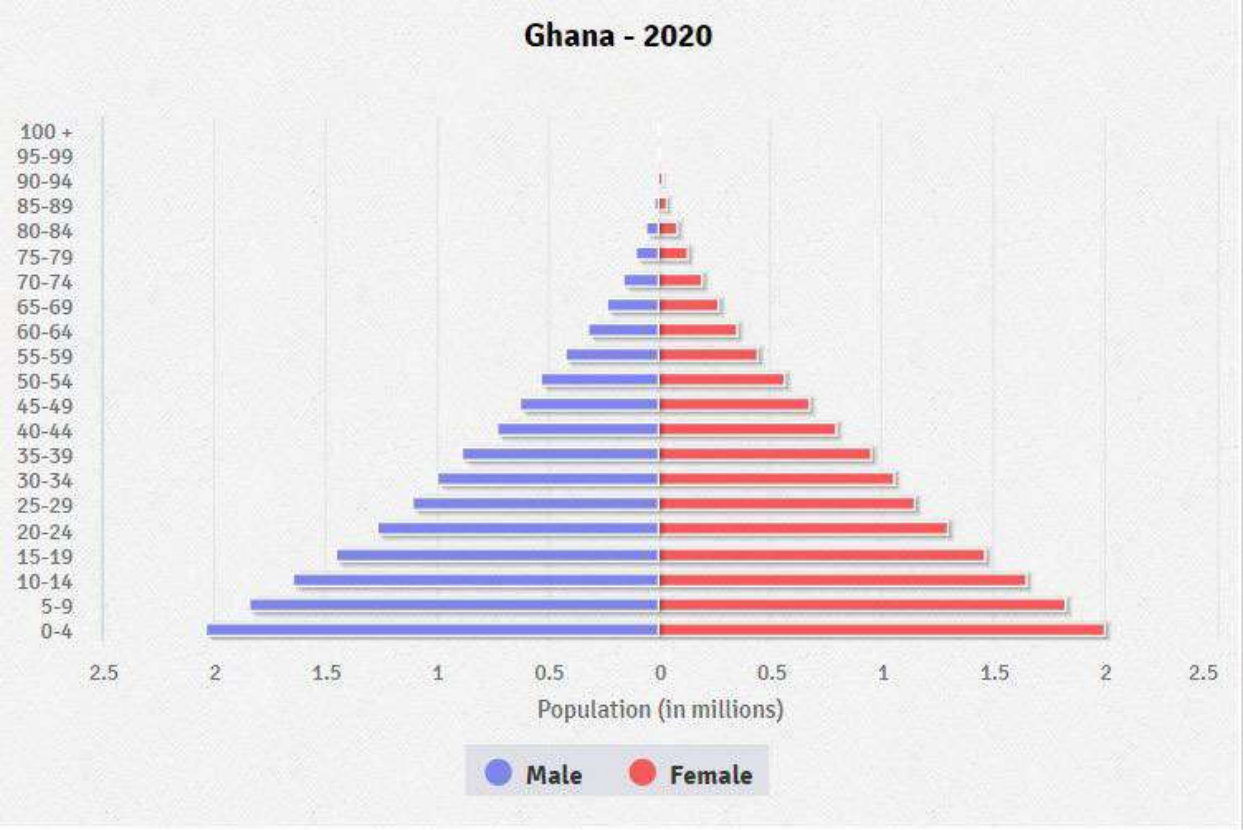

Figure 2: Ghana Population Pyramid by Age and Sex

About 43% of the population live in rural areas and are mainly engaged in agriculture and fishing. Infant mortality rate in 2019 is estimated at 34 per 1000 live births. The under 5 mortality is estimated at 46 per 1000 live births[3].

Table 1: National population data, schools, and health facilities at district level

Region	**Districts**	**Number IUs**	**Total population**	**Under- 5 (Pre-school)**	**5–14 years (School age)**	**No. primary schools**	**No. of peripheral health facilities (IU level)**
Ashanti	43	43	5,792,187	695,062	1,448,047	12477	510
Ahafo	6	6	599,852	71,982	149,963	7196	270
Bono	12	12	1,082,520	129,902	270,630		
Bono East	11	11	1,168,235	140,188	292,059		
Greater Accra	29	29	4,943,075	593,169	1,235,769	9156	320
Central	22	22	2,563,228	307,587	640,807	8778	223
Eastern	33	33	3,244,834	389,380	811,209	8080	523
Northern	16	16	1,905,628	228,675	476,407	6301	237
North East	6	6	575,558	69,067	143,890		
Savannah	7	7	581,368	69,764	145,342		
Upper East	15	15	1,273,677	152,841	318,419	2756	178
Upper West	11	11	849,123	101,895	212,281	1941	164
Volta	18	18	1,865,332	223,840	466,333	5970	356
Oti	8	8	742,664	89,120	185,666		
Western	14	14	2,165,241	259,829	541,310	7692	329
Western North	9	9	927,960	111,355	231,990		

Sources: Ghana: Administrative Division (Regions and Districts) - Population Statistics, Charts and Map (citypopulation.de) and Ghana Statistical service https://www.statsghana.gov.gh/

In Ghana communities are the smallest units of human settlements in any given area. The focus of most control activities of the Neglected Tropical Diseases Programme are the rural communities and urban slums where neglected tropical diseases most prevalent. These rural communities are in remote and hard to reach areas, where subsistence farming is the most common occupation. In these parts of the country, basic amenities are non-existent. Some of these farmers have seasonal farmsteads.

[3] Ghana Statistical service https://www.statsghana.gov.gh/

Rural communities have chiefs who rule the inhabitants of the community with a team of elders, a queen mother and other opinion leaders such as the assemblyman who represents the community at the district assembly. There may be other women and men's groups in these communities with their own leaders who represent these groups as opinion leaders in the communities. Religious groups with their leaders are also very important in rural and sub-rural settings. Their leaders are influential and influence greatly community issues. Other groups that may be found in these communities are occupational groups such as those for farmers, fishermen, different artisans.

Subsistence farming is the main occupation of most rural communities. The crops farmed are mainly cash crops in non-commercial quantities though many of them sell these at very cheap prices in order to raise some money for other household expenses. Their farming activities are rain dependent. The country has two main rainy seasons, the major one occurring between April and August and the minor one between October and November. Farming activities are therefore concentrated within these two major time periods.

Communities located along the coast and within some inland river basins also have fishing as their main occupation. Though fishing occurs all year round, bumper fish harvest of fish occurs during the major rainy season when the weather in most parts of the country is cold.

A few communities may have skilled workers or artisans who may be involved in carpentry, masonry, sewing among others. However, white-collar jobs tend to be completely absent in most rural communities. In others there is difficulty in finding an educated person to even help in undertaking community-based health activities that might require some basic skills in reading and writing.

Most rural communities depend on town criers, public address systems and meetings to facilitate communication and information sharing.

Rural communities in Ghana have existing community associations or groups which meet regularly and are represented in higher community level meetings involving opinion leaders. These social groupings include those for market women, men and women's social groups, ethnic groups where different ethnic groups are present, religious groups, and where present groups of skilled workers. In these communities every adult may be a member of at least one of these social or religious groups. The presence of these groups makes it possible to reach members of these communities especially the larger communities with health information and community-based health activities.

Some of the NTDs such as Onchocerciasis, Lymphatic Filariasis, Trachoma, schistosomiasis and soil transmitted helminths, require oral preventive chemotherapy at the community level. The method adopted for distribution takes advantage of the community structures available, making sure that community participation and leadership are key.

Some communities which will be involved in the implementation of these NTD programmes have some experience with the implementation of disease specific activities such as Community Directed Treatment with ivermectin (CDTi) in onchocerciasis which has been in existence since 1998.

Women either as groups or individuals have played a significant role in mobilizing communities for community-based health programmes such as distribution of medicines and bed nets as well record keeping. Early case detection requires the participation of the communities as in the case of Buruli Ulcer.

Socio-Economic Situation

Ghana is the second largest producer of Gold in Africa. It has other exports such as cocoa, oil, timber, electricity, diamond, bauxite, and manganese also being major sources of foreign

exchange. Also, horticultural products, handicraft, processed food and manufactured goods are produced. The non-traditional exports, are increasingly contributing to the Gross National Index (GNI), as well as tourism. An oilfield which is reported to contain up to 3 billion barrels (480,000,000 m^3) of light oil was discovered in 2007. Oil exploration is still ongoing though drilling and export of the first oil was carried out in 2011.

Ghana's labor force in 2019 was estimates at 69.2% of the total population. The services sector accounted for 48.5% of economy, with agriculture and industry accounting for 29.3 and 21.8% respectively[4].

Surface mining activities which leave scores of pits that serve as breeding sites for mosquitoes may predispose individuals to Lymphatic filariasis and Malaria. Dams and irrigational canals support dry season farming; however, they predispose farmers to schistosomiasis. The Human Development Index (HDI) for 2018 is 0.596 which gives Ghana a rank of 142 out of 189 countries and territories. Between 1990 and 2018, Ghana's HDI increased from 0.454 to 0.596, an increase of 31.1 percent[5].

Access to improved drinking water in Ghana is estimated at 89%; 93% urban coverage and 84% rural coverage[6]. Inadequate potable water supply and poor sanitation enable the continued transmission of STH and Trachoma, among other diseases[7].

Transport and Communication

Transport in Ghana is accomplished by road, rail, air and water. Ghana's transportation and communications networks are centered in the southern regions, especially the areas in which gold, cocoa, and timber are produced. Road transportation in Ghana constitutes about 97% of passenger and freight traffic in Ghana. Trunk roads in Ghana are classified as National roads, Regional roads, and Inter-regional roads, all of which form the Ghana road network. All districts are connected to their regional capitals by a network of roads most of which are tarred. The regional capitals are also linked through major road networks to the national capital; some areas, however, remain relatively isolated. Several intercity buses are available for commuters to different parts of the country. Transportation is especially difficult in the rural areas and in the vast, underdeveloped northern regions, where vehicles are scarce. In these areas motorcycles and bicycles are the main means of transportation.

There are four main mobile telephone companies namely, MTN, Airtel/Tigo, Vodafone and Glo. In 2012 there were 25.6 million mobile cellular lines. Telephone services are available and accessible in almost all parts of the country. Ghana was one of the first countries in Africa to connect to the Internet, with an average household download speed of 5.8 Mbit/s. In 2012 there were 62,124 fixed and 8.2 million wireless broadband subscriptions.

Ghana Broadcasting Corporation has nationwide coverage. There are many private radio stations with over 350 stations in the country. Many district capitals also have radio stations.

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[4] https://www.statista.com/statistics/447530/employment-by-economic-sector-in-ghana/

[5] Human Development Report 2019. Inequalities in Human Development in the 21st Century. Briefing note for countries on the 2019 Human Development Report. Ghana http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/GHA.pdf

[6] WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation 2015 Progress on Sanitation and Drinking Water – 2015 Update and MDG Assessment. WHO/UNICEF, Geneva and New York, USA.

[7] Campbell et al. Tailoring Water, Sanitation, and Hygiene (WASH) Targets for Soil-Transmitted Helminthiasis and Schistosomiasis Control. Trends Parasitol. 2018 Jan;34(1):53-63. doi: 10.1016/j.pt.2017.09.004

TV stations and services are about 128 in number with only the state-owned Ghana TV having national coverage.

There are several registered newspapers, some dailies, other weeklies, bi-weeklies, monthly and quarterly newspapers, most of them privately owned. Some are state owned and most of the others being private owned.

The existing communication system in the country can be relied on to a large extent for programme implementation and disease surveillance. The communication system can help communication with the programme's partners externally and also internally within the regions, districts and sub-districts most of which now have both mobile and fixed line telephone systems in place as well as internet accessibility. The challenge may however be fluctuation in network coverage and accessibility at some rural communities.

Public transportation cannot always be relied on for public health duties in most African countries including Ghana. Partners have supported health programmes by providing project vehicles and the Ghana Health Service has a pool of vehicles that is available for all health programmes. Competition for and pressure on these pool vehicles greatly reduces their availability to many programmes which therefore resort to acquiring their own vehicles to improve efficiency and cost-effectiveness.

1.2.2. Health Systems Analysis

Health system goals and priorities

Health System: Vision, Mission and Goal

The Ghana National Vision for Health is "A healthy population for national development".

The mission is to "work towards the achievement of healthy lives for all people living in Ghana through an enabling policy framework that recognizes, empowers and brings together, in a coordinated manner, all stakeholders."

The sector goal is to "promote, restore and maintain good health for all people living in Ghana". Ghana has over the years, established discrete programmes such as Malaria, TB, HIV/AIDS, NTDs, Reproductive Maternal, Newborn and Child Health, and NCDs. The challenge remains how to ensure that these programmes are fully integrated as a package and how to ensure their financial sustainability.

The Ghana Health Service ranks NTDs prevention, control and management third in the medium-term policies of the health sector.

The Process of Priority Setting

The revised National Health Policy (MoH, 2020)[8] focuses on ensuring healthy lives for all behavioural and lifestyle changes. The foreground to the new focus is premised on the fact that most of the burden of diseases are preventable and avoidable and can be curtailed by changing our lifestyles in terms of nutrition, physical activities and observing good hygiene practices. These among others have culminated in the introduction of regenerative health and nutrition interventions.

The Ghana Health Service as the forerunner in providing health services to all in the country will be at the forefront in this direction by emphasizing on addressing risk factors through impact– oriented health promotion, healthy lifestyle, and behavioural change activities. To attain the key indicators of the SDGs, the service throws enormous weight behind the High

[8] https://www.moh.gov.gh/wp-content/uploads/2020/07/NHP_12.07.2020.pdf-13072020-FINAL.pdf

Impact Rapid Delivery (HIRD) programme and further strengthen the capacity of the service to deliver efficient and effective services under the NHIS, work with donors and local assemblies in establishing more functional Community Health Planning Services (CHPS) zones and also address the seemingly insurmountable problem of erratic resources flow and inequitable distribution of health service resources.

Analysis of the overall health system

The Ghana Health Service (GHS) is the implementing agency of the Ministry of Health (MOH) responsible for health service delivery in the country. Health management in Ghana is decentralized. The Service comprises the Primary level at the district, the secondary level at the region and the tertiary referral level. District Health Management Team (DHMT) led by a District director of health services and reporting to the District Chief Executive (DCE) is responsible for district health service; the Regional Health Management Team (RHMT) led by a Regional Director of Health Services and reporting to the Regional Minister is responsible for the entire regional health service, and the National Headquarters and tertiary level where the Director General of GHS and Chief Executives of Tertiary Hospitals, reporting to the Minister of Health are responsible for the whole country. Complementing this arrangement are institutional/ health facility management teams. Each of these management levels is a budget and management centre (BMC) responsible for each team with definite operational budget.

Primary level (Primary Health Care-PHC) is delivered by the District Health System. It comprises all institutions (clinics, health centres and hospitals), whether private, public or traditional. The health centre is responsible for providing clinical, public health and maternity services to the catchment population. It uses a combination of facility-based services, regular outreaches and mass campaigns in close collaboration with communities, community institutions, leaders and Community based health workers. The district hospital serves as the first referral point in the primary health care system. They provide clinical (out-patient and in-patient), surgical, laboratory and maternity services.

At the secondary level, the regional hospital is the secondary referral point and offers specialized services. The teaching hospitals form the apex of specialized care in the country. The NTDs health intervention programmes have been integrated into the PHC in Ghana.

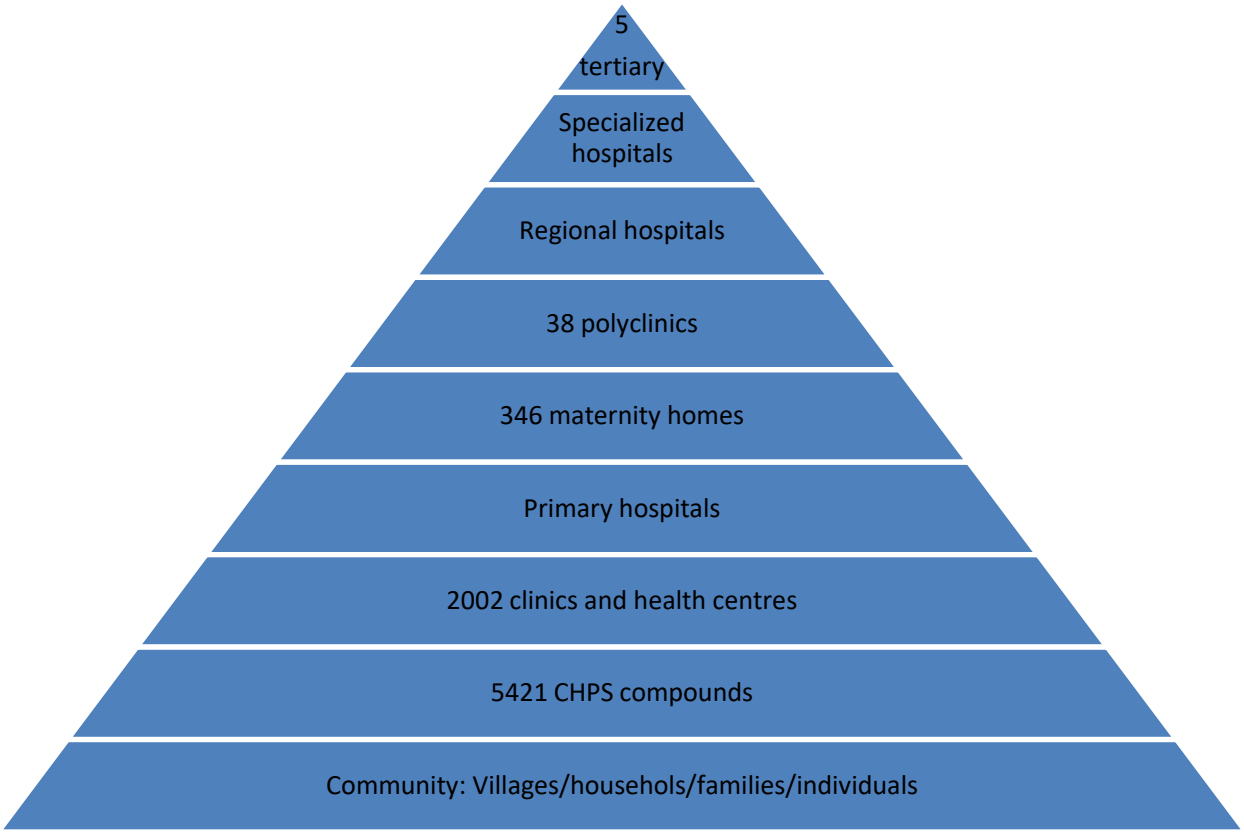

Figure 3: Levels of Service Delivery

Service Delivery

Even though indicators on specific programmes, such as EPI, TB control, malaria, HIV/AIDS and nutrition, show positive trends, the coverage of priority health interventions remains inadequate, leading to slow improvements in health outcomes. Weaknesses of the health system (staffing, funding, capacity etc) further impede the scaling up of proven cost- effective interventions. Most health centres do not provide a full complement of services and the rollout of CHPS which is a proven effective strategy to take health to the doorstep of the community has been extremely slow. Also, there is a need to review the services that are reserved for implementation at CHPS centres. As currently designed, they are not allowed to dispense antibiotics, which is very critical in the morbidity management of NTDs like LF. In addition, until recently very little attention has been given to risk reduction and the management of complications. Strengthening CHPS centres to provide diagnosis, treatment and case management for NTD patients will improve the service delivery role of the health system.

With the introduction of the National Health Insurance Scheme (NHIS), access to care has improved considerably, however, the health system is confronted with a lot of challenges such as inadequate infrastructure and equipment, data management, ICT, health care financing and quality of care. This notwithstanding, some health indicators have improved over the last decade as indicated below.

Table 2: Reduction in Infant Mortality in Ghana 2009 – 2019[9].

Indicator / years	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Infant mortality / 1000 lives	48.8	47	45.2	43.4	41.8	40.2	38.8	37.4	36.1	35	33.9

Health Workforce

Production of the human resource has not been matched with need; the number of health workers is inadequate. In 2017, the Doctor Patient ratio was 1: 7374 and the Nurse Patient ratio is 1:505.

Table 3: Type and number of health facilities in Ghana in 2017.

CHPS	Clinic	District Hospital	Health Centre	Hospital		Midwifery/ Maternity	Mines	Polyclinic	Psychiatry Hospital
5421	998	140	1004	357		346	11	38	3

The human resource planning process does not take into account the standard institutional requirements. This is compounded by GHS inability to define and attract resources to meet the standards and norms for each level of operation.

Chronic staffing imbalance due to attrition and inequitable distribution continue to plague the GHS despite various efforts and initiatives to retain and deploy staff to the rural areas. The situation is further compounded by an ageing workforce, which is negatively affecting the uptake of services. The introduction of NHIS has brought with it some challenges leading to increased workload and overreliance on casual staff. There also appears to be lack of coordination between population needs and the management of the human resources available leading to misplaced postings and transfers.

The current workforce number and distribution will need to be addressed in order to adequately control the NTDs. Moreover, the existing workforce will require additional capacity development and skills building to efficiently and effectively contribute to the control of NTDs. This is very crucial for the promotion of community-based care, especially morbidity management of chronic NTDs like LF and Leprosy among others.

There is health investment plan and policy on human resources that guides the recruitment and deployment of health staff.

The GHS has a mix of skilled health workers and professionals. As the close of 2019, GHS had employed over 90,000 critical staff accounting for over 70% of the total critical health sector workforce in the country. The cadre of health workers found in the districts and the peripheral health facilities include; doctors, midwives, nurses, pharmacists, dispensary technicians, biomedical scientists, x-ray, technicians, community health nurses, disease control officers, community health officers and health extension officers. Some areas are however affected by inadequate health workers and inequity in distribution exists.

There are also trained community-based volunteers for health. This includes community-based surveillance volunteers and community directed drug distributors. There are also traditional birth attendants who offer service at the community level.

[9] Ghana - infant mortality rate 2009-2019 | Statista

Health Information Management

The Centre for Health Information Management is a unit under the PPME division and is in charge of health information in the GHS. It receives data routinely from all health facilities (Government, Private, mission, quasi- government). The integrated disease surveillance and response (IDSR) is a strategy being used to record and report on major diseases in the country. IDSR now captures data on NTDs from the community through the sub-district to the district to the regional level and finally to the national level.

The introduction of District Health Information Management System (DHIMS) provides the GHS a standardized form to collect and collate essential data at the district level and this has brought a significant improvement in the quality of data collected. The CHPS strategy has shown a remarkable success in reducing maternal mortality rates, improving family planning acceptor rates, immunization and mass drug administration coverage in poor and underserved areas. With the CHPS concept fully deployed nationwide, as a strategy to bring health care closer to the communities, it can serve as the vehicle for implementing most integrated public health interventions that include preventive chemotherapy and case search for the neglected tropical diseases.

Although the reporting system has improved significantly in recent years within the service, there are still some challenges that need to be addressed. For instance, the use of data for defining district priorities, planning and resource allocation has been limited and this need to be improved upon. The gap between data collection and its usage at the local district level for decision-making must be improved. Inadequate information also hinders effective planning, monitoring and evaluation of health services. Poor data quality leads to inadequate utilization of information for policy decision-making. The efforts to improve communication and coordination within the GHS must continue for a maximum dividend. ICT development is progressing steadily, though at a slower pace than anticipated, especially at the district and facility levels.

Medical Products

The GHS procurement division, under the national procurement Act 265 of the 2001 will ensure due process in the procurement of medical products

There is a central medical store where all procured medical items are stored and later distributed to the regional medical stores. A few districts have storage facilities. Coordination, transportation logistics, timely distributions of commodities are some of the anticipated challenges that must be overcome.

Pharmaco-Vigilance

The Pharmacy department of the Institutional Care Division (ICD), GHS is responsible for the execution of Pharmacovigilance activities. The department collaborates with the Food and Drugs Authority (FDA) in the discharge of pharmacovigilance activities. For any serious adverse event the patient quickly reports based on the training offered to the community. Patient is seen by a health worker/ clinician who documents the reaction in the pharmaco-vigilance form and sends report through the district health management team (DHMT) to the Pharmaco-vigilance centre for further investigation. The NTD drugs being used in the country also undergo similar process.

Health Financing

The Government allocation to the health sector is still below the Abuja recommendation of 15%. In 2019, the health sector allocation in Ghana was 8.30%, this is far below the Abuja declaration of 15%. Even though the Abuja declaration is no longer valid, its principles are still relevant and the Government must strive to meet that target of 15%. The bulk of the government allocation is spent on health workers' salaries, infrastructure and biomedical. Other sources of funding for the health sector are Development Partners, International NGOs, and a few private sector organizations.

The GHS continues to suffer from inadequate budgetary provision and irregular flow or release of funds hampering planning and implementation of programmes. Decentralization of financial and personnel responsibility have lagged far behind managerial responsibility. Systems of financial management and audit are weak and other government regulations are often not complied with. The inability of districts to capture all available resources during their annual planning process, mainly attributed to continued existence of vertical funding of programs and initiatives is leading to duplications and inefficiencies.

Although annual budget plans on NTDs are submitted, it is not always funded. Sometimes when it is funded the funds are not released on time and sometimes not released at all. Persistent inequities in resource allocation, lack of rational criteria for allocating budgets and inefficiencies in resource management continue to remain major challenges within the service. There is no consensus on resource allocation criteria at all levels, leading to lack of transparency in disbursement of funds.

The NHIS coverage stood at 58.6% for women and men 41.4% in 2019 (NHIS, 2020) making health care financing for the individual and household mostly out of pocket.

Leadership and Governance

The Minister of Health is the political head of the ministry with two Deputies. The Chief Director is the Administrative head and has various directors heading the divisions. The ministry of health is responsible for policy formulation, coordination, monitoring and resource mobilization.

The Director General is the Head of the Ghana Health Service which is the implementation arm of the ministry of health. Since the establishment of the GHS in 1995 as a health reform strategy, a number of weaknesses have emerged. Existing institutional arrangements do not promote efficiency and are further exacerbated by overlap of functions between the MOH and GHS. The inherent weaknesses in GHS organization and its management structures to deliver on its mandate persist, which continue to weaken the efficiency of the health system.

The currently NTD policy elapsed by December 2020 and the current poly will provide institutional framework for NTD control to inform the next medium-term policies and priorities of the health sector strategic plan.

Also, there are individual coordinating bodies for specific programmes while the national coordinating body or steering committee called the NTD Intra Country Coordinating Committee (ICCC) for Ghana has been inaugurated and members presented to the Minister of Health. The organogram below shows the position of NTD programme in the health sector.

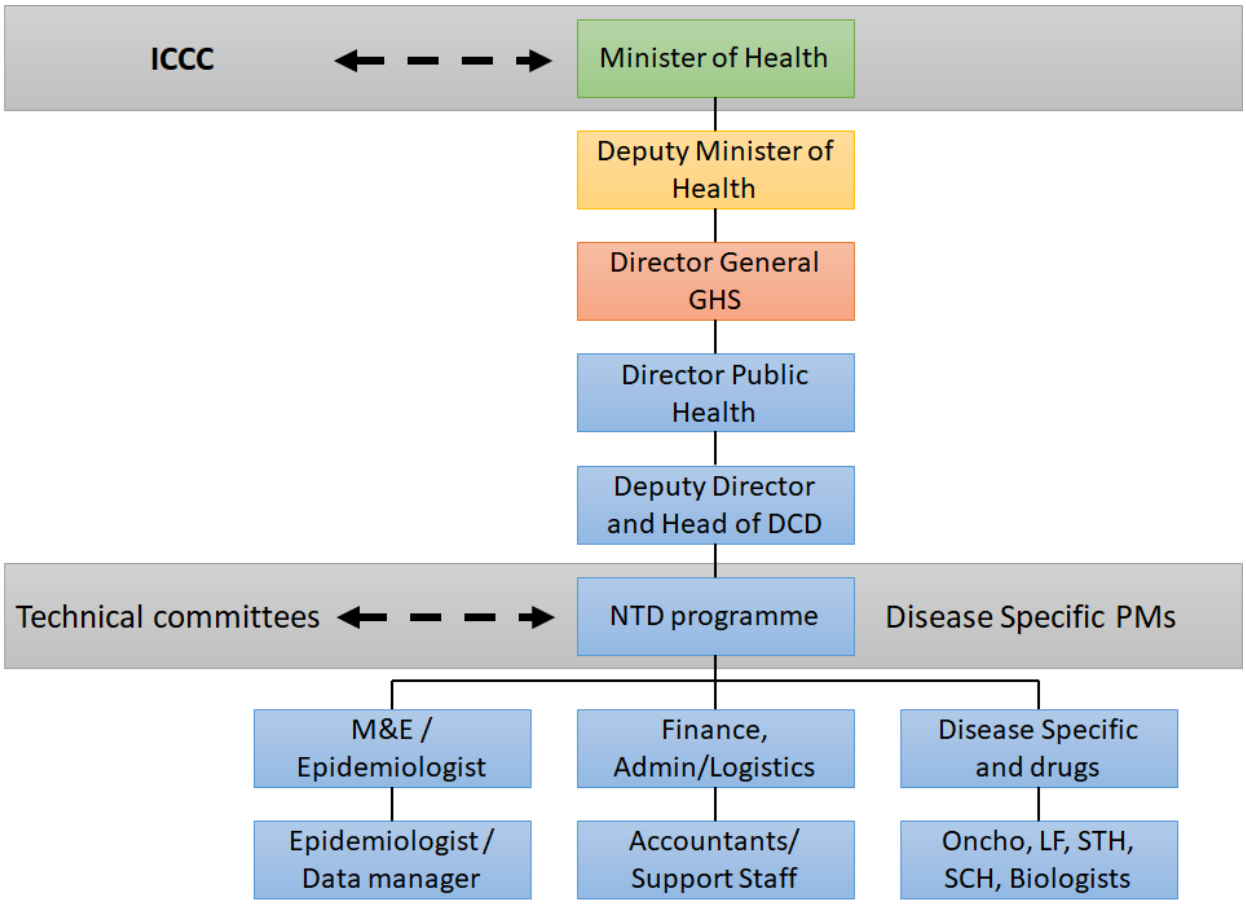

Figure 4: Organization of NTDP

Inter-Sectoral Collaboration

The GHS collaborates with the Ministry of Local Government & Rural Development (MLGRD), Ministry of Education (MOE), Ministry of Food & Agriculture (MoFA), Ministry of Sanitation and Water Resources (MSWR) , Ministry of Finance & Economic Planning (MoFEP), to implement most of its activities to ensure higher coverages. Some of these activities include MDA, control of Schistosomiasis and soil-transmitted helminthiasis through the deworming of school-aged children, National Immunization Days (NIDs), provision of potable water and sanitation facilities.

However, the public and private sector continue to operate separately with little linkages between them. The result is that services are implemented vertically without maximizing the strength of each other. Non-Governmental Organization (NGOs) and Civil Society Organization (CSOs) play a little role in planning and evaluating health services. In recent times, the NTD programme has been collaborating with a number of private sector organisations including NGOs, Civil society organizations and faith-based organizations to implement some of its control and elimination activities. However, it is yet to take full advantage of the vast opportunities that exist for collaboration and working together.

An Intra Country Coordinating Committee (ICCC) was established by the MOH to advise and coordinate activities for NTD control in Ghana. This committee liaises between the NTD programme and the Minister of Health, advising on the best approaches to achieve NTD

targets in Ghana. The ICCC brings together stakeholders from the health sector from the NTDs programme, maternal and nutrition programme, policy planning etc, education, water and sanitation, agric sectors, WHO, research and academia to discuss general policy direction to guide the MoH on NTD achievement and NTD intervention objectives. It discusses advocacy for NTDs, resource mobilization and sustainable funding.

Section 1.3. Gap Assessment

Key Health System Strengthening Gaps

The analysis summarized in the table 4 below is based on the findings of an NTD sustainability assessment and shows the main capacity gaps under each building block. This analysis will be helpful to identify key activities to address the gaps mentioned below.

Table 4: Health system strengthening gaps

HSS building block	Main gaps identified
Health governance & leadership	• NTD policy still to be developed. • Inter-sectoral collaborations in place but no indicators to monitor these collaborations.
Health financing	• Insufficient domestic resources allocated to NTD. • No specific budget line for NTD (at national and sub-national levels). • Budget forecasting exists only for external resources.
Service delivery	• Country adapted procedures and guidelines have not been developed. WHO guidelines are in use. • Government does not print IEC materials, as no funding exists. • There is little or no coordination with the WASH sector.
Human resources for health	• Human resources (HR) priorities are not identified as part of SOPs or HR policy and are not in accordance with programmatic needs. • Distribution of HR for NTDs is determined centrally and inappropriately deployed across the system. • Job descriptions of human resources involved in NTDs are not always available • Not all training modules are updated and/or available. A training database to track and allocate training according to need is not available.
Health information systems	• No M&E plan for NTDs. Data collection is not standardised. Trainings are needed for health workers in order to facilitate reporting of NTD data at all levels of the health system.

Section 1.4. Programme Context Analysis

1.4.1. Current NTD Programme Organization and Status

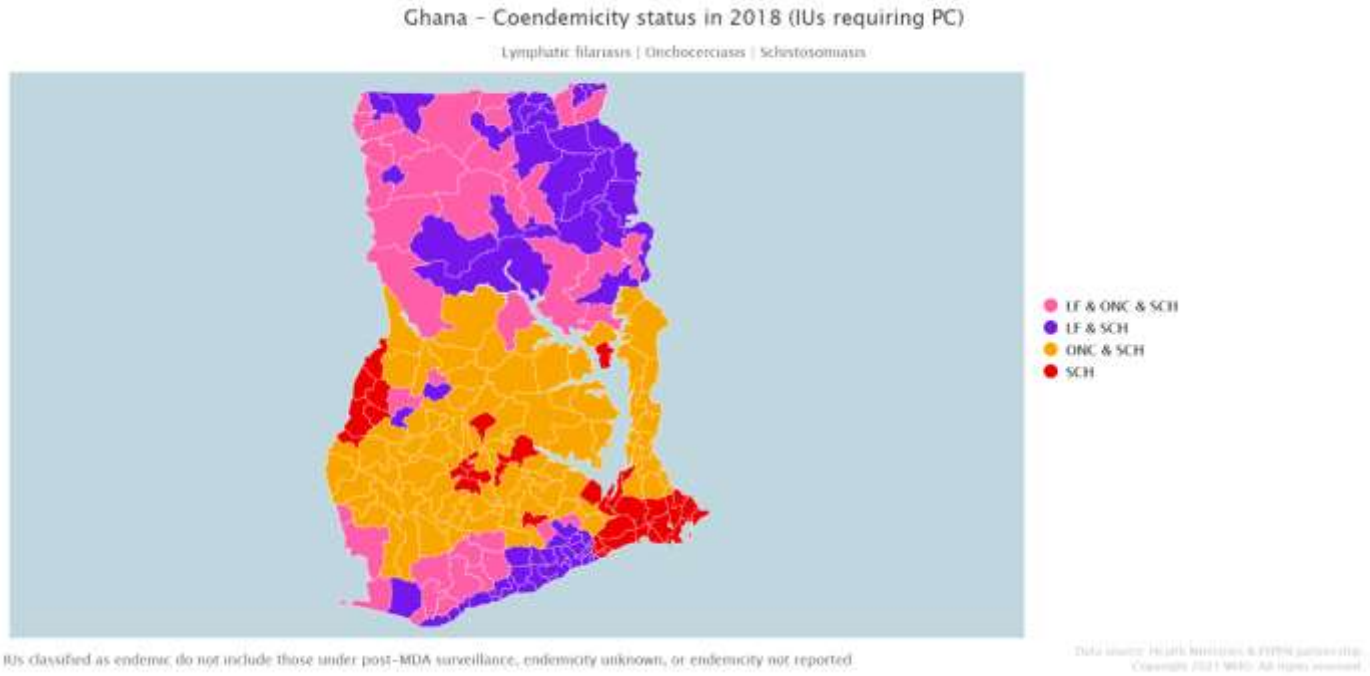

Figure 5: Co-endemicity map for lymphatic filariasis, onchocerciasis, and schistosomiasis. Source: Ghana | ESPEN (who.int)

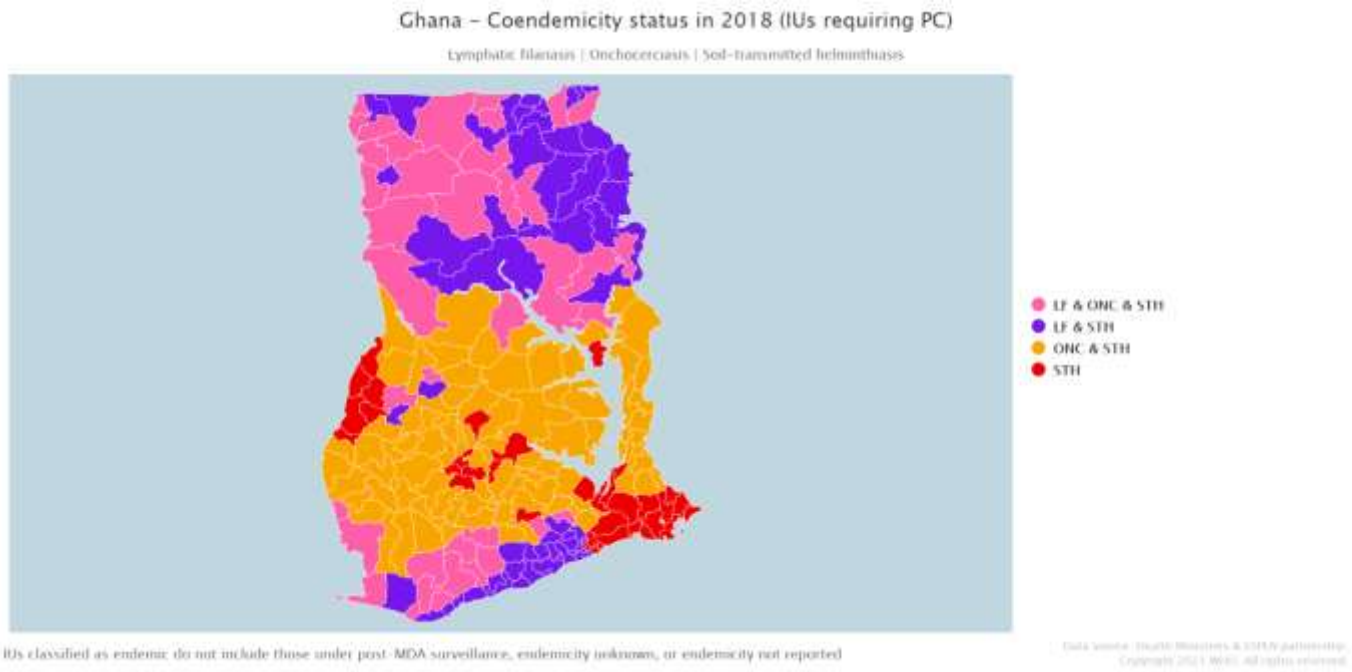

Figure 6: Co-endemicity map for lymphatic filariasis, onchocerciasis, and soil transmitted helminths.

Source: Ghana | ESPEN (who.int)

Trachoma

Surveys in the early 1950s in Northern Ghana identified trachoma as the most prevalent cause of blindness nationally. Later reports, in the 1990s, highlighted trachoma as a problem in the then Northern and Upper West Regions of the country. In December 1998, the Ministry of Health of Ghana, World Health Organization (WHO) and Non-Governmental Development Organisations collaborated in an effort to assess the trachoma situation in the two-suspected trachoma-endemic regions. They ranked affected villages to prioritize trachoma control interventions, using a modified version of the WHO Trachoma Rapid Assessment methodology in all districts in the then Northern Region and five districts in the Upper West Region. The results showed that approximately 70% of the 122 villages assessed in those regions would need interventions using the WHO-endorsed "SAFE" strategy for the elimination of trachoma.

In 1999-2000, baseline epidemiological trachoma prevalence surveys were conducted, starting with five districts. All five districts (Tolon-Kumbungu, Savelugu-Nanton and Tamale in the then Northern Region, and Wa and Sissala in the Upper West Region) had trachoma of public health significance needing SAFE interventions.

In total, taking into consideration the results of all surveys conducted over the lifespan of the Ghana Trachoma Control Programme, about 2.8 million people were estimated to be at risk of trachomatous blindness in Ghana, with an estimated 13,000 people suffering from trichiasis.

The International Trachoma Initiative selected Ghana, alongside five other countries, as a first-round recipient of Pfizer-donated azithromycin (Zithromax®) for trachoma elimination purposes. The Ghana National Trachoma Control Programme was initiated in June 2000 by

the Ghana Health Service / Ministry of Health, together with various international partners. The SAFE strategy using azithromycin was started in all known endemic communities of the five surveyed districts by 2001. By 2003, the programme had conducted baseline surveys in the remaining 13 districts in the then Northern and Upper West regions; data indicate that trachoma is not a public health problem in the remaining regions of Ghana. All endemic communities (communities with a prevalence of the active trachoma sign trachomatous inflammation—follicular (TF) ≥5% in children aged 1-9 years) in the 18 endemic districts had started receiving interventions with the various components of the SAFE strategy by 2004.

The programme also developed national strategic plans to guide implementation, starting with the first 2-year plan for implementation of the SAFE strategy in 2000, followed by a second strategic plan (covering 2003-2007) in 2003. In 2005, following publication of guidelines from WHO to conduct district-wide mass drug administration (MDA) in districts with TF prevalence ≥10% in children aged 1-9 years, a Five Year (2005 -2009) Strategic Plan for Trachoma Control in Ghana was developed and launched, with the goal of eliminating trachoma as a public health problem in Ghana.

Impact surveys were carried out in 2007-2008, revealing that the prevalence of TF had fallen to less than 5% in all districts in Northern and Upper West Regions. However, there were still TT cases to be managed to bring the TT prevalence below the elimination threshold. In 2009-2010, with support from WHO and other partners, a surveillance protocol was developed. This plan was implemented over a four-year period in all districts of the formally two endemic regions. Following the 2015 release of WHO guidelines for pre-validation surveillance, in 2015-2016, the programme conducted a series of population-based pre-validation surveillance surveys in districts of the two endemic regions. The results confirmed that the WHO criteria for elimination of trachoma as a public health problem had been achieved in all districts except the then Yendi district, which had reached the TF elimination threshold but had not yet attained the threshold for TT. In late 2016 and early 2017, an intensive TT case search and provision of surgery campaign was conducted in the then Yendi district. House-to-house TT case searches were undertaken in all communities of Yendi. Currently, therefore, there are no TT cases unknown to the health system in Yendi District. As a result, Ghana was officially validated by WHO as having eliminated trachoma as a disease of public health problem in 2018. However, the development and operationalization of the post elimination plan needs to be addressed.

The success of the Ghana programme was a result of the strong leadership at all levels, implementation of the full SAFE strategy right from the onset, strong collaboration between Ghana Health Service and its many programme partners, and integration at lower levels of programme delivery, including community ownership.

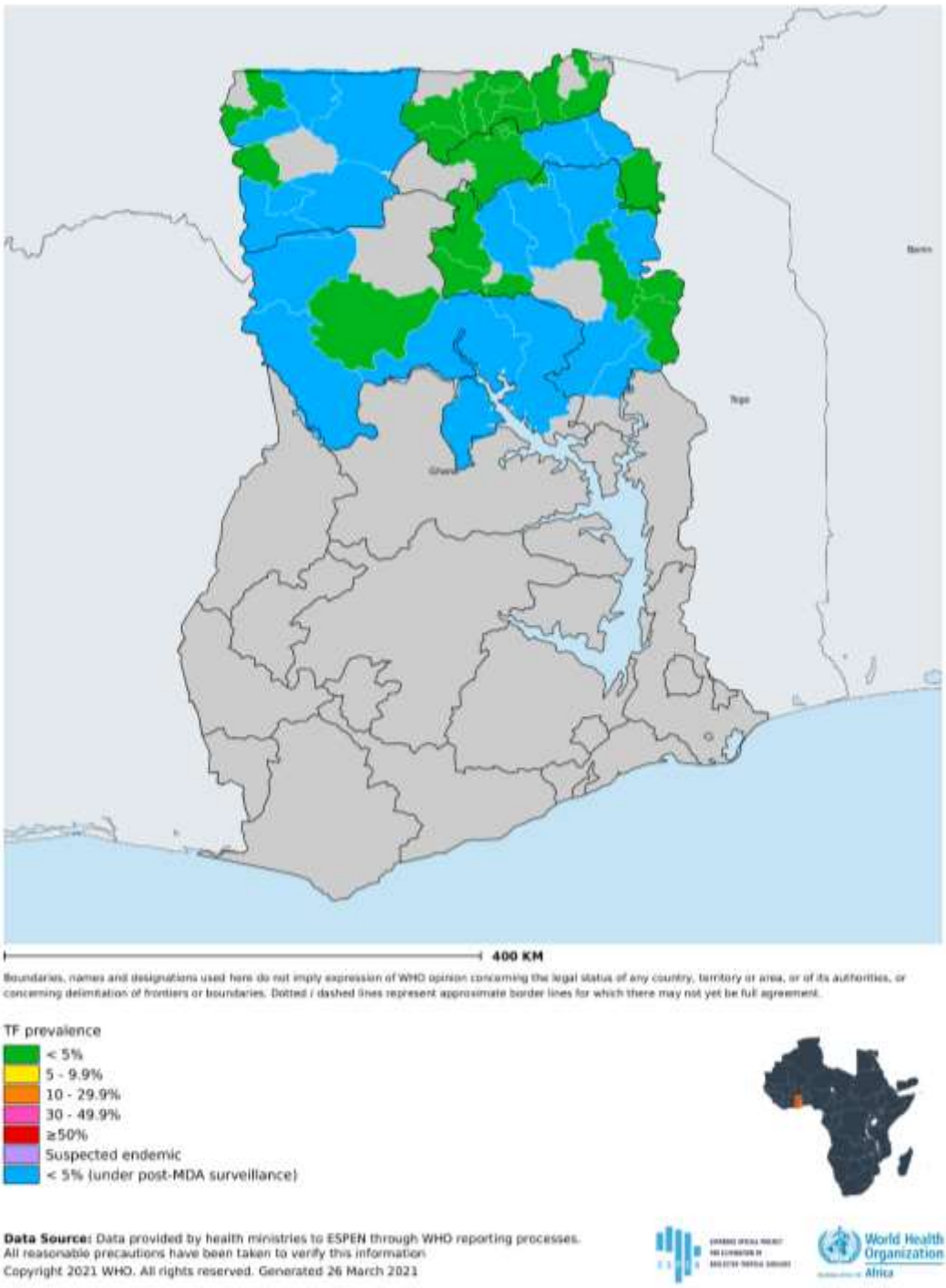

Figure 7: TF prevalence in Ghana (2019). Source: Ghana | ESPEN (who.int)

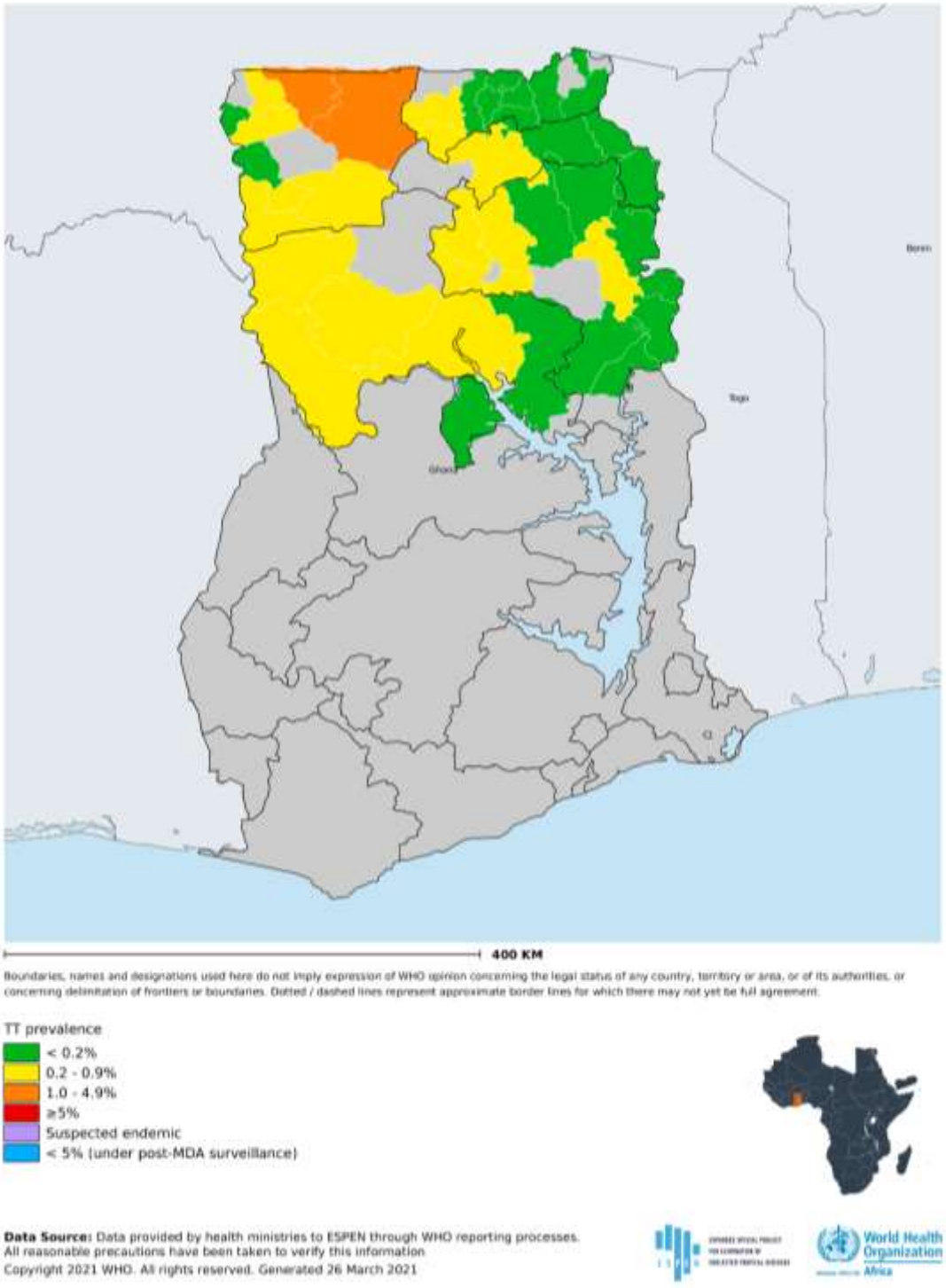

Figure 8: TT prevalence in Ghana (2019). Source: Ghana | ESPEN (who.int)

Lymphatic Filariasis

Lymphatic Filariasis, known as Elephantiasis is caused by a thread-like, parasitic filarial worm *Wuchereria bancrofti* in Ghana. These worms lodge in the lymphatic system, the network of nodes and vessels that maintain the delicate fluid balance between the tissues and blood and are an essential component for the body's immune defence system. The adult worm lives for 4-6 years, producing millions of immature microfilariae (minute larvae) that circulate in the blood. In its most obvious manifestations, lymphatic filariasis causes enlargement of the entire leg or arm, the genitals and breasts. In endemic communities, up to 35% of men have hydrocoeles and up to 4% of the adult population can be affected with lymphoedema. The psychological and social stigma associated with these aspects of the disease is immense. In addition, even more common than the overt abnormalities is hidden, internal damage to the kidneys and lymphatic system caused by the filariae.

Lymphatic Filariasis is endemic in 114 out of the 260 districts in 12 regions of Ghana. The disease was mapped in 1999 and the distribution of ivermectin and albendazole started in 2001. Currently 102 districts have met the criteria for stopping MDA and are no longer treating. At the start of the programme, the antigen prevalence was estimated to be between 20% to 40% in the north and 10% to 20% in the south. This has been drastically reduced to less than 8% in the remaining districts still requiring treatment. The prevalence of elephantiasis is between 0 – 4% with more females being affected than males. In 2015, the programme has registered about 2,497 cases of elephantiasis and 5,167 cases of hydrocoele in the country. These figures are updated annually as the programme pursues its up-scaling plan. The incidence of acute attacks is about 95.9 per thousand patients with lymphoedema per annum. About 90% of these attacks occur in people with existing lymphoedema with 3 days of total incapacitation with its resultant economic consequences. Occurrence of this condition is highest in the rainy season when most people are most productive on their farms.

The identified challenges to LF elimination in Ghana include; poor motivation of volunteers for MDAs, inadequate provision for morbidity management and disability prevention, persistent transmission in 15 districts (hotspots), challenges with MDA drug distribution, lack of cross-border collaboration among the endemic border districts, poor MDA data quality, lack of consistent monitoring, limited investment in vector control and social behaviour change communication and noncompliance to MDA.

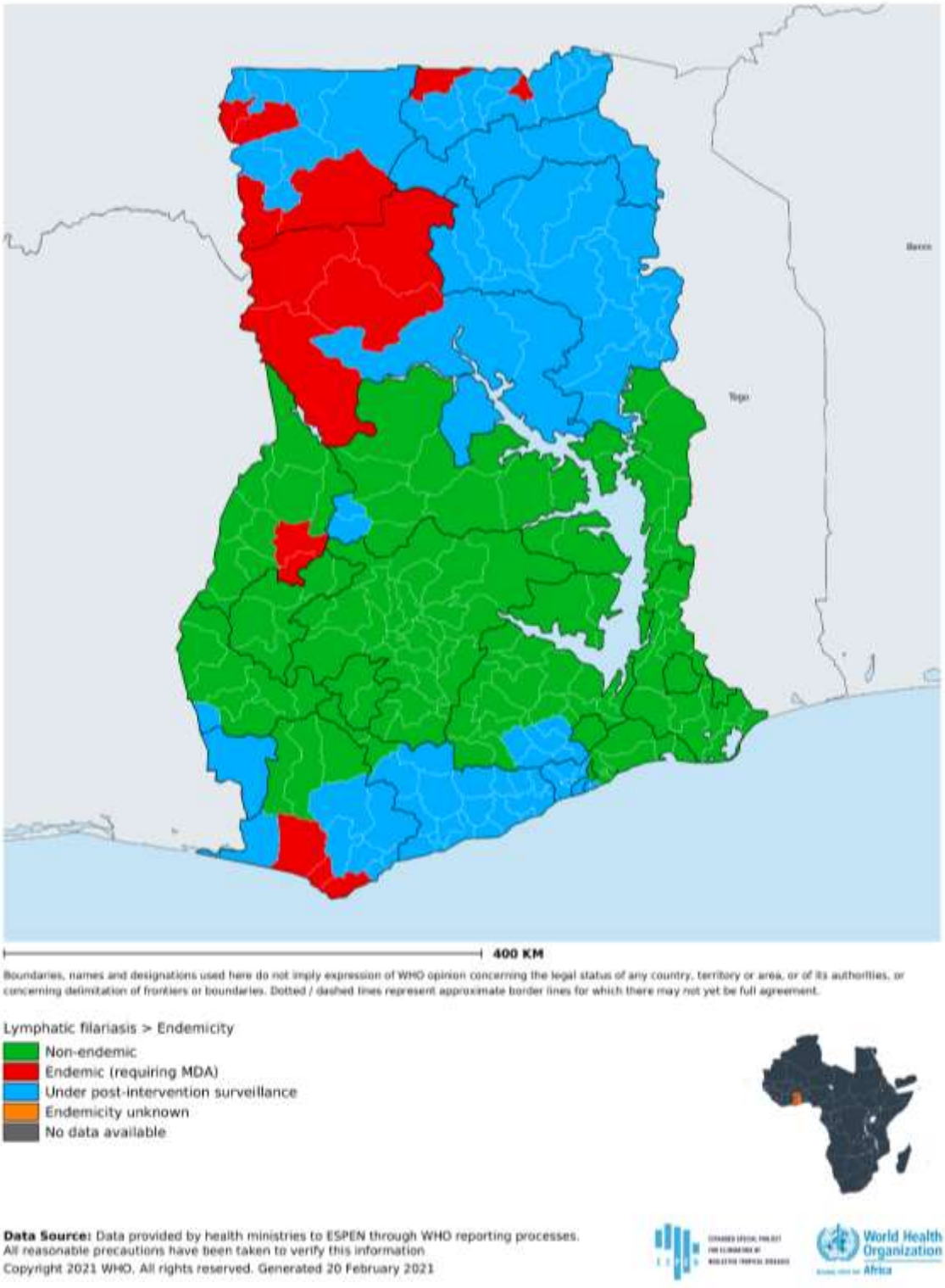

Figure 9: Status of LF elimination in Ghana (2019). Source: Ghana | ESPEN (who.int)

Onchocerciasis

Onchocerciasis is also caused by the filarial parasite *Onchocerca volvulus* which invades the subcutaneous tissues of the body. The most common symptoms are itching, atrophy of the skin, lizard skin or hypertrophic skin changes or areas of hypopigmentation known as leopard skin. Microfilaria invasion of the eyes lead to various eye lesions with the associated visual impairment. The end stage of onchocercal eye lesions is blindness which can occur as early as age 20.

Ghana is one of the countries at the forefront of Onchocerciasis control since 1974 when the WHO-led Onchocerciasis Control Programme that focused on blinding onchocerciasis and applied aerial larviciding commenced. Following the licensing of ivermectin in the late 1980s, its distribution through mobile teams was implemented (in conjunction with vector control) until 1998 when ivermectin distribution through the CDTi became the main stay. In 2008 a nationwide REMO exercise was conducted to provide updated information on the distribution of onchocerciasis. Thus, 44 districts were classified as hyper and meso-endemic and received biannual MDA since 2009. Forty-one districts which were classified as hypo-endemic and were already on MDA prior to the REMO continued to receive MDA annually.

The last five years have seen a dramatic change of strategy from control to elimination of onchocerciasis in Ghana. The `epidemiological threshold has thus changed from mf prevalence of 5% to 1% and the implementation unit has changed from community to sub-district with attendant increase in the registered and treated population and geographic coverage. This implies that the programme must position itself well to respond to the increase in human and financial resources required to achieve the elimination target. In 2017 an onchocerciasis impact assessment survey was carried out using OV16 serological test in children under 10 years while parasitological assessment (skin snip) was performed in adults 20 years and above. Together with historical data, the onchocerciasis impact assessment has provided the programme with information for use in formulating strategies towards elimination of onchocerciasis. Fifty hypo-endemic districts that have until now never received treatment for onchocerciasis have had epidemiological surveys followed by delineation and redefined treatment strategy and management decisions. Currently 137 districts will require biannual MDA.

Meeting the onchocerciasis elimination targets in Ghana will require; proper monitoring of MDA to ensure reported coverages are accurate ,conducting surveys and exclusion mapping in relevant areas in order to obtain a true picture of the endemic situation in Ghana, providing clear guidance towards elimination (the country's elimination committee is providing this guidance), ensuring adequate and effective supervision of MDA activities , improve data quality, vector control, the need for new field friendly and sensitive diagnostic tools which are acceptable in endemic communities, evidence on development of resistance to ivermectin in *O. volvulus* parasites. A comprehensive data management system to provide documentary evidence for verification of interruption of transmission of the *O. volvulus* and elimination of onchocerciasis in the future will be established to include data on target population, number of people treated, therapeutic and geographic coverage by community, sub-district, district and transmission zone.

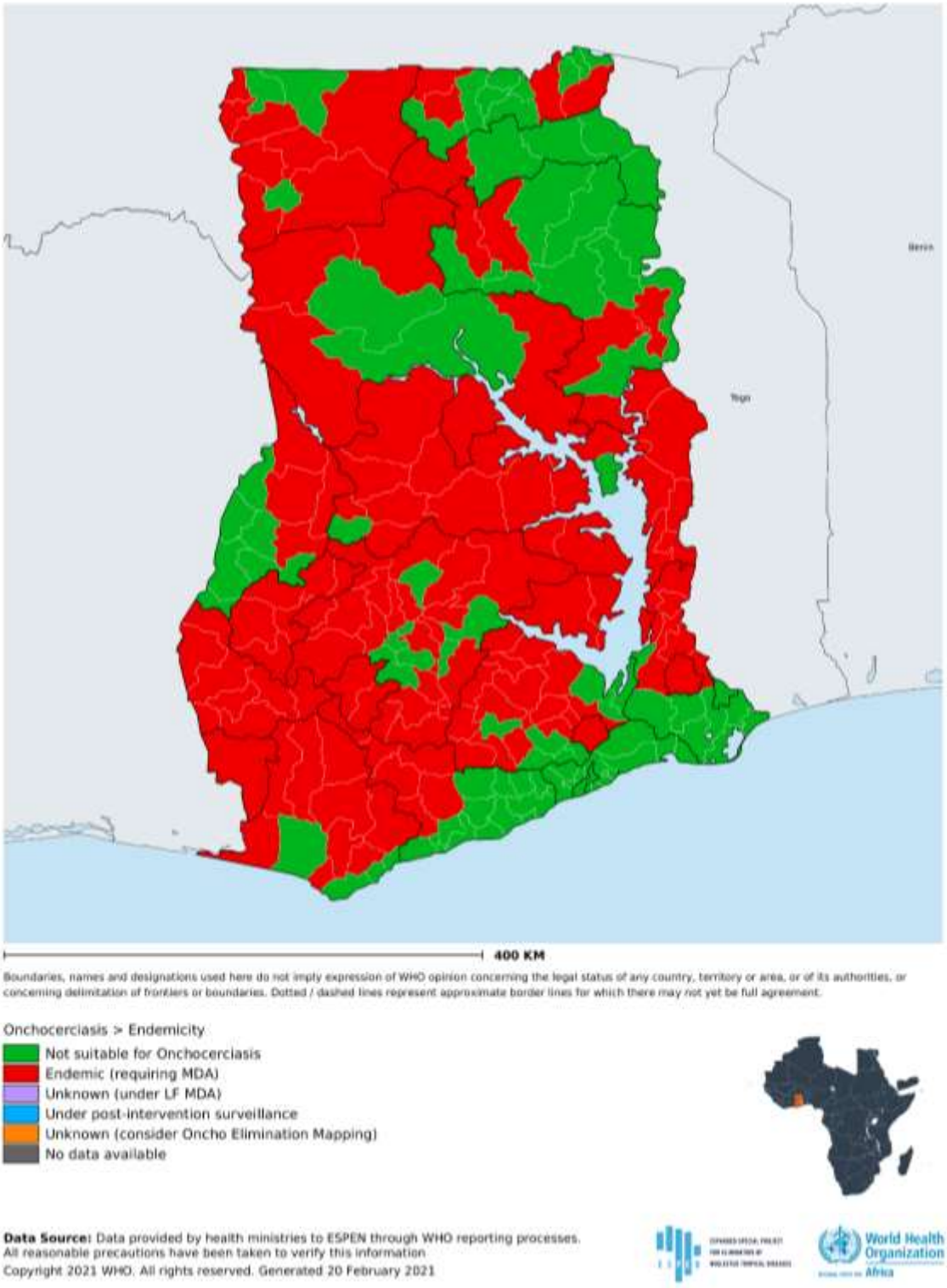

Figure 10: Status of onchocerciasis elimination in Ghana (2019). Source: Ghana | ESPEN (who.int)

Schistosomiasis

Urinary Schistosomiasis caused by a blood fluke *Schistosoma haematobium,* is very widespread in the country. The main symptoms include dysuria, frequency and terminal haematuria. Chronic infections may lead to cancer of the bladder in both males and females. Intestinal Schistosomiasis caused by *Schistosoma mansoni* is also prevalent in the country. Its symptoms include abdominal pains, bloody diarrhoea and enlargement of the liver and spleen. Chronic infections may cause thickening of the liver, portal hypertension and eventually death.

Available data which dates back to the 1970s indicated that Urinary Schistosomiasis was widespread countrywide. The same data showed that Intestinal Schistosomiasis was restricted and patchy in its distribution. The Volta basin recorded prevalences as high as 80-90% in many communities living along the lake. Similarly, the Volta estuary was endemic with infection rates of 76.2% for *S. mansoni* and 6.3% for *S. haematobium*. Generally, Schistosomiasis was found to be highly endemic within communities located along rivers in all 16 regions of Ghana.

Nationwide mapping of schistosomiasis was carried out in 2008. A total of 6,618,064 school-aged children were identified as being at risk. In 2008, 48 districts were classified as having high prevalence of ≥ 50,%, 137 districts as moderate prevalence 10% - 50,%, and 31 districts as low prevalence 0% – 10.%. Schistosomiasis is targeted for control. The main strategy is annual mass drug administration for the school-age and high-risk adults. The NTD programme started treatment 2008. Assessments in 2015 indicate that the number of high prevalence districts has been reduced to 3. The number of districts in the moderate and low prevalence categories are 54 and 159 respectively.

Female genital schistosomiasis (FGS) resulting from the ectopic location of the eggs and adult worm of the parasite in the female genital system leads to important consequences such as spontaneous abortions, infertility, postcoital bleeding, dypareunia vaginal discharge, pelvic pain, and genital itch. Studies in Ghana have shown that 10.6% of women with urinary schistosomiasis were diagnosed with FGS[10]. Lack of awareness of FGS and general misconceptions among women, girls and front-line health workers represent major challenges to control and the implementation of interventions, as schistosomiasis is generally considered a boy's disease and FGS linked to sexual promiscuity[11]. There is therefore an urgent need to better engage on FGS and implement interventions to meet the needs of girls and women.

Schistosomiasis control in Ghana faces many challenges. Among these are: inadequate provision for WASH facilities, need to refine the endemicity data for targeted treatment, poor data management and quality, absence of social behaviour change communication strategies, lack of collaboration with relevant community agents who could influence behaviour, poor treatment coverage, lack of implementation of other control strategies in addition to drug administration, lack of relevant operational research to direct programme activities, no vector control and provision of alternative livelihood especially for indigenes who rely on water sources as their main source of livelihood.

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[10] Yirenya-Tawiah et al. A survey of female genital schistosomiasis of the lower reproductive tract in the volta basin of Ghana. *Ghana Med J*. 2011;45(1):16-21. doi:10.4314/gmj.v45i1.68917

[11] Kukula et al. A major hurdle in the elimination of urogenital schistosomiasis revealed: Identifying key gaps in knowledge and understanding of female genital schistosomiasis within communities and local health workers. *PLoS Negl Trop Dis*. 2019 Mar 21;13(3):e0007207.

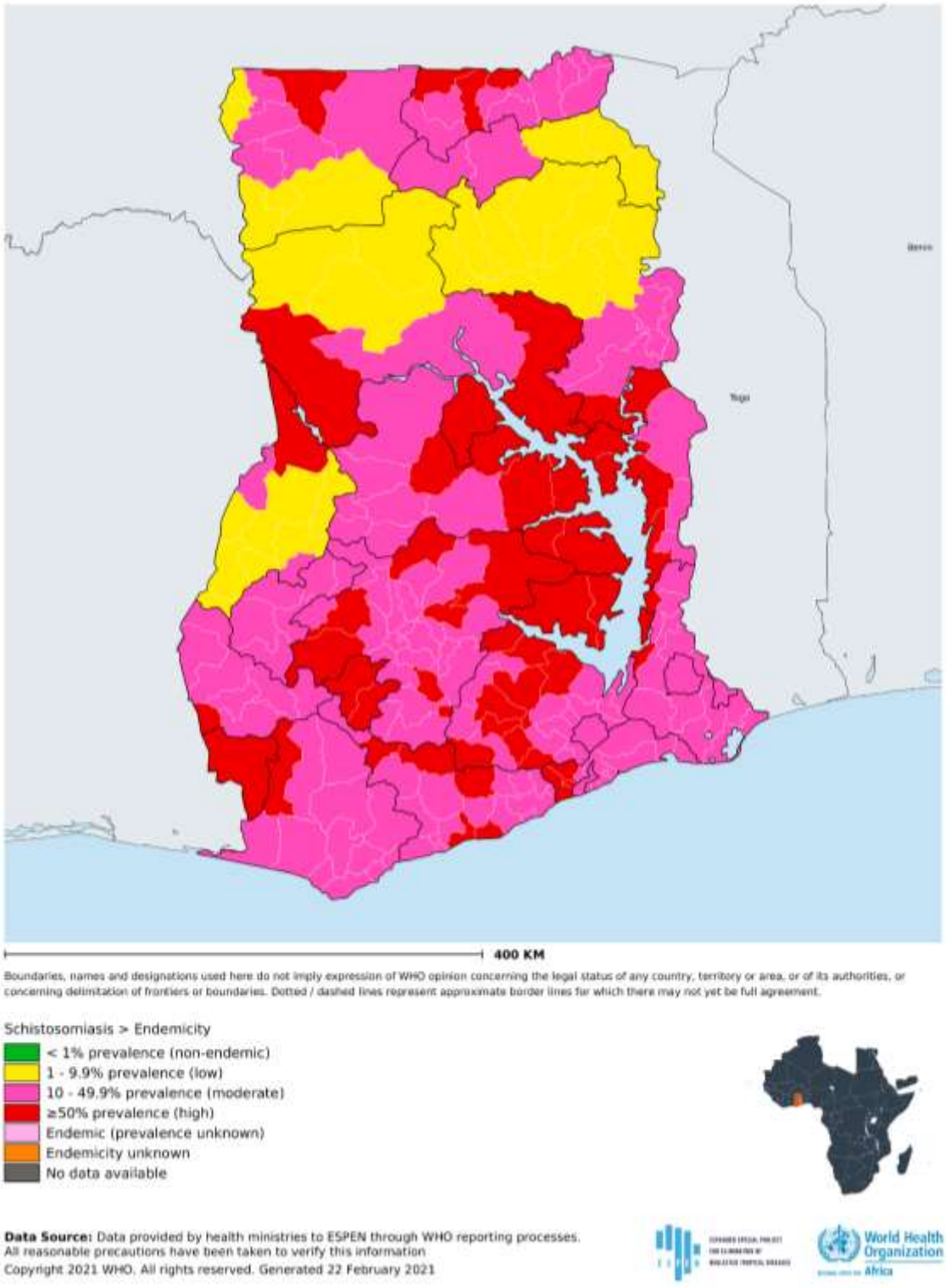

Figure 11: Status of schistosomiasis elimination in Ghana (2019). Source: Ghana | ESPEN (who.int)

Soil-Transmitted Helminths

The major Soil-transmitted Helminths (STH) in Ghana are *Ascaris lumbricoides, Trichuris trichuria, Necator americanus/Ancylostoma duodenale* and *Strongyloides stercoralis*. Soil transmitted Helminths causes malnutrition, anaemia, growth retardation, cognitive impairment as well as lowering of resistance to infections. Hookworm causes blood loss into the gut and this results in Iron deficiency anaemia and growth retardation. *Ascaris lumbricoides* can cause intestinal obstruction in children and other complications when adult worms migrate from the small intestine to other parts of the body.

The endemicity of STHs determined during the mapping exercise in 2008 showed low prevalence of STH in most of the districts in Ghana. 17 districts with an at-risk school-aged population of 357,203 have prevalence of between 0.2 – 0.3 and required annual treatment with albendazole or mebendazole. However, due to the high rate of recurrence of STH it is also recommended that every school aged child receives at least one dose of albendazole or mebendazole treatment annually. In 2015, the number of low prevalence districts was 5.

Challenges to STH control in Ghana include poor education and hygiene practices, inadequate provision for WASH facilities, poor data management and quality, absence of social behavior change communication strategies, lack of collaboration with relevant community agents who could influence behaviour, lack of related translation research pertaining to specific communities and improper structural design and use of the sanitation facilities where available.

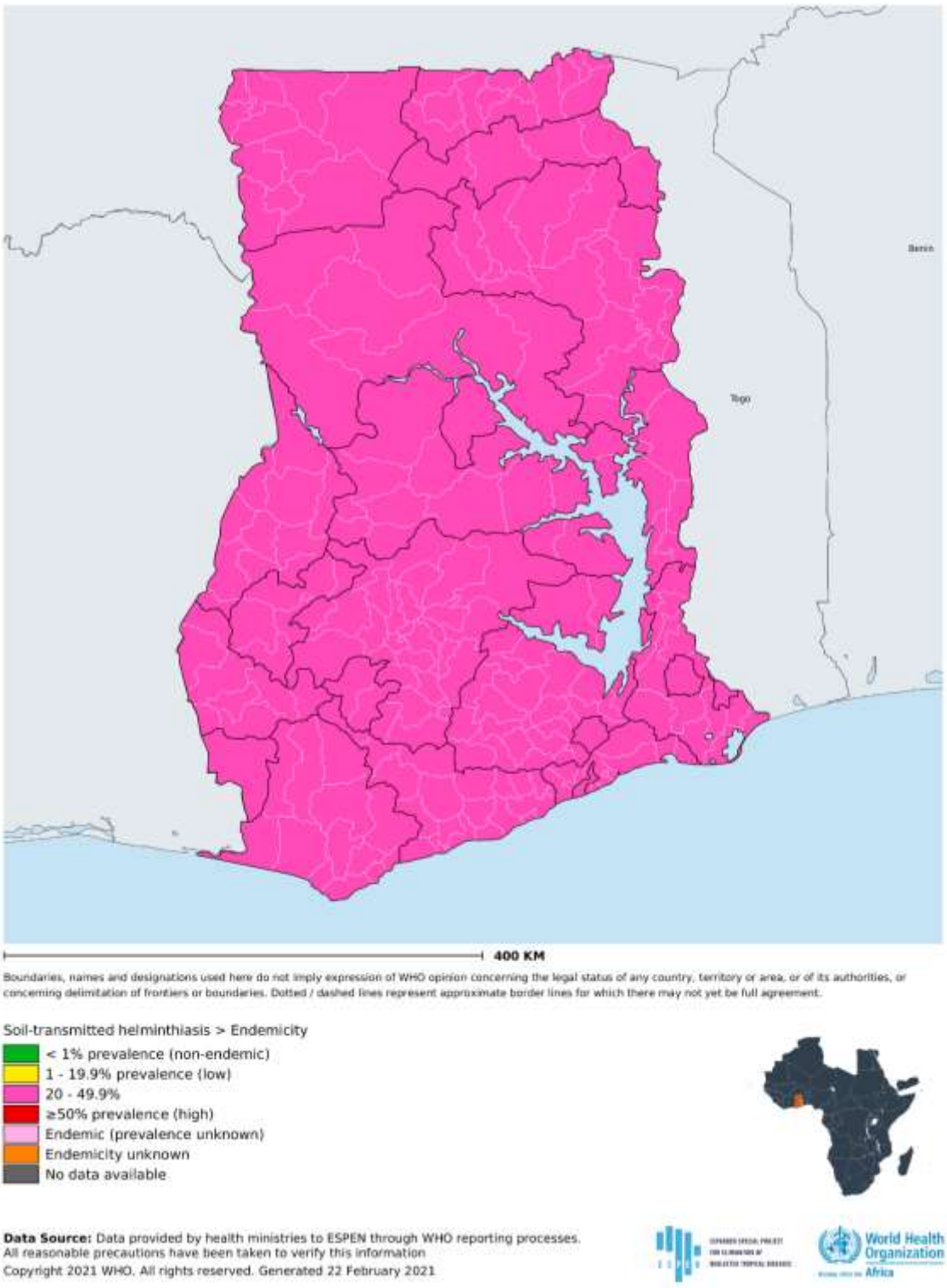

Figure 12: Status of STH elimination in Ghana (2019). Source: Ghana | ESPEN (who.int)

Yaws

Yaws is a treponemal infection associated with acute and chronic morbidity characterized by deformities due to scarring and destruction of bone and cartilage of the face, hands and long bones. It is transmitted by direct skin contact through breaches in the skin. Poor personal hygiene, overcrowding, poor water and sanitation in some rural communities is responsible for high prevalence of yaws. Despite global and repeated national efforts at elimination, the prevalence of yaws, based on clinical assessment, is estimated at 0.7% of the population of Ghana (National Yaws Elimination Program Annual Report, 2008). At the time of reporting, all districts in Ghana apart from 9 in Greater Accra Region report yaws cases but the most affected are rural and deprived communities in Eastern, Volta, Central, Ashanti, Brong Ahafo and Western Regions due to the high humid climate of these forest areas. Pilot studies in Eastern Region in 2008 recorded prevalence between 10 and 20% in some schools (NYEP Annual Report 2008). From annual routine reports children under 15 years constitute about 75% of cases with a small but consistent preponderance of males. Cases are reported all year round. More recent mapping information from 13 districts in 4 regions reveal that 64.2% of children were DPP positive, with 22.6% testing positive for *Treponema pallidum subsp pertenue* DNA[12]. Between 2013 and 2016, 23347 clinical yaws cases were reported from 134 districts in Ghana.

Ghana's policy to eliminate yaws is consistent with the WHO roadmap that targeted the eradication of yaws by 2020 [13], which was missed. The challenges to yaws eradication in Ghana include poor education, poor personal hygiene, inadequate logistics for diagnosing and tracking for mass drug treatment interventions and case management. The Ghana programme strategies to eliminate yaws are as follows:

1. Active and passive surveillance and treatment following the Morges strategy[14] (treatment of entire endemic community using single dose azithromycin, irrespective of the number of active clinical cases)
2. Promotion of personal and environmental hygiene practices
3. Advocacy for improved water supply
4. Cross border collaboration with other endemic West African neighbours

[12] Basing et al. Mapping of yaws endemicity in Ghana; Lessons to strengthen the planning and implementation of yaws eradication. 2020. medRxiv 2020.02.20.20025122; doi: https://doi.org/10.1101/2020.02.20.20025122

[13] Yaws: towards the WHO eradication target. Marks M. 2016. Trans R Soc Trop Med Hyg. 110(6):319–20.

[14] Summary report of the consultative meeting on eradication of yaws, 5–7 March 2012, Morges, Switzerland. Geneva: World Health Organization; 2012 http://apps.who.int/iris/bitstream/10665/75528/1/WHO_HTM_NTD_IDM_2012.2_eng.pdf

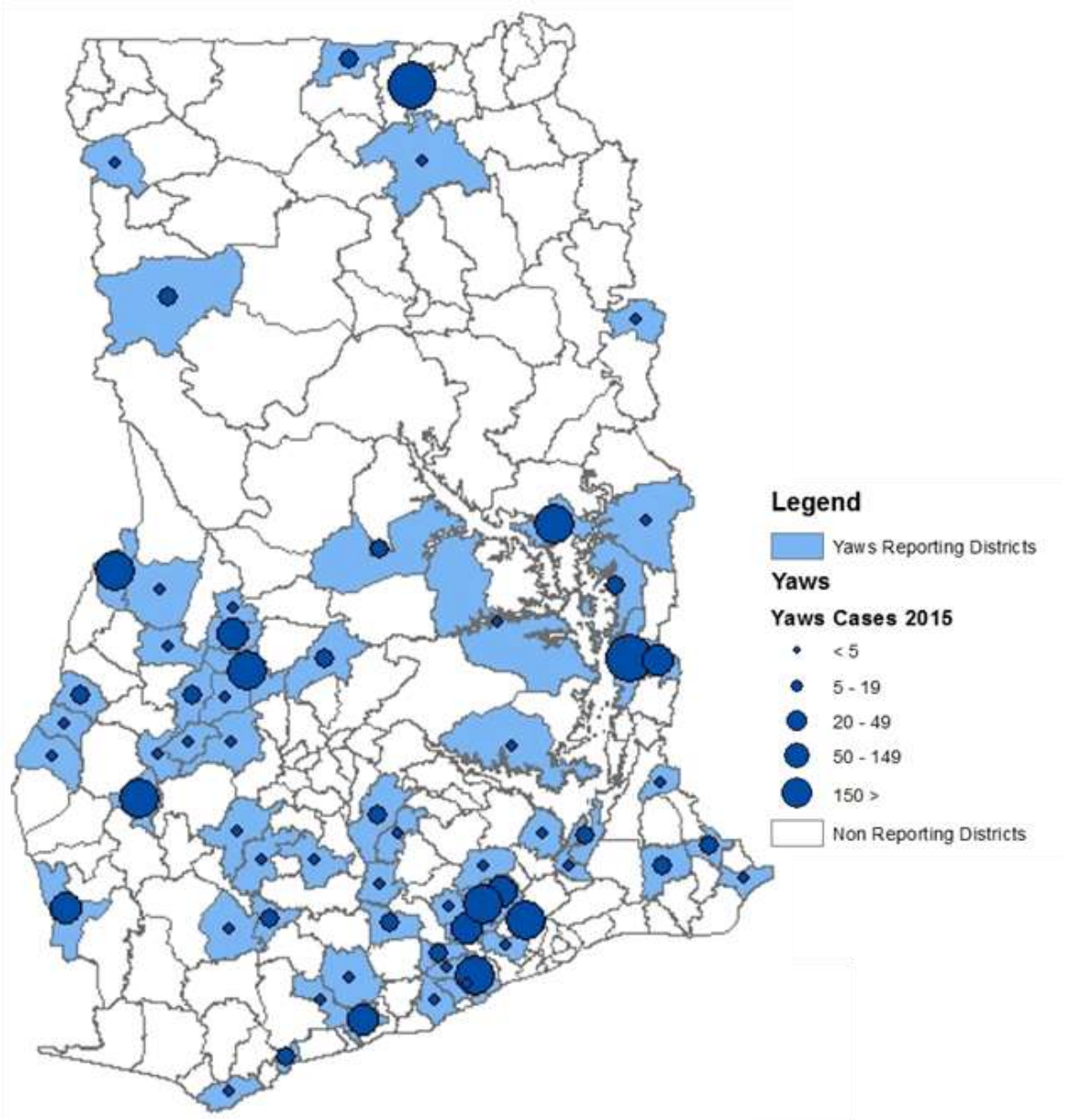

Figure 13: Yaws case distribution (2015).

Human African Trypanosomiasis (HAT)

Human African trypanosomiasis (HAT) is a neglected tropical disease that almost invariably progresses to death unless treated early. It is caused by protozoan parasites of the genus *Trypanosoma* that live and multiply extracellularly in blood and tissue fluids of their mammalian hosts and are transmitted by the bite of infected tsetse flies (*Glossina* sp), with two main subspecies of *T. brucei gambiense* and *T. brucei rhodesiense*, infectious to man, while the third subspecies, *T. brucei brucei*, is only infectious to animals. *T. b. gambiense* is responsible for the chronic form of sleeping sickness in West and Central Africa, whereas *T. b. rhodesiense* gives rise to the acute form of the disease in East and Southern Africa. The most common symptoms are headache, fever, stiffness of the body and neurologic changes including psychiatric disorders, seizures, coma and death.

In Ghana, HAT is caused by *T. b. gambiense*, with an estimated at-risk population of 4,500,000 in five out of ten regions. The first HAT case was reported in 1903. Since 1933, 93,337 HAT cases have been identified, with most cases reported from 1933 to 1960. From 1960 onwards, the number of cases dropped significantly, because of environmental modifications, such as deforestation, and vector control activities that resulted in a decline of the vector population and hence transmission. From 1980 to date only 103 cases have been registered in institutional health records, and only 1 case reported in the last decade. The last case was reported in 2013.

To assess the prevalence of the disease, various active and reactive screening exercises (2005 – 2013) were carried out in high-risk areas with previously known cases. Out of 50,976 people screened, no active infection was detected. From 2013, a surveillance system was established in ten (10) sentinel sites across the country, selected based on history and the risk of infection, to monitor the emergence of new cases. Suspected patients meeting the case definitions of fever refractory to conventional treatment, long-term headaches, enlarged lymph nodes in the neck, behavioural alterations, neurological disorders, sleep disorders, severe weight loss and weakness were screened with rapid diagnostic tests. From 2013 to 2019, 4,825 suspected patients were screened through passive surveillance, with no confirmed cases. Further, no HAT cases have been reported in any other health facilities across the country within this period. Thus, there is currently no evidence of HAT transmission in Ghana. The dossier documenting the elimination of HAT a disease of public health problem has been developed and is ready for submission to WHO by the MOH.

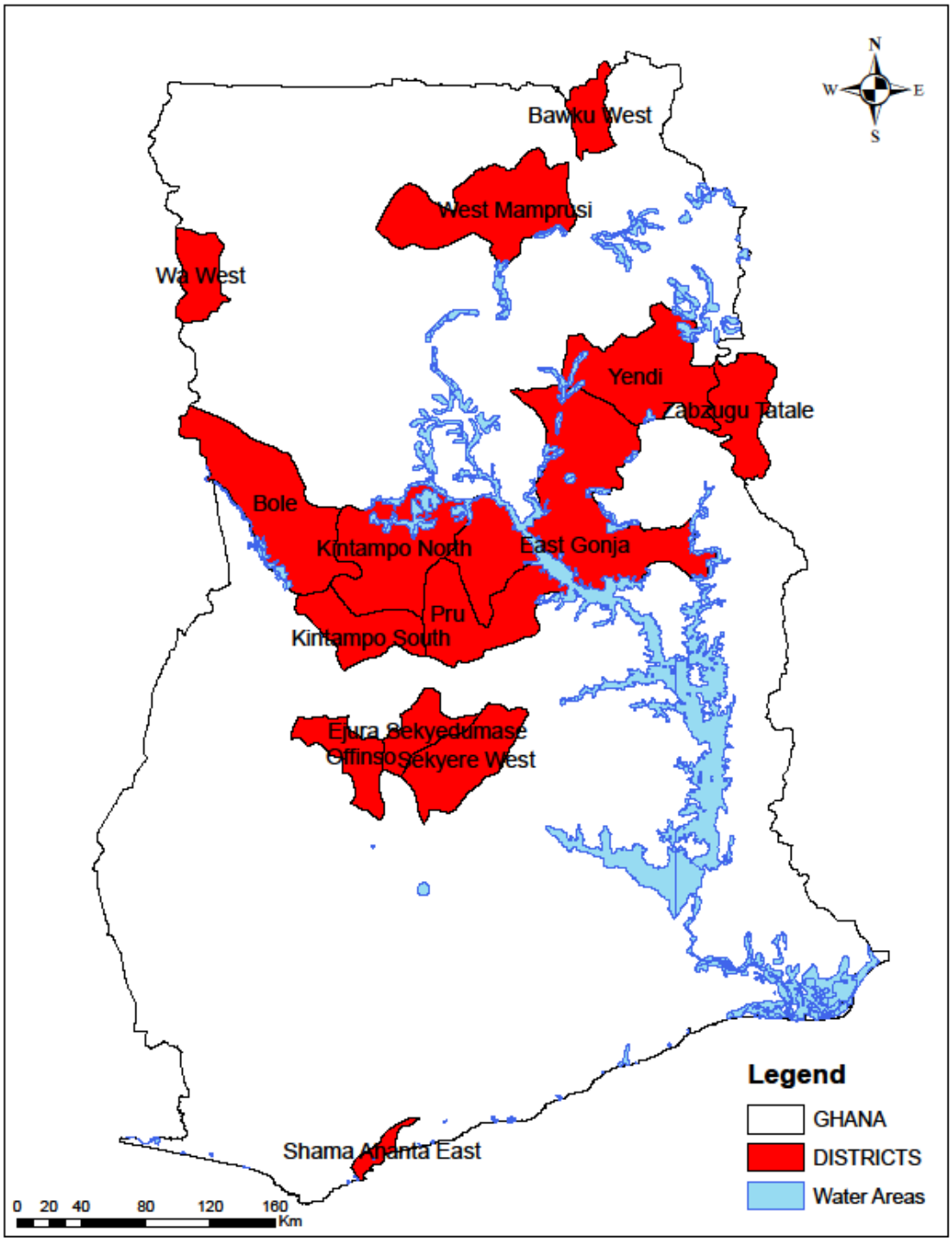

Figure 14: Districts where HAT cases have ever been reported, 1980-2010.

Rabies
Rabies is spread by infected saliva of warm-blooded animals that enters the body through a bite or broken skin. The virus travels from the wound to the brain, where it causes swelling, or inflammation. This inflammation leads to symptoms of the disease. The actual time between infection and when you get sick ranges from 10 days - 7 years. The average incubation period is 3 - 7 weeks. Symptoms may include anxiety, stress, hydrophobia and death. Rabies has been present within the dog population of Ghana for decades. Control methods have included dog vaccination and stray dog removal.

Between 1970 and 1974 an average of 72 cases of canine rabies were reported annually in Ghana. Between 2000 and 2004, public health officials reported 123 clinically confirmed human cases. Between 2010 and 2014, 22 cases were seen at the Korle-Bu Teaching Hospital in Accra[15]. Between 2015 and 2017, 33 deaths were reported in the Global Health Observatory[16]. Unfortunately, human rabies cases are rarely confirmed using laboratory diagnosis but rather on clinical diagnosis when the patient is in the advanced stage. Rabies prevention and control activities are under the Veterinary Services Division of the Ministry of Food and Agriculture. The division is responsible for dog vaccinations, and the prevention and management of rabies in dogs and other animals. It involves vaccination of dogs. Challenges in rabies control pertain to the lack of reliable data and systematic analysis of available data, underreporting, poor education and low vaccination coverage for dogs, little systematically collected and analysed data on dog bites and rabies. There is limited post exposure prophylaxis.

Leishmaniasis
Cutaneous leishmaniasis, the most common form of the disease, causes skin ulcers. Visceral leishmaniasis causes a severe systemic disease that is usually fatal without treatment. Muco-cutaneous leishmaniasis is a rare but severe form affecting the nasal and oral mucosa. Leishmaniasis is transmitted by the bite of small insects called sand flies. Many leishmanial species infect animals as well as humans.

In Ghana, only cutaneous leishmaniasis has been reported. The disease is mainly reported in the Volta region, with the first cases reported in 1999. Control measures were instituted, and cases detected in health facilities were routinely reported into the health service data capture reporting system over a number of years. After the period 1999 - 2003 CL outbreak where over 6,000 cases were reported in the Ho district, the case load decreased to 105 cases in 2004 and 14 cases in 2005. However, since 2005 no report has been submitted from both the districts and region into the DHIMS2 platform. This has created a gap in the Global Health Observatory at the WHO as well created the impression that cutaneous leishmaniasis no longer exists in the endemic area or other parts of the country. However, a mission conducted by the WHO HQ, AFRO and the Ghana Health Service in 2018 revealed the existence of active cutaneous leishmaniasis. There is therefore the need to strengthen control efforts and prevent transmission. It is estimated that 1,033,227 people living in 9 districts are at risk, with limited access to health services. An intervention targeting skin diseases will represent an added advantage to the health service delivery system.

The challenges to leishmaniasis control in Ghana are inadequate information on the current epidemiology of the disease, inadequate access to diagnosis and treatment options,

[15] S. Elieza. Trends in Dog Bites and Human Rabies in Greater Accra Region, University of Ghana, Accra, Ghana, 2016
[16] Global Health Observatory Data repository. Reported number of human rabies deaths
Data by country. Available: https://apps.who.int/gho/data/node.main.NTDRABIESHUMANDEATHS?lang=en

disconnect between NTD programme and research and lack of adequate data on the vectors The plan for leishmaniasis control in Ghana includes: the establishment of coordination mechanisms and implementation of control activities at all levels, training of frontline health staff carried out to enable them detect cases for treatment and reporting, provision of appropriate treatment for all cases, improved monitoring and supervision.

Buruli Ulcer

Buruli ulcer is a skin disease caused by *Mycobacterium ulcerans*. It a neglected tropical disease that mainly affects children aged between 5 and 15 years from poor rural communities. Transmission routes are not fully understood.

Initially Ghana reported an average of 1,000 cases annually. Since 1994 over 15,000 cases have been reported. Currently in Ghana, the Ashanti, Brong Ahafo, Eastern, Central, Greater Accra and the Western regions routinely report on the disease, although a national survey in 1999 indicated the presence of the disease in all the regions of the country. From 2010 to 2019, 5754 cases have been reported[17], with a gradual decline in the number of cases. It is however believed that the real disease burden is underestimated due to insufficient/inadequate surveillance systems, lack of consistent active case detection, and misdiagnosis.

The main challenges that confront Buruli ulcer control in Ghana are late presentation of disease, inadequate disease identification skills, lack of point of care diagnosis, inadequate logistics for wound management, challenges with disability management and rehabilitation, poor access to care in very remote areas, stigmatization of patients and lack of community promotional activities to reduce stigma and poor data quality.

The objectives of the Buruli ulcer control programme are to minimize the morbidity and disability associated with disease. This is achieved by implementing improved case detection, access to antibiotic treatment, access to wound care, prevention of disabilities and rehabilitation, strengthening existing health system and enhancing operational research.

[17] Global Health Observatory Data Repository. Number of new reported cases – data by country. Available: https://apps.who.int/gho/data/node.main.A1631?lang=en

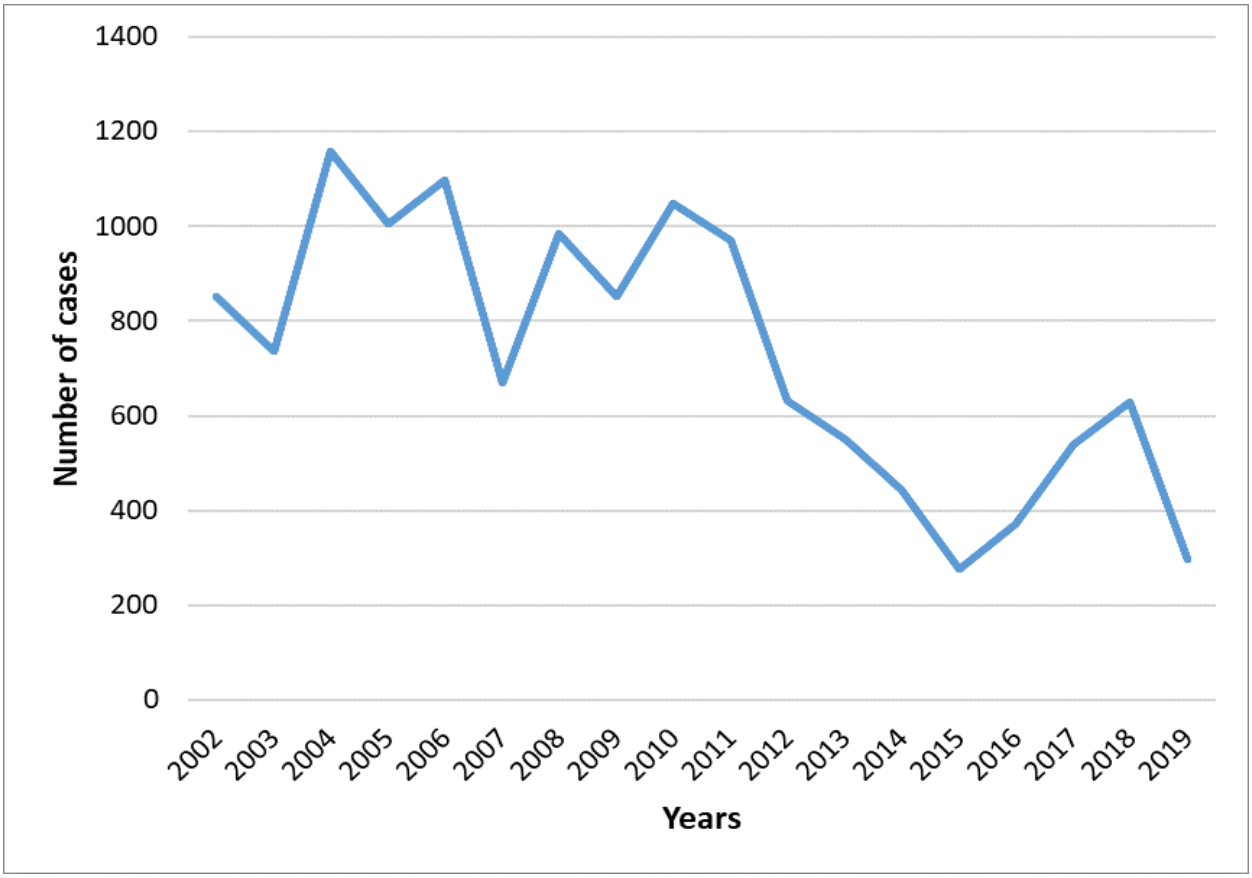

Figure 15: Number of Buruli ulcer cases reported. **Source: Global Health Observatory:** https://apps.who.int/gho/data/node.main.A1631?lang=en

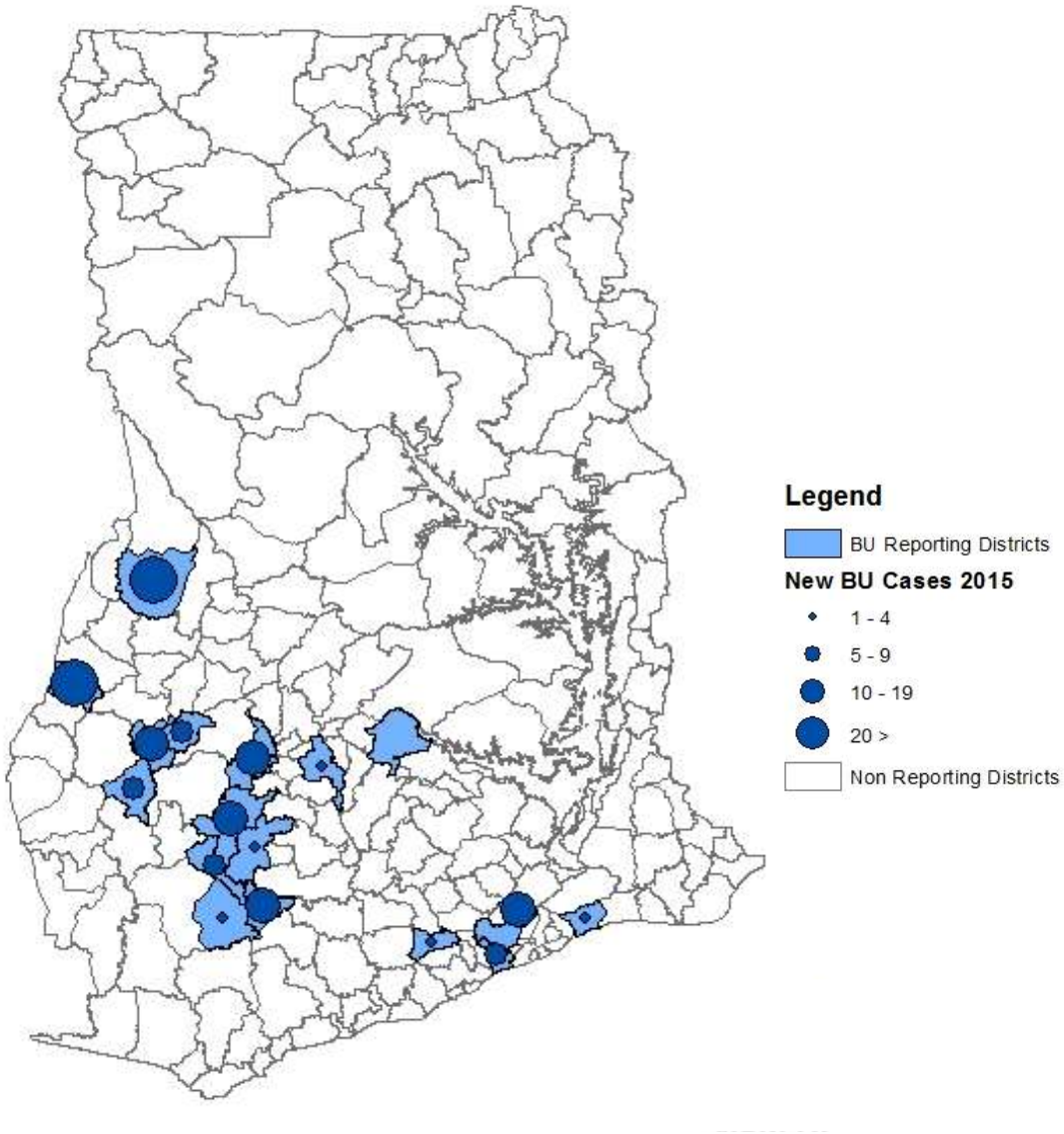

Figure 16: Buruli ulcer case distribution by district (2015).

Guinea Worm

Dracunculiasis or Guinea worm disease is a painful and disabling disease caused by a nematode called *Dracunculus medinensis*. It is transmitted though the ingestion of cyclops in fresh water. The disease is characterized by the emergence of the female *D. medinensis* from a blister, usually on the leg of the infected person.

The Ghana Guinea Worm Eradication Programme was established in 1989 in response to the World Health Assembly's resolution of 1988 which called Guinea worm endemic countries to eradicate it. In that year (1989), a case search which was conducted to ascertain the disease burden counted 179,556 cases. A total of 6,515 localities or communities reported Guinea worm disease when the programme started in 1989.

There were sharp reductions in cases for the first four to five years followed by a period of stagnation starting in 1994, when there were 8,432 cases. Between 1994 and 2004, the programme experienced stagnations and even periodic increases in cases. This stagnation was caused mainly by factors such as the Northern regional ethnic conflict of early 1994, inadequate financial support (USAID financial support officially ended in 1995) and the lack of focus (financially and technical support) resulting from the Health Reforms embarked upon during the late 90s.

Between the year 2000 and 2004, the programme underwent a series of strategic re-organisation and micro planning including the formation of an inter-agency coordinating committee. These, together with renewed commitment by the government and the partners resulted in progressive reduction in cases from 2005 to 2010. The last case was reported on the 11th of May 2010. Subsequently, having met the surveillance standards for certification, Ghana was certified free of Guinea worm by the WHO in 2015.

Leprosy

Leprosy is a chronic mildly infectious disease of man caused by *Mycobacterium leprae* affecting mainly the skin and peripheral nerves. It is transmitted through inhalation of mucosal secretion of infected persons. It is associated with nerve damage, contractures of digits of the limbs as well as ocular complications. The National Leprosy Elimination Programme is fully integrated into the general health system. The WHO elimination target of less than one case per 10,000 populations was achieved over a decade ago at the national level and efforts have been put in to sustain that achievement. All 16 regions are non-endemic hence the attention is aimed at achieving elimination at the district level.

Between 2015 and 2019, 1406 new cases were reported. 279 cases were reported in 2019, with a case detection rate of 0.92/100,000 population or 0.11 cases per 10,000 population.

The challenges to the leprosy programme are lack of funds to support activities, poor diagnostics, inadequate awareness to facilitate early reporting for those affected, low education on the disease, inadequate human resources to manage cases, inadequate logistics and drugs, and stigmatization which sometimes leads to delay in seeking medical care. The main strategies employed by the programme include early case detection, disability prevention, increase public awareness and increasing the capacity in the management of

leprosy. Identified cases are provided timely treatment and followed up to ensure full compliance by patients.

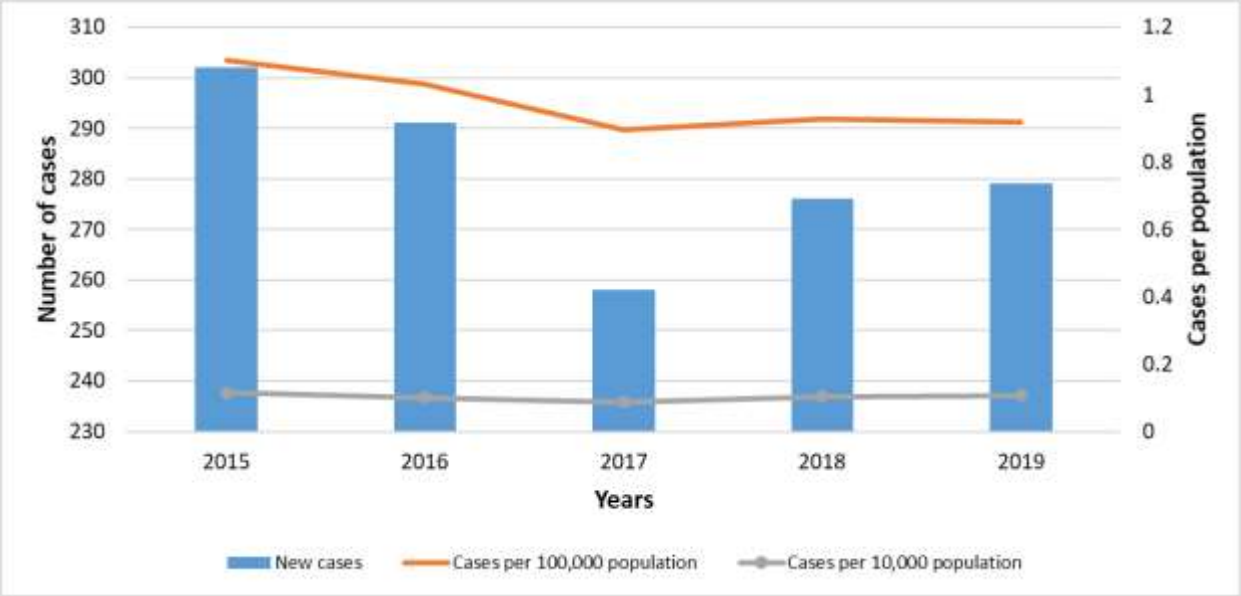

Figure 17: Leprosy cases and targets. Source: Global Health Observatory https://apps.who.int/gho/data/node.main.A1638?lang=en

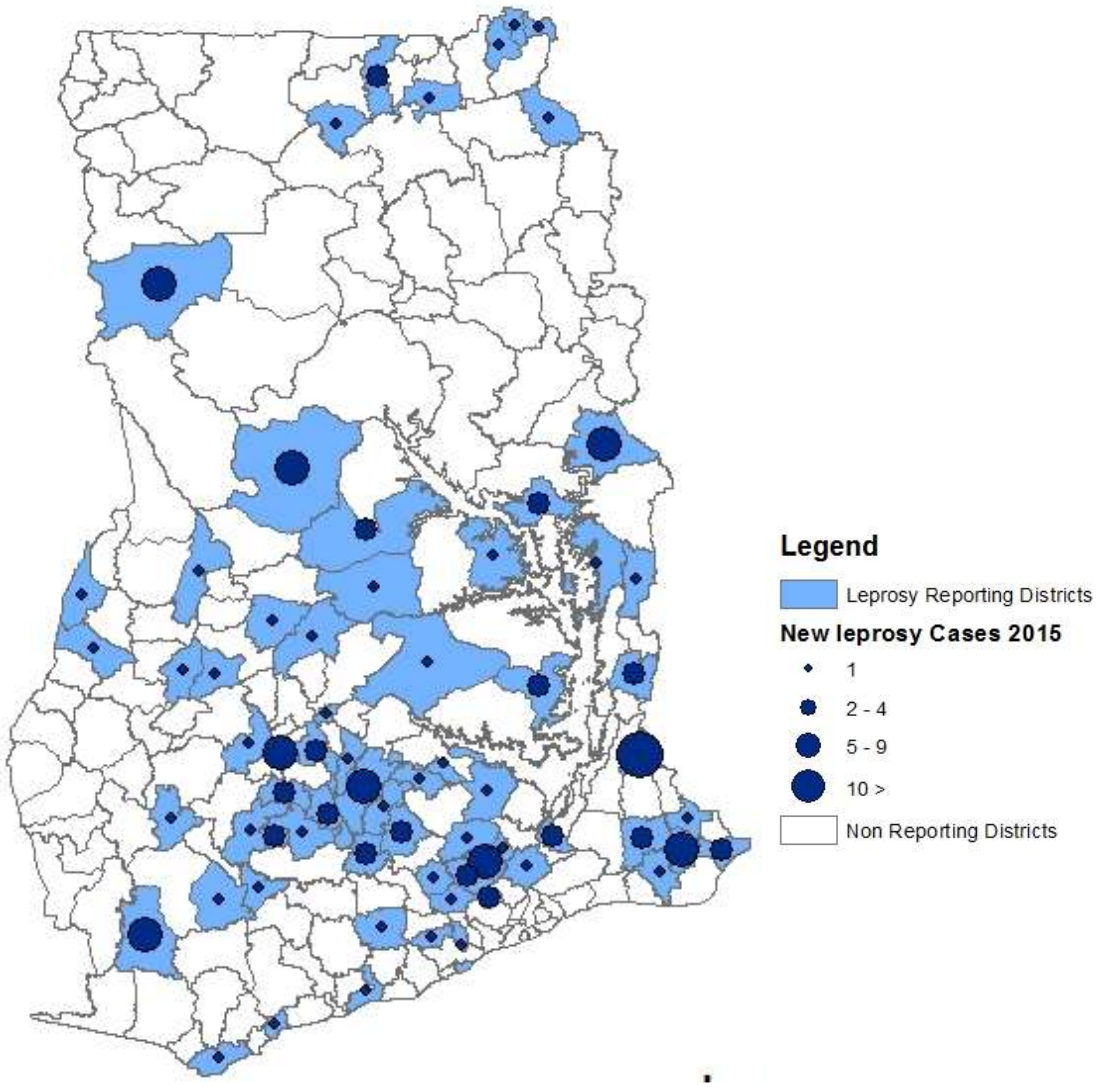

Figure 18: Leprosy case distribution, by district (2015).

Scabies

Scabies is an ectoparasitic infestation caused by the mite *Sarcoptes scabiei var. hominis*. It presents as skin lesions that are intensely pruritic. The mode of infection is through contact from person-to-person, as well as indirect sources. It is common in young children and elderly in remote and resource-poor communities. WHO estimates that scabies is prevalent in all countries, but this is accentuated by hot tropical climates, poverty and overcrowding. In Ghana, two studies identified scabies prevalence of 5.1% and 12.4% respectively[18],[19]. In a recent (2020) outbreak in East Mamprusi in the North East Region, scabies was commoner in people less than 16 years[20]. However, the nationwide prevalence of is unknown.

As a new disease recently added to the list of NTDs, there is no established programme for scabies control in Ghana. Thus, mapping to determine the extent of distribution is required. Improved access to WASH facilities by those affected would also enhance the control activities.

Snakebite Envenoming

Snakebite envenomation is an important human-wildlife conflict, with significant socio-economic loss, morbidity and mortality. It is largely a disease of poverty, mostly affecting people engaged in farming, hunting, fishing and other rural activities. In Ghana, the exact burden of snakebite envenomation is unknown. However, it is estimated that there are approximately 9600 snakebites reported annually[21].

Similar to scabies, there is no established control programme in Ghana. There is inadequate access to snake-antivenoms and lack of funding for comprehensive research for data that can inform an efficient control programme.

[18] Rosenbaum et al. Dermatology in Ghana: a retrospective review of skin disease at the Korle Bu Teaching Hospital Dermatology Clinic. The Pan African medical journal. 2017;26:125. doi: 10.11604/pamj.2017.26.125.10954

[19] Doe et al. Skin diseases in Ghana and the UK. International journal of dermatology. 2001;40(5):323–6. doi: 10.1046/j.1365-4362.2001.01229.x

[20] Amoako et al. A scabies outbreak in the North East Region of Ghana: The necessity for prompt intervention. PLoS Negl Trop Dis. 2020 Dec 22;14(12):e0008902. doi: 10.1371/journal.pntd.0008902.

[21] Graphic Online. Available: https://www.graphic.com.gh/news/health/ghana-records-av. erage-of-9-600-snakebites-a-year.html

Table 5: Known disease distribution in the Country (Source NTD Programme).

Region	No. districts	Year of data	Number of Endemic Districts													
			LF	Oncho	SCH	STH	HAT	Lep	Leish	TRA	BU *2019	Yaws *2019	Scabies	Rabies	SBE	G. worm
Ashanti	43	2020	0	29	43	43	9	40	0	0	7	7	UN	UN	UN	0
Bono	12	2020	2	4	12	12	7	11	0	0	3	3	UN	UN	UN	0
Bono East	11	2020	2	10	11	11	3	10	0	0	4	5	UN	UN	UN	0
Ahafo	6	2020	0	6	6	6	3	6	0	0	3	4	UN	UN	UN	0
Central	22	2020	20	7	22	22	3	11	0	0	5	8	UN	UN	UN	0
Eastern	33	2020	6	22	33	33	5	33	0	0	10	18	UN	UN	UN	0
Greater Accra	29	2020	16	0	29	29	5	18	0	0	2	2	UN	UN	UN	0
Northern	16	2020	16	8	16	16	5	11	0	16	0	1	UN	UN	UN	0
Savannah	7	2020	7	5	7	7	3	3	0	7	0	0	UN	UN	UN	0
North East	6	2020	6	2	6	6	5	4	0	6	0	0	UN	UN	UN	0
Upper East	15	2020	15	4	15	15	3	15	0	0	0	2	UN	UN	UN	0
Upper West	11	2020	11	8	11	11	7	11	0	11	0	1	UN	UN	UN	0
Volta	18	2020	0	8	18	18	3	14	9	0	3	1	UN	UN	UN	0
Oti	8	2020	0	7	8	8	3	7	0	0	2	4	UN	UN	UN	0
Western	14	2020	11	8	14	14	5	13	0	0	1	2	UN	UN	UN	0
Western-North	9	2020	2	9	9	9	7	5	0	0	1	3	UN	UN	UN	0
Total	260		114	137	260	260	76	212	9	40	41	61	UN	UN	UN	0
Provide endemicity level for all NTDs endemic in the country. UN = Unknown																

1.4.2. NTD Programme Performance

Completeness of mapping and survey need

All PC-NTDs in Ghana have been identified and mapped for prevention, control, or elimination. The 2016 – 2020 master plan aimed to guide programmes and activities to address the morbidity and mortality associated with NTDs. NTDs are grouped and managed under different programmes primarily due to intervention strategy employed. Lymphatic Filariasis, Onchocerciasis, Trachoma, Schistosomiasis, and Soil transmitted helminthiasis represent the five NTDs requiring preventive chemotherapy. The control of these diseases was integrated in 2007 under the Neglected Tropical Disease Programme. Prior to this, each disease was managed individually.

Mapping for LF in Ghana was completed in 2000, with the disease endemic in 49 out of 110 districts. Following several re-demarcation, LF is now endemic in 114 out of the 260 districts in 13 regions of Ghana aside Ashanti, Oti and Volta regions. The NTDP has completed between 10-17 rounds of MDA in all endemic districts, achieving 100% geographical coverage.

Ghana conducted a nationwide remapping for onchocerciasis in 2009 using REMO methodology. The results showed 29 districts were hyperendemic (nodule prevalence 40% - 60%), 15 districts were mesoendemic (nodule prevalence 20%-39.9%), 91 districts were hypoendemic (nodule prevalence < 20%) and the remaining 81 districts were non-endemic (nodule prevalence 0%). The risk populations in these endemic districts are people living or working close to rivers where the *Simulium* blackflies are present. WHO/APOC guidelines for control of onchocerciasis at the time recommended mass drug treatment for mesoendemic and hyperendemic districts only. However, the NTDP decided to continue treatment in 41 out of the 91 hypoendemic districts that were receiving treatment prior to the REMO. Since the REMO in 2009, the NTDP conducts biannual Community directed treatment with Ivermectin (CDTi) in 44 districts (29 hyperendemic and 15 mesoendemic) and annual MDA in the 41 hypoendemic districts which were receiving treatment prior to the REMO. The remaining 50 hypoendemic districts were not treated for onchocerciasis. An estimated 4.6 million persons were at risk of Onchocerciasis which was characterized as one of the key underlying factors of poverty in these areas within Ghana.

Nationwide mapping of prevalence of schistosomiasis was done from 2007 - 2010. 48, 137 and 41 districts have high, moderate and low prevalence respectively.

The nationwide mapping of STH in 2007 - 2010 revealed a low prevalence in all districts. The major STHs in Ghana are *Ascaris lumbricoides, Trichuris trichuria, Necator americanus, Acylostoma duodenale* and *Strongyloides stercoralis.* Due to the high rate of recurrence of STH the NTD programme recommends that every school aged child receives at least one round of albendazole or mebendazole treatment annually as a disease targeted for control.

Geographical coverage for all NTDs and expansion need

All the endemic districts are effectively covered by the NTD programme. For the PC-NTDs the programme strives to cover all endemic districts through the scheduled treatment activities. For LF, 100% geographical coverage has been achieved since 2006, and the

programme is currently scaling down its activities to the remaining districts requiring treatment. For onchocerciasis, the identification of new endemic areas following the shift from control to elimination in 2017, required the extension of treatment to all new endemic areas. This is currently underway, with the decision to undertake biannual treatment in all endemic areas. For schistosomiasis and STH, the coverages are more erratic and would require signigficant imporvements to achieve the control targets.

For the CM-NTDs care and support to patients is provided upon case identification and confirmation. However, active and community case detection activities are required to strengthen the CM-NTDs, where cases are scattered in remote communities, followed by contact tracing where required for diseases such as leprosy.

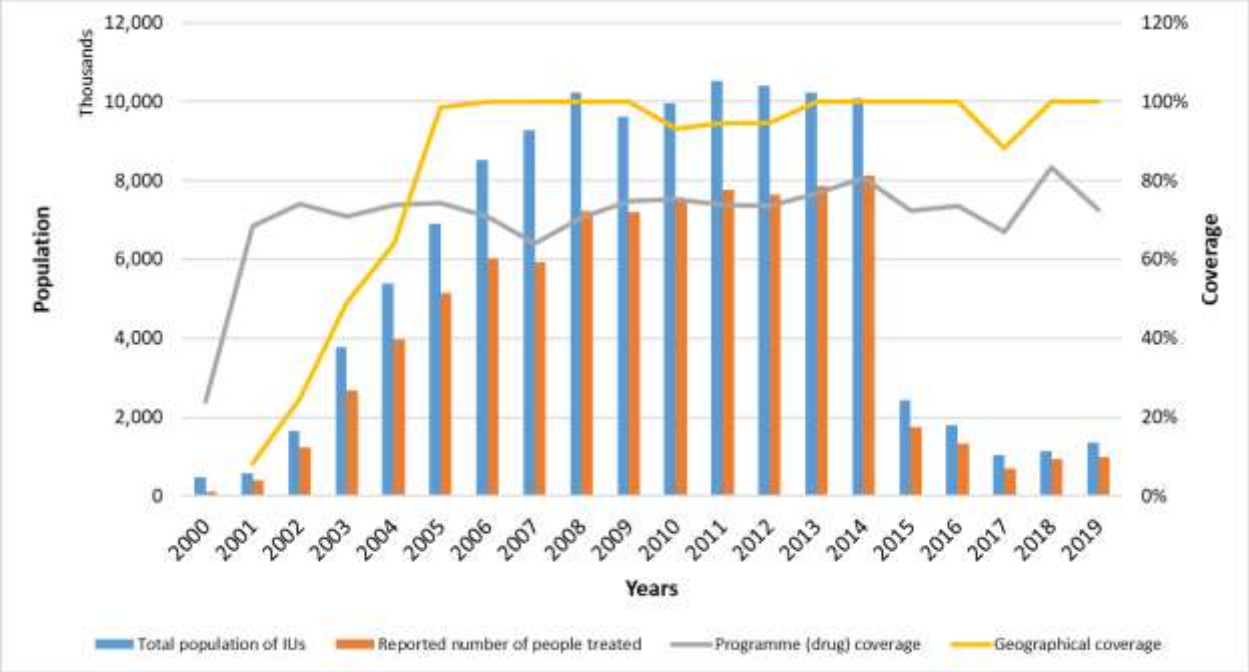

Figure 19: LF elimination targets by year and indicators in Ghana (2019). Source: PCT databank https://www.who.int/neglected_diseases/preventive_chemotherapy/lf/en/

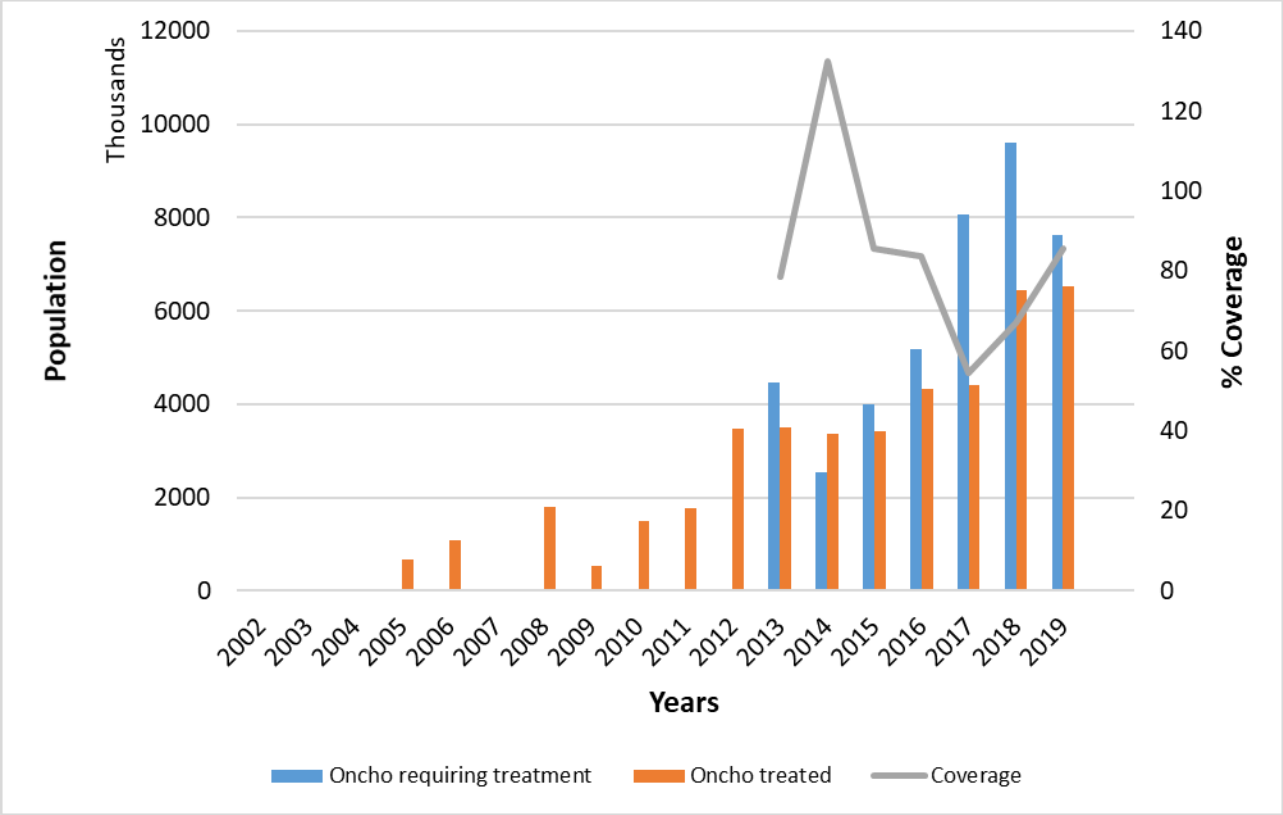

Figure 20: Onchocerciasis elimination targets by year and indicators in Ghana (2019). Source: PCT databank https://www.who.int/neglected_diseases/preventive_chemotherapy/oncho/en/

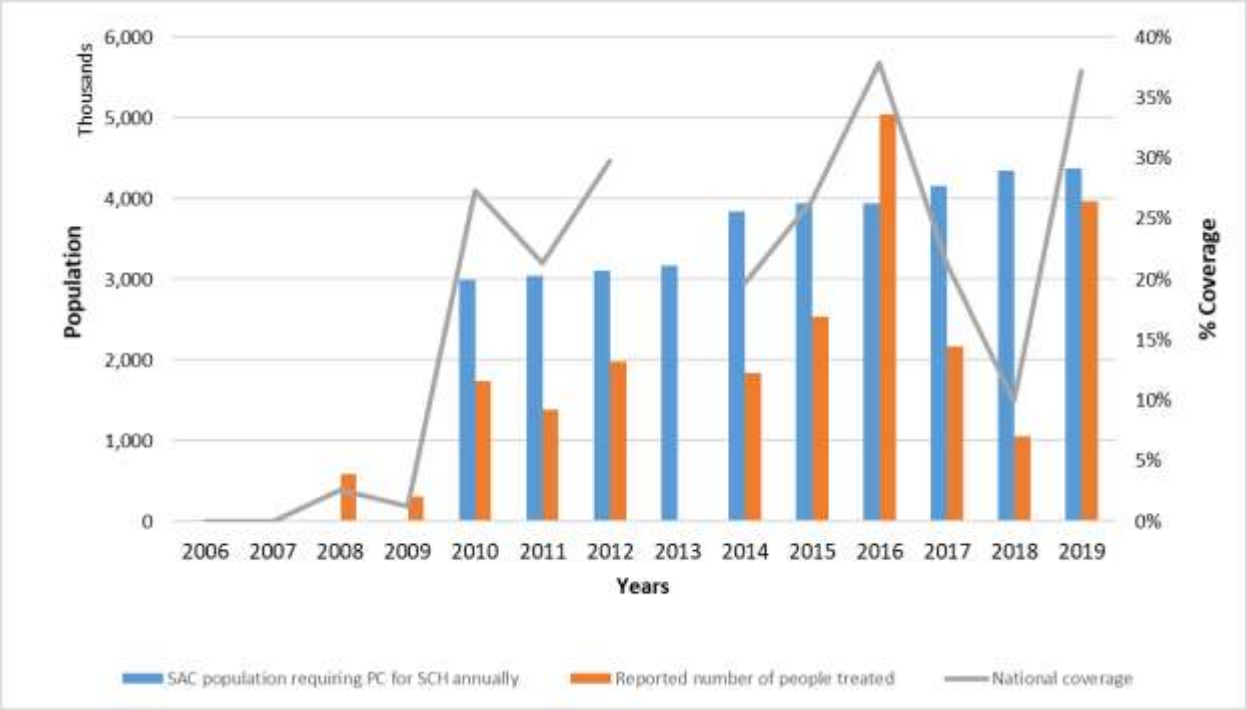

Figure 21: Schistosomiasis control targets by year and indicators in Ghana (2019). Source: PCT databank https://www.who.int/neglected_diseases/preventive_chemotherapy/sch/en/

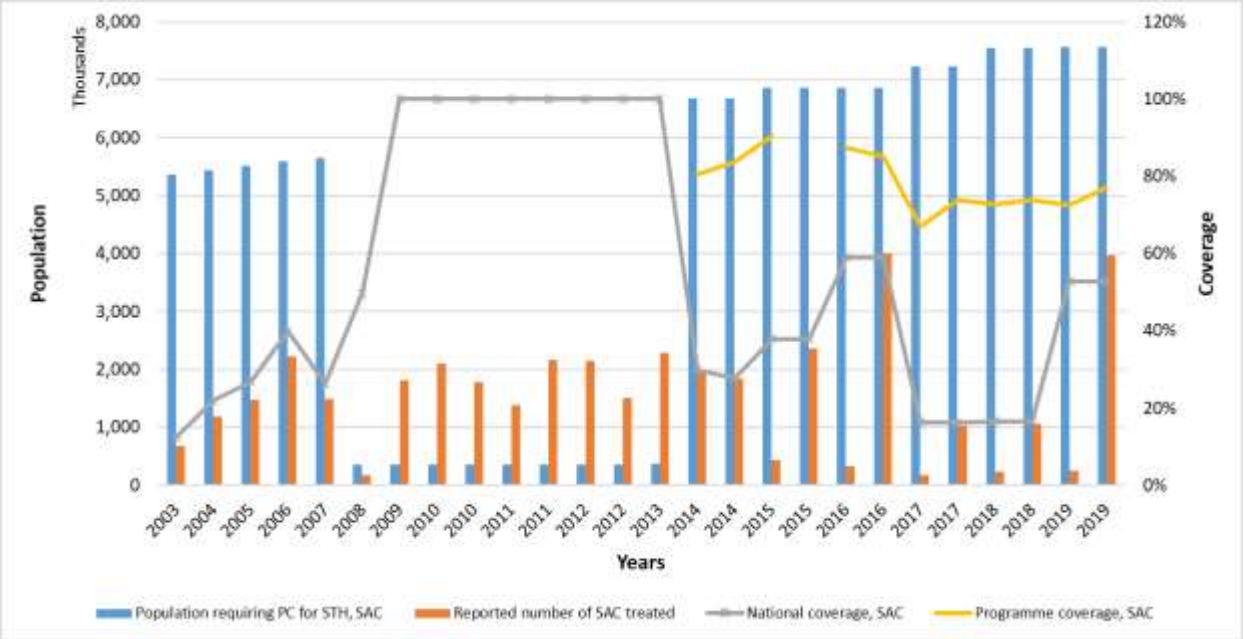

Figure 22: STH control targets by year and indicators in Ghana (2019). Source: PCT databank https://www.who.int/neglected_diseases/preventive_chemotherapy/sth/en/

Impact assessments survey results for all NTDs and need of survey

99 of the 114 LF endemic districts in Ghana have achieved interruption of transmission and have thus stopped MDAs. In the remaining districts, the programme continues to assess impact of the MDAs. In order to sustain the gains and also monitor possible recrudescence after stopping treatment in these districts, periodic surveillance in the form of transmission assessment survey (TAS) is undertaken in school children in the respective districts.

The change from control to elimination of onchocerciasis necessitated the need for a nationwide onchocerciasis impact assessment in 2017. The assessment identified an additional 35 endemic districts for treatment. Thus, a total of 137 onchocerciasis endemic districts currently require treatment for onchocerciasis.

Impact assessment for schistosomiasis was conducted in 2015, following rounds of treatment. The assessment revealed a change in schistosomiasis distribution with, 3, 54 and 159 districts having high, moderate and low prevalence respectively.

Following the validation of elimination of trachoma as a public health problem in Ghana in 2018, the NTD programme in 2019 conducted surveillance in three communities (index) that had very high seropositivity in the pre-validation survey conducted in the Country in 2015 – 2016. The three closest communities to the index communities as well as three additional communities that had no infection but seropositivity above 25% were also surveyed. A total of 15 communities were surveyed. From each community, clinical data (grading), ocular swabs from 1-9 year old and dried blood spots from all surveyed individuals, were collected and analyzed. The results of the survey indicate no recrudescence in the communities surveyed.

Reduction of number of people requiring NTD intervention and evolution of the need of tablets for PC.

There has been a considerable reduction in the number of people requiring treatment for LF and trachoma. For the other PC-NTDs more efforts are required in reaching the targetted populations. The tables below depict the reduction in the number of people requiring PC and the number of tablets needed.

Table 6: Reduction in the number of people requiring PC (Source NTD Programme).

	Population in endemic IUs	Population requiring PC by 2025
LF	14,050,747	1,035,454
Onchocerciasis	8,207,360	6,551,477
Schistosomiasis	30,800,781	5,851,743
STH - SAC	30,800,781	5,894,962
STH - Pre SAC		2,526,412
Trachoma	4,017,857	0

Table 7: PC drug requirements (Source NTD Programme)

PC Drug	2021	2022	2023	2024	2025
Ivermectin (3mg tablets)	23,111,514	16,701,579	15,726,722	16,088,436	16,458,470
Praziquantel (600mg tablets)	19,476,260	19,428,149	12,800,722	4,850,963	14,629,357
Albendazole (400mg tab)/Mebendazole (500mg tab)	945,428	967,173	536,420	548,757	561,379
Albendazole (400mg tab)/Mebendazole (500mg tab)	10,830,785	7,866,039	8,046,958	8,232,038	8,421,375
Azithromycin POS (30ml bottles)	0	0	0	0	0
Azithromycin (250mg tablets)	0	0	0	0	0

Table 8: NTD mapping status				
Endemic NTD	**Total # Districts**	**No. of endemic districts**	**No. of districts mapped or known endemicity status**	**No. of districts remaining to be mapped or assessed for endemicity status**
Lymphatic filariasis	260	114	260	0
Onchocerciasis	260	137	260	0
Schistosomiasis	260	260	260	0
Soil Transmitted Helminthiasis	260	260	260	0
HAT	260	76	Mapping not done	0
Leprosy	260	212	212	48
Leishmaniasis	260	9	9	0
Trachoma	260	40	55	0
Buruli ulcer	260	41	15	245
Yaws	260	61	15	245
Scabies	260	Unknown	Mapping not done	Unknown
Rabies	260	Unknown	Mapping not done	Unknown
Snake bite envenoming	260	Unknown	Mapping not done	Unknown
Guinea worm	260	260	260	0

1.4.3 Performance of the other programmes that are closely related to NTD programme

Vector control

LF and malaria share the same Anopheles vectors in Ghana. Several initiatives such as the government's one village one dam projects [22] expected to improve productivity and incomes of small holder farmers could contribute to the breeding of vector populations. The main vector control strategy employed in Ghana is undertaken through the malaria control programme. This is carried out through the distribution of long-lasting insecticide treated bednets (LLINs) as the main strategy, supplemented with indoor residual spraying (IRS) [23]. The AngloGold Ashanti Malaria Control Ltd (AGA Mal)[24] and the US president's malaria initiative[25] are major players in vector control in Ghana. The Vector Control unit of Zoomlion Ghana limited[26] has also initiated nationwide mapping of mosquito breeding sites followed by larviciding to reduce mosquito populations. LLIN and IRS strategies are also effective against

[22] One Village One Dam. Available: https://www.msdi.gov.gh/projects/3/

[23] Ghana – Vector Link. Available: https://pmivectorlink.org/where-we-work/ghana/

[24] CCM Ghana - AngloGold Ashanti Malaria Control. Available https://www.ccmghana.net/index.php/2018-2020/malaria/anglogold-ashanti-malaria-control

[25] US President Malaria Initiative. Available: https://pmivectorlink.org/where-we-work/ghana/

[26] Zoomlion Ghana. Available: https://www.zoomlionghana.com/component/content/article/90-blog/environment/99-zoomlion-begins-nationwide-mapping-of-mosquito-breeding-sites

indoor biting of the leishmaniasis sandfly vectors. The government through the national malaria control programme, has embarked on the coordination of partners whose activities affect vector control.

The control of vectors linked to HAT is carried out through activities of the Ministry of Food and Agriculture towards to control of animal trypanosomiasis. The vector control strategy mainly involved the alteration of the tsetse fly habitat, through selective removal of vegetation types that were associated with tsetse survival. No major, large-scale operations against tsetse and trypanosomosis have been conducted in other regions of Ghana in the past twenty years. Current control activities focus on the identification of vector breeding sites and placing of traps to catch the flies in parts of Upper East, North East and Northern Regions. Upper West Region is also being monitored for tsetse fly migration from neighbouring countries.

Activity	**Table 9. Vectors Control Interventions**					
	Mosquitoes		Other Vectors			
			Snails	Black fly	Sand fly	Tsetse fly
	LF	Malaria	Schisto	Oncho	Leish	HAT
ITN	X	X			X	-
IRS	X	X			X	
Space spraying						X
Larviciding	X	X		X*		
Traps						X
Prevention/treatment of breeding sites	X	X		X*	X	

*Vector control for onchocerciasis was done during the OCP and APOC periods.

One-Health

One-health approaches to NTD control are seldom used, and a more integrated approach and collaboration between sectors such as the veterinary services and environmental services are recommended. Rabies and HAT represent two of the NTDs in Ghana where one-health approach would be instrumental to control. A one-health round table was held in Accra in February 2018 on preventing and controlling zoonotic diseases. It brought together experts from the Veterinary Services Directorate of MoFA, GHS and the Wildlife Division of the Forestry Commission of the Ministry of Lands and Natural Resource. A one-health committee has also been established.

WASH

Coordination of WASH activities in the country

Water Sanitation and Hygiene (WASH) is critical for the control of schistosomiasis, soil-transmitted helminthiasis and trachoma. Ghana is making efforts to ensure universal access

to safe drinking water and improved sanitation facilities by the year 2025 (MWRWH, 2009). The National Community Water and Sanitation Strategy (NCWSA, 2014, p 5) also acknowledged that safe water supply services, hygiene promotion and improved sanitation leads to improved public health and economic well-being. Hand washing is actively promoted by the government as one of the most efficient ways to stop the spread of diseases. There are on-going campaigns on TV and radio, as well as in schools and health facilities, aimed at boosting awareness of the importance and practice of handwashing with running water and soap. Inadequate potable water supply and poor sanitation increase the risk of soil-transmitted helminths, trachoma and yaws, among other diseases. Through support from USAID and other funding agencies such as Relief International, the Adventist Development Relief Agency, and Winrock International, the Ghana WASH project aims to improve the water and sanitation facilities and increase hygiene education among rural and peri-urban communities to prevent the spread of diseases.

Key WASH related interventions in the country

The Ghana trachoma programme undertook some co-implementation with the Guinea Worm Eradication Programme at programmatic level in 2009-2010. An active case search for TT and Guinea worm was jointly carried out in some districts that were co-endemic for the two diseases. There was also a joint WASH programme for trachoma, Guinea worm and diarrhoeal diseases. UNICEF and other partners funded this project, which saw the drilling of many boreholes, wells and provision of improved latrines. There was solid collaboration of the programme with the partners in the WASH sector. These partners (including District Assemblies, the Community Water and Sanitation Agency, UNICEF, World Vision, WaterAid and local WASH NGOs such as New Energy and ProNet) provided data on WASH indicators. Data on facial cleanliness were, however, generally not captured by these partners. The Trachoma Programme used Guinea Worm volunteers to routinely collect and report data on WASH and trachoma in endemic communities. In addition, periodic joint Guinea worm and trachoma case-searches were organised, using community-based volunteers who moved from house to house to collect data. In the Northern region, an interagency coordinating committee comprising the Guinea Worm, trachoma, cholera, and other WASH programmes played a coordinating role that helped to identify and address WASH data gaps.

An integrated disease advocacy approach was the main strategy employed by the trachoma programme to increase provision of water to trachoma-endemic communities. Since many such communities were co-endemic with Guinea worm and other WASH-related diseases, the respective programmes engaged in joint advocacy to provide safe water and other interventions for affected communities. Interventions included provision of water and latrines in schools, sanitation promotion using the Community-Led Total Sanitation approach, and hygiene promotion by community health workers, volunteers, and mass media broadcasting[27]. In response to this joint approach, the Government of Ghana and other development partners made the presence of Guinea worm, diarrheal diseases, and trachoma major criteria for safe water provision. By the end of 2006, more than 1000 potable water sources were constructed in trachoma-endemic communities (source NTD programme).

WASH is also strongly adopted through the School Health Education Programme (SHEP) of the Ghana Education Service. The goal of the SHEP is to ensure the provision of comprehensive health and nutrition education and related support services in schools to equip children with basic life skills for healthy living, which will lead to improvements in child survival and educational outcomes, including school enrolment, retention, and academic performance.

[27] Sightsavers and WaterAid. 2013. Washing away blinding trachoma. Available: https://www.who.int/blindness/causes/WASHing_away_blinding_trachoma.pdf

The SHEP aims to conduct training to build capacity of teachers, school children and community members for effective implementation of school health programmes, inculcate into school children health-promoting habits and values of good hygiene and sanitation practices including hand washing with soap, and promote the provision of adequate, safe and sustainable water and sanitation facilities in schools, which will reinforce the practice of learnt skills for hygiene.

Menstrual Hygiene Management Campaign[28], WASH in Schools and Healthcare Facilities are evidence of school and community-based campaign programmes on WASH behaviour change initiatives that the NTDs programme could leverage on. There is evidence of national campaigns on sanitation but not much is known about their impact on NTDs. There is ample evidence of civil society advocacy initiatives which include the Mole Conference[29] and the Water Forum[30] to lead on advocacy initiatives even though these structures are not adequately used by the NTDs programme. The use of social media as a tool for advocacy and campaign has not gain much traction within the WASH and NTD space even though Ghana has a very strong media landscape. However, social and behaviour change materials such as posters, banners, flyers, fact sheets, community score cards and budget tracking have been used by both the WASH and NTD sector to target behaviour change.

The performance of the key WASH indicators in the country

At national level, the percentage of the population using an improved water source in 2014 was 64.2%: 57.0% and 71.4% in urban and rural areas respectively. Access to improved sanitation at national level was 15% in 2014: 20.5% and 9.6% in urban and rural areas respectively (GDHS 2014)[31]. According to the 2014 GDHS, 46% households in urban areas had soap and water at toilet facilities for handwashing, compared with 29% of rural households.

These have seen some improvement especially with sanitation and handwashing. According to the 2017/2018 Multi Indicator Cluster Survey (MICS 2017/18), basic sanitation at the national level was 21% with urban and rural rates at 25% and 17% respectively. Basic handwashing also within the period of 2017/18 saw an increase to 56% and 42% of households with basic facility (soap and water) for handwashing.

WASH and NTD intervention integration

It is ample evidence that WASH plays an important role in the prevention, control and elimination of NTDs[32,33]. However, despite the presence of a number of actors involved in WASH activities in the country, the WASH and NTD sectors are not well integrated. This is mainly linked to the coordination structures of the different stakeholders. A coherent and shared vision between NTDs and WASH is needed to improve coordination and effectiveness.

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[28] Ghana is pretty amazing on MHM! | MHDay (menstrualhygieneday.org)

[29] Mole Conference Series | WASH Conference (wordpress.com)

[30] Ghana Water Forum | Resource Centre Network Ghana (washghana.net)

[31] Ghana Demographic and Health Survey 2014 [FR307] (dhsprogram.com)

[32] Freeman et al. Integration of water, sanitation, and hygiene for the prevention and control of neglected tropical diseases: a rationale for inter-sectoral collaboration. PLoS Negl Trop Dis. 2013; 7(9): e2439

[33] Strunz et al. Water, Sanitation, Hygiene, and Soil-Transmitted Helminth Infection: A Systematic Review and Meta-Analysis. PLoS Med 2014; 11(3): e1001620

Coordination of WASH and NTD partners

There is very close collaboration between the programme and the WASH sector. The WASH partners of the programme, the Community Water and Sanitation Agency, UNICEF, World Vision Ghana and WaterAid Ghana, joined the programme at its inception in 2001. They were part of the group that developed the very first strategic plan and developed the session and budget for the F&E part of the programme. Local WASH partners, New Energy and ProNet, were also strong collaborators. These organizations and agencies provided safe water sources and improved sanitation for communities and households. They also participated in some health promotion activities encouraging facial cleanliness.

Currently, the organizations involved in WASH in Ghana include: GHS, Ministry of Water and sanitation, USAID, UNICEF, World Vision Ghana, Sightsavers Ghana, AIM Initiative, Right to Play, CONIWAS, Plan Ghana, WHO and WaterAid. There is the need for more effort to improve the collaboration between WASH and NTD partners through joint programme planning, implementation, and reviews of activities. Such collaboration will improve integration and the duplication of effort. Experiences and best practices from other programmes such as those for trachoma and guinea worm must be extended to other NTDs. Further there is also the need to strengthen advocacy for WASH and NTDs.

Both WASH and NTD sectors have well established coordination structures which are operationalized in a decentralised manner. The coordinating structures in the WASH sub-sector are categorized to provide leadership, policy formulation and coordination, implementation of WASH policies and programmes, Service delivery, provision of regulatory services, research coordination and advocacy structures. The coordination structures of NTDs, on the other hand, are nested in the structure of the GHS from the national level through the regions and districts to the community level. For both sectors, collaboration amongst institutions are weak, as a result of inadequate capacity and action to ensure cross- sector co-ordination, lack of uniform mechanisms and systems, information dissemination, monitoring and reporting results. As such development partners utilize their own procedures, systems and reporting requirements, instead of aligning to that of the Government. To promote multi-sectoral collaboration and strengthening coordination through multiple touch points is a critical first step going forward for joint programme planning design and implementation. Monitoring and reviews of WASH-NTD sector interventions have been strongly recommended and endorsed by key actors.

Public Health Emergencies of International Concern

Public health emergencies of international concern (PHEIC) could derail the effective control and attainment of the NTD goals. The Coronavirus Disease 2019 (COVID-19) pandemic has resulted in a major breakdown of health service provision in the fight against NTDs. Studies have also shown the potential to delay the NTD goals through the resurgence of infections[34], shortfall in funding and political commitment [35], diagnostics and supply chain disruptions[36], challenges with NTD service delivery as a result of the diversion of human capital, and impact of social mobilization and community acceptance post-COVID-19. The potential impact of

[34] NTD Modelling Consortium. Impact of COVID-19 on NTD programmes progress. 2020 [cited 28 Jun 2020]. Available: https://www.who.int/neglected_diseases/news/Impact-COVID-19-NTD-programmes.pdf?ua=1

[35] Molyneux et al. COVID-19 and neglected tropical diseases in Africa: impacts, interactions, consequences. Int Health. 2020;12: 367–372. doi:10.1093/inthealth/ihaa040

[36] de Souza et al. Diagnosis of neglected tropical diseases during and after the COVID-19 pandemic. PLoS Negl Trop Dis. 2020;14: e0008587. Available: https://doi.org/10.1371/journal.pntd.0008587

COVID-19 on delaying the attainment of the WHO NTD 2030 control and elimination goals has been shown[37].

At the height of the pandemic in 2020, the WHO issued guidance on the conduct of NTD activities, effectively suspending all MDA activities, except those requiring patient management[38]. The recommendations aptly identify most of the considerations for conducting MDA during COVID-19. Furthermore, the recommendations also suggested the need for field teams in MDA areas to be consulted prior to restart in order to grasp the operational realities in field settings. In Ghana, the Government also issued a ban on travel, gatherings, and school activities, resulting in the delay in implementation of many NTD programme activities for over a year. However, COVID-19 has also led to the development of innovative approaches to addressing the COVID-19 challenges to the NTD programme, through strengthening health systems, facilitating integration between diseases and cross-sector collaboration, improving and optimizing programme interventions delivery[3940]. It is therefore imperative for the NTD programme to collaborate with all sectors in addressing the COVID-19 challenges and other PHEICs.

[37] Chaumont et al. The SARS-CoV-2 crisis and its impact on neglected tropical diseases: Threat or opportunity? PLoS Negl Trop Dis. 2020;14: e0008680. Available: https://doi.org/10.1371/journal.pntd.0008680

[38] World Health Organization. COVID-19: WHO issues interim guidance for implementation of NTD programmes. 2020 [cited 21 Feb 2021]. Available: https://www.who.int/neglected_diseases/news/COVID19-WHO-interim-guidance-implementation-NTD-programmes/en/

[39] Molyneux et al. Neglected tropical diseases activities in Africa in the COVID-19 era: the need for a "hybrid" approach in COVID-endemic times. Infect Dis Poverty. 2021;10: 1. doi:10.1186/s40249-020-00791-3

[40] Brooker et al. Neglected tropical disease control in a world with COVID-19: an opportunity and a necessity for innovation. Trans R Soc Trop Med Hyg. 2020. doi:10.1093/trstmh/traa157

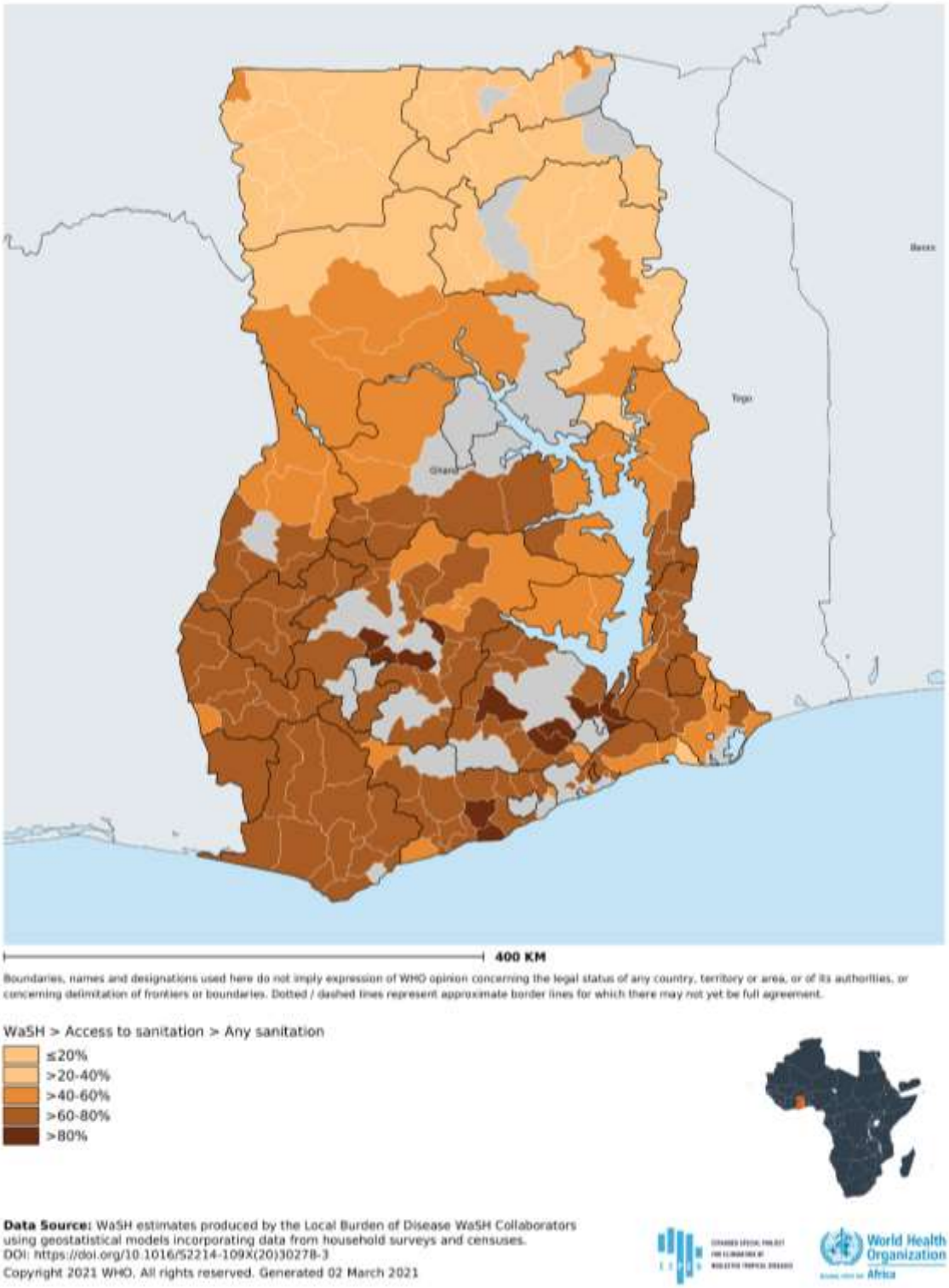

Figure 23: Access to any improved and unimproved sanitation in Ghana (2017). Source: Ghana | ESPEN (who.int)

Table 10: Summary of intervention information on existing NTD programmes

NTD	Date programme started	Total districts targeted (2020)	No. districts covered (geographical coverage*) [2020]	Total population in target district (2020)	National coverage (%)	No. (%) districts with required number of effective treatment rounds	No. (%) districts that have stopped MDA	Key strategies used	Key partners
Lymphatic filariasis	2001	114	114	14,050,747	14,050,747 (100%)	114 (100%)	99	MDA	GoG, WHO, USAID, BMGF, ASCEND, AIM initiative, GSK, MDP
Onchocerciasis	1974	137	137	8,207,360	8,207,360 (100%)	137 (100%)	0	Vector control, MDA	GoG, WHO, Sightsavers, USAID, ASCEND, MDP
Schistosomiasis	2007	260	260	30,800,781	30,800,781 (100%)	260 (100%)	0	MDA	GoG, WHO, USAID, PCD, VRA
STH	2007	260	260	30,800,781	30,800,781 (100%)	260 (100%)	0	MDA	GoG, WHO, USAID, PCD, GSK
HAT	2007	75	75	1,200,000	46,000 (3.8%)	N/A	N/A	N/A	GoG, WHO, Ministry of Agric (Vet)
Leprosy	1950	260	260	30,800,781	30,800,781 (100%)	N/A	N/A	Case Identification Case Management (including MDT, disability prevention & mgt. and treatment of reactions); Contact Tracing; Chemoprophylaxis;	GOG, WHO, IALO, Leper's Aid, Anesvad, GPZL

								WASH	
Leishmaniasis	2018	18	9	2,100,000	9	N/A	N/A	N/A	WHO Only
Trachoma	2000	40	40	4,017,857	4,017,857 (100%)	40 (100%)	40	SAFE, surveillance	GoG, WHO, Sightsavers, USAID
Buruli ulcer	1998	89	89		Unknown	N/A	N/A	Surveillance, Wound management	WHO, ANESVAD
Yaws	2008	260	260	30,800,781	Unknown	N/A	N/A	Active surveillance and response	WHO, ANESVAD
Scabies	-	260	260	Unknown	Unknown	N/A	N/A	MDA	Ernest Chemists
Rabies	-	260	260	Unknown	Unknown	N/A	N/A	PEP	
Snake bite	-	260	260	Unknown	Unknown	N/A	N/A	PEP	-
Guinea worm					NA	N/A	N/A	Surveillance	-

*Geographical coverage = No. of districts covered by the programme / Total no. of endemic districts in the country

Section 1.5: Building on NTD Programme Strengths

Table 11: SWOT analysis for NTDs

Elements	Strengths	Weaknesses	Opportunities	Threats
Capacity–management, human and logistic resources, delivery systems and structures	• Existing senior managerial capacity with vision for integration at the highest level • Availability of a cadre of health workers and trained volunteers • Already existing integrated PCT diseases and case management programmes • In-kind Government contribution in terms of staff and resources • Availability of ICCC coordinating mechanisms	• Human resource constraints in terms of quality and number trained personnel • Inadequate transport to carry out MDA activities • Poor understanding of NTDs transmission and control by health workers and communities • Lack of equipment for diagnosis • Inadequate data management structures and complex reporting tools, resulting in data inconsistency, and inaccurate data, untimely data submission • Same personnel responsible for data management and M&E	• Improved funding for NTDs which will foster integration among all NTDs	• Present resource constraints makes programme unattractive • Micromanagement by some partners • Lack of donor drugs for some NTDs
Implementation or programme delivery	• A committed and well-structured decentralised health system and community structures for programme delivery • Existing training units with experts to handle training at all regional and district levels of the Ghana Health Service • Availability of clear strategies and tools (protocols, guidelines) for programme delivery • Availability of technical and logistic support from experienced NGOs and partners • Effective planning for resources and commodities	• Inadequate funding and support from government • Competing health activities • Vertical structures and systems may result in staff of NTD's resisting change associated with integration. Slow national effort for integrated programming, lack of relationship and harmonization between NTD activities and other national activities (e.g. WASH). • Poor knowledge and inadequate staff for case detection and in the management of cases of NTD	• Strong collaboration of other MDAs (MOE, MOWAC, MLGRD and others) • Some activities of NTDs could be incorporated into other public health interventions for leverage in funding • Commitment by central government, district assemblies, NGOs and communities • Opportunity to collaborate with research institutions for M&E, implementation / operational research • Decentralization of NTD activities with regional and district offices	• Negative propaganda about the safety of integrated drug distribution and experiences of side reactions associated with treatment • Insecurity (e.g. ethnic strife) and natural disasters (flooding, climate change). Attacks on programme personnel during MDAs, by armed robbers. • Poor transportation and road networks • Lack of political commitment to support the programme on a sustainable basis. • Misconception of MDA treatments being related to COVID-19. • COVID and other health emergencies on NTD implementation and delays.

	• Availability of committed health workers in districts and community-based volunteers in all endemic communities • Increased collaboration between PC and CM NTDs • Internal mobilization of resources	morbidity among health workers • Delays in receiving laboratory results • Low sensitivity of diagnostics Long travel distance to endemic communities • Multiple partners with different timelines and reporting needs put increasing demands on programme management • High MDA coverages not translating into disease interruption.	resourced to carry out their own activities • Establishment of a viable resource mobilization sub-committee of ICCC	
Advocacy, communication, IEC and supporting policies	• Programme promotes and strengthens PHC • Available advocacy strategy for implementation • Availability of some mass media and IEC materials • Established clear access channels of communication for political leaders and clear community entry techniques • Complete mapping of all PCT NTDs and some case management conditions • Increased profile of the NTD programme at the international level	• Misconceptions about NTDs and its management • Poor attitude of some communities to accept the drugs and control interventions • Political bottlenecks and passive attitude of some district assemblies • Improper timing of health promotion and advocacy events • NTDs not seen as diseases of priority by some health staff	• Country (e.g., GPRS II) and regional (e.g., WAHO, NEPAD Health Strategy, AU Health Strategy) strengthen NTD Programme implementation • Committed partners (e.g., GHS, GES, central and local government, Drug companies, multilaterals, Support Centres, Communities, NGOs) • Availability of parliamentary select committee for health and gender and children • Partner support	• Apathy of political leaders, general public and community leaders • Inadequate funds and resources to implement advocacy strategy • Challenge of managing complications of NTDs and recurrence of some surgically managed cases • Operational research issues such as recrudescence of onchocerciasis, high prevalence of LF in certain districts in spite of several years of MDAs, efficacy of available case management treatment
Incentives and motivation	• Availability of effective and well tolerated donated drugs with minimal side effects for preventive chemotherapy and case management	• Competing health activities and incentives between programmes • Demand for higher incentives by community drug distributors, leading to attrition during programme activities • CDD apathy Community fatigue, fear of adverse events	• Improved drug supply and resources by partners • Integration results in efficient use of resources • Committed community members and integration with other disease programmes	• De-motivation of volunteers by comparing incentives with other NGOs (e.g. better incentives) • Micro-management of programme by some partners Possibility of government's inability to sustain the programme after cessation of donor support

A SWOT analysis on the current status of control of NTDs in the country was done. See Table 9; SWOT analysis of NTD programme. Gaps identified from the SWOT analysis will be addressed from the planning stage through the implementation and monitoring and supervision stages as outlined below:

1.5.1: Planning

The Master Plan for NTD programme in Ghana is a comprehensive strategic document that will serve as a guide for all stakeholders implementing NTD control /elimination /eradication activities. It has been jointly developed with partners under the leadership of the Ministry of Health. With the strong partner support, some advocacy, commitment of the programme staff, the existing political goodwill, and the new global interest on NTDs, it is believed that there will be a strong NTDs financial base that will support successful programme implementation.

1.5.2: Coordination and Management

The NTD programme managers have been appointed and this will help to move the programme forward to change the previous situation where implementation of NTDs has been uncoordinated with vertical programmes, which compete with each other.

The NTDs programme will work closely with NTD ICCC, Onchocerciasis Experts Committee, the NTD task force and other committees to ensure increasing harmonization, coordination and planning of programme activities.

1.5.3: Partnerships

There is a network of partners on NTD within the country. The partners work together in a coordinated manner through all stages of the programme in order to achieve the goal and vision of the NTD programme. The partners have contributed towards the development of this document apart from supporting specific NTD activites in the country. Partners are expected to buy into the NTD Master plan and support activities to address the identified gaps. Establishing platforms for coordination, information sharing and communication between the NTD programme and partners would enhance the efficient and timely operationalization of NTD programme activities in the country. The network in the Ministry of health enjoys the collaboration of other line Ministries such as the Ministries of Education and Agriculture.

1.5.4: Implementation of Interventions

Implementation of NTD programme in Ghana requires sensitization of stakeholders to address the misconceptions and mobilize the communities, whose role is paramount to the success of the programme. CHPS as a promising strategy which has shown remarkable success in reducing maternal mortality rates, improving family planning acceptor rates, immunization, and mass drug administration coverage in poor and underserved areas. The CHPS concept is currently embraced nationwide as a strategy to bring health care closer to the communities and can serve as the vehicle for implementing most integrated public health interventions that include preventive chemotherapy and case search for the neglected tropical diseases.

Almost all NTD activities are implemented by the National NTD team. Building capacity at the regional and the district levels will ensure ownership of the programme at these levels and enable the conduct of activities with minimal support from the national team.

IE&C materials, advocacy packages, training manuals and monitoring tools will be developed and disseminated. Opportunities such as committed partners, donated drugs for some of the

NTDs, increasing global focus on NTDs will greatly reduce the cost of implementing activities and sustaining the gains.

1.5.5: Surveillance, Monitoring and Evaluation

Monitoring and evaluation of some of the NTD is already being done within the national health information management system (HMIS). The NTD programme will therefore take urgent steps to ensure that all diseases are inbuilt into the HMIS of the Ministry of Health as a strategic priority. The District Health Information Management System (DHIMS) provides the GHS a chance to standardize, collect and collate essential data at the district level. This will further strengthen the system making it more functional. NTDs will also be incorporated and monitored through the existing IDSR system, and also there will be programme self-monitoring.

PART 2
Strategic Agenda: Purpose and Goals

Section 2.1: NTD Programme Mission and Vision

Mission and vision	
Mission	The mission is to contribute to socio-economic development and wealth creation by promoting health, vitality and ensuring access to quality health services for all people living in Ghana.
Vision	A Ghana free of NTDs and its associated morbidities and disabilities

Section 2.2: Strategic Goals, Milestones and Targets

2.2.1. Strategic goal

Strategic goal
To prevent, control, eliminate or eradicate the Neglected Tropical Diseases from Ghana by the year 2030.

2.2.2. Targets

Overarching targets

Below are the targets for the various NTDs to be achieved by 2025.

Overarching targets

By 2025 in the country:

- Transmission of LF interrupted in all districts and MDA stopped
- Capacity for LF morbidity management and disability prevention improved in all endemic areas as part of universal health coverage
- Transmission of onchocerciasis interrupted in all transmission zones.
- At least 75% of all school aged children and high-risk populations in schistosomiasis endemic areas treated
- All school-aged children treated for STHs at least once every year
- Post-validation surveillance of trachoma sustained
- The number of grade III BU cases reduced to less than 18%

- Transmission of yaws interrupted
- Ghana certified free of HAT as a public health problem
- 85% of Cutaneous leishmaniasis reported and 95% of reported cases treated
- Zero new autochthonous leprosy cases reported
- Zero deaths from rabies reported
- Scabies management incorporated into the universal health coverage package of care
- Snakebite mortality reduced by 50%

Cross-cutting Targets

The below figure shows the cross-cutting targets of the NTD programme.

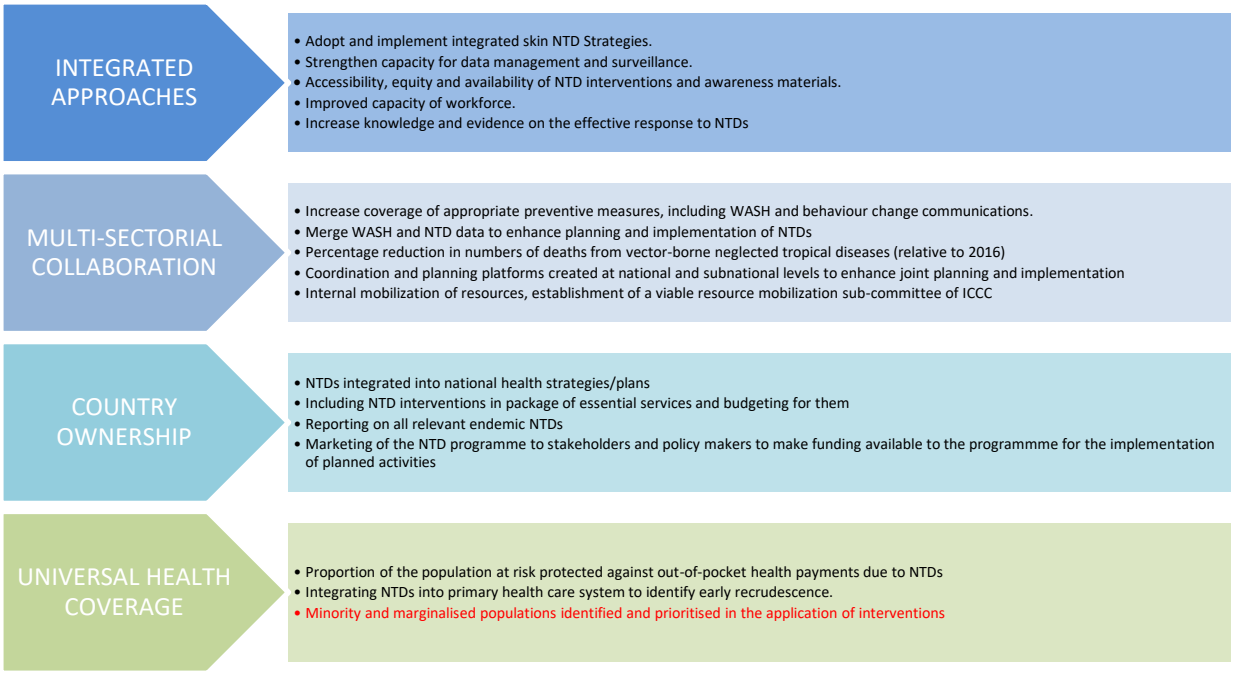

Figure 24: Cross-cutting targets of the NTD programme

Disease-Specific Targets

Table 12. Disease-Specific Targets

National target	Diseases	Objective	Year	Strategies
Targeted for eradication	Yaws	To report zero cases of yaws	2025	• Capacity building in case detection and treatment of all cases and contacts at all levels • Strengthen Yaws Surveillance at all levels
Targeted for Elimination (Interruption of Transmission)	HAT	To be certified for elimination	2022	• Submit dossier for certification
	Onchocerciasis	To interrupt transmission	2025	• Implement twice-yearly treatment in all endemic communities • Establish effective surveillance system in all districts
	Leprosy	To reduce new leprosy cases with G2D to less than one case per million population.	2025	• Undertake case detection, treatment and management through case search • Increase awareness of health staff and community members through capacity building • Active surveillance
Targeted for elimination as a public Health problem	Lymphatic filariasis	To interrupt transmission of LF	2025	• Mass Drug Administration • Provision of MMDP • IVM in collaboration with malaria programme • Improved surveillance
	Schistosomiasis	To treat 75% of school children and high-risk populations	2025	• School-aged mass drug administration and community-based among high-risk adult population • increase awareness of prevention and control of schistosomiasis • Improve WASH practices • Improve M&E
	STH	To treat all school-aged children at least once every year	2025	• School-based mass drug administration • Improve WASH practices • Improve M&E
	Rabies	To reduce the number of deaths due to rabies to zero	2025	• Advocacy for the control of rabies • Strengthen inter-agency collaboration for rabies elimination • Strengthen policy environment for the prevention and control of human rabies

				• Availability of pre and post exposure prophylaxis
Targeted for control	Leishmaniasis (cutaneous)	85% of all cases are detected and reported and 95% of reported cases are treated	2025	• Capacity building of health workers for case detection • increase public awareness in endemic areas • Effective vector control through inter-agency collaboration
	Buruli ulcer	To reduce the number of grade III BU cases to less than 18%	2025	• Early case detection and management • Health systems strengthening • Advocacy for BU in context of NTD • Research and innovation • Increase surveillance • integrate BU case search into national population interventions in endemic districts
	Scabies	To map and incorporate scabies management into the universal health coverage package of care	2025	• Capacity building of health workers for case detection • Increased advocacy
	Snakebite envenoming	To reduce snakebite mortality by 50%	2025	• Improved surveillance • Adequate provision of antivenom

2.2.3. Milestones

In order to achieve the overarching, cross-cutting and disease-specific targets as set forth in this strategic plan and given the progress so far made as elucidated in the fore-going sections a number of milestones should be undertaken. These disease specific milestones are reflected in table 11.

Table 13. Milestones for targeted NTDs

Deasease	Indicators	2021	2022	2023	2024	2025
Lymphatic filariasis	Number of endemic districts with transmission interrupted and MDA stopped	103 (90%)	103 (90%)	114 (100%)	114 (100%)	-
Lymphatic filariasis	Number of endemic districts with essential package of care for MMDP	114 (100%)	114 (100%)	114 (100%)	114 (100%)	-
Lymphatic filariasis	Dossier for verification of absence of LF transmission	-	-	-	-	Preparation of dossier
Onchocerciasis	Proportion of districts that have interrupted transmission		68 (50%)	103 (75%)	130 (95%)	137 (100%)
Schistosomiasis	Proportion of school-aged children	75%	80%	85%	87%	90%
Schistosomiasis	Proportion of out of school children	10%	20%	30%	40%	50%
Schistosomiasis	Proportion of high-risk communities	10%	20%	30%	40%	50%
STHs	Proportion of school-aged children treated	75%	85%	100%	100%	100%
Buruli ulcer	Proportion of lesions detected (nodules/plaques)	60%	75%	100%	100%	100%
Yaws	Yaws prevalence	0.6%	0.5%	0.35%	0.1%	0%
HAT	Submission of certification dossier	Certification	Post-certification surveillance			
Cutaneous leishmaniasis	Number of districts where with capacity to detect cases	5	10	15	20	25
Rabies	Proportion of hospitals with post and pre-exposure prophylaxis	60%	75%	85%	95%	100%
Leprosy	Proportion of disability grade 2 cases	15%	10%	5%	0%	0%
Guinea worm	Certified in 2015	Post-certification surveillance				
Trachoma	Certified in 2018	Post-certification surveillance				

Section 2.3: Guiding Principles

Guiding principles
• National leadership and ownership, • Commitment to collaboration and sharing, • Mutual accountability of national authorities and partners, Transparency and accountability, • Community engagement and participation

Section 2.4: Strategic Pillars and Strategic Objectives

2.4.1. Programme Strategic Pillars

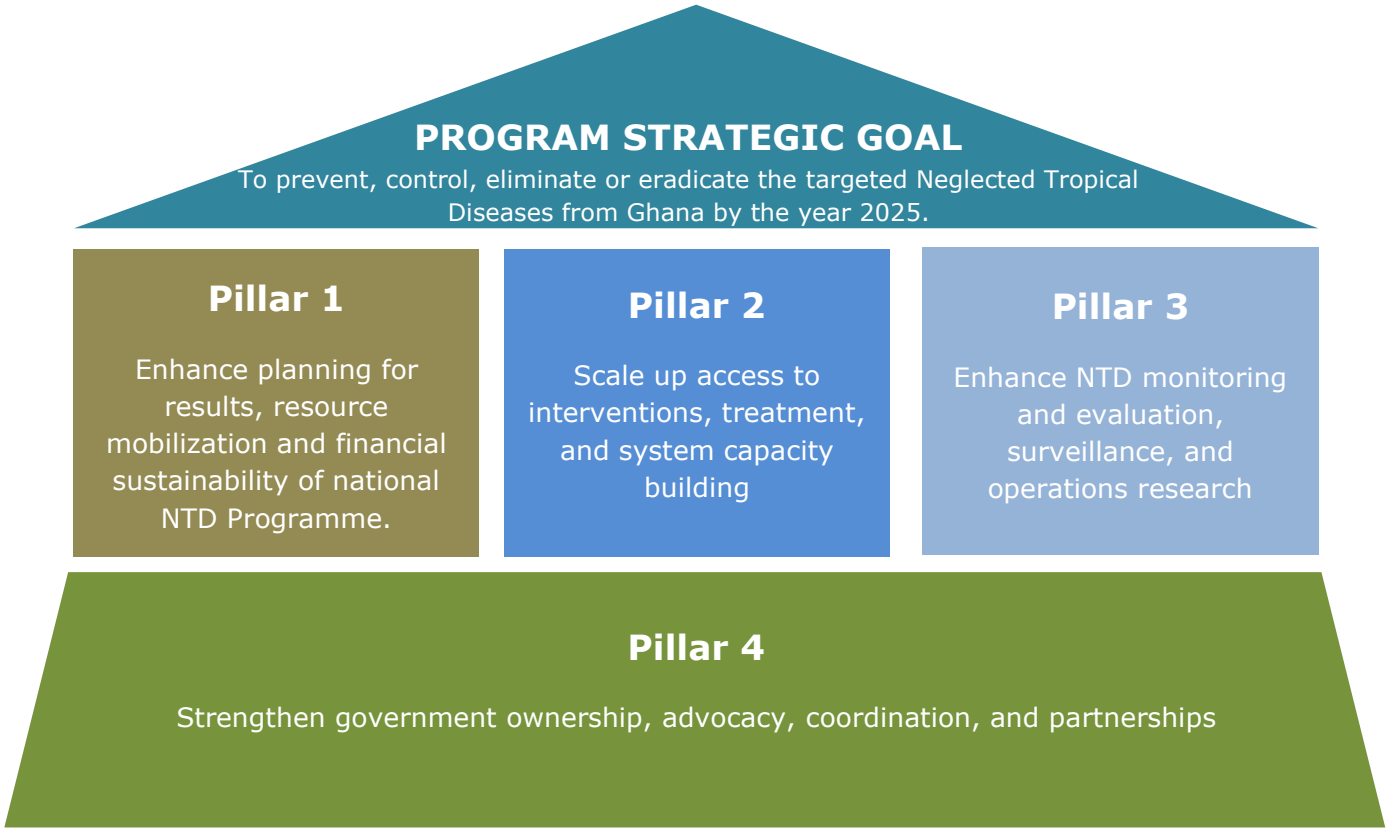

Figure 25: Programme Strategic Pillars

2.4.2. Strategic Objectives

Table 14. Strategic Objectives for the Elimination of Neglected Tropical Diseases

Strategic Pillar	Objectives
Pillar 1. Enhance planning for results, resource mobilization and financial sustainability of national NTD Programme.	1. Operationalize the NTD finance strategy 2. To enhance resource mobilization approaches and strategies at national and regional levels for NTD interventions 3. Work with Finance Strategy Taskforce to build business cases/proposals to be submitted to identified resource partners. 4. Strengthen the ICCC and partnerships
Pillar 2. Scale up access to interventions, treatment and system capacity building	1. Scale up an integrated preventive chemotherapy, including access to onchocerciasis and schistosomiasis interventions. 2. Scale up integrated case management disease interventions (Yaws, Buruli Ulcer, Rabies, Cutaneous Leishmaniasis, leprosy and scabies) and LF morbidly control. 3. Strengthen integrated vector management and environmental measures for targeted NTDs. 4. Strengthen capacity at all levels for NTD programme management and implementation. 5. Identify individuals and groups that are likely to be left out in NTD interventions application and prioritise them.
Pillar 3. Enhance NTD evaluation, surveillance and operational research	1. Enhance monitoring of national NTD programme performance and outcome. 2. Strengthen surveillance of NTDs and strengthen the response and control of epidemic prone NTDs. 3. Enhance operational research, documentation and evidence to guide innovative approaches to NTD programme interventions. 4. Establish integrated data management system and support impact analyses for NTD as part of the global NTD data management system and plan. 5. Enhance NTD monitoring and evaluation, surveillance and operational research.
Pillar 4. Strengthen government ownership, advocacy, coordination, and partnerships	1. To ensure the capacity of the government of Ghana to effectively and efficiently scale up and deliver all NTDs interventions in Ghana. 2. To ensure effective and efficient Inter-country coordinating mechanism for NTD programming, partnerships, and coordination. 3. To update and align the existing Communication & Advocacy Strategy with the NTDP Financial Sustainability plan.

2.4.3 Programme Strategic Agenda Logic Map

The below figure maps out logically how the programme is working and how it is inter-related. For example of logic map see the WHO Thirteenth General Programme of Work 2019–2023 (GPW 13) Page 4[41]

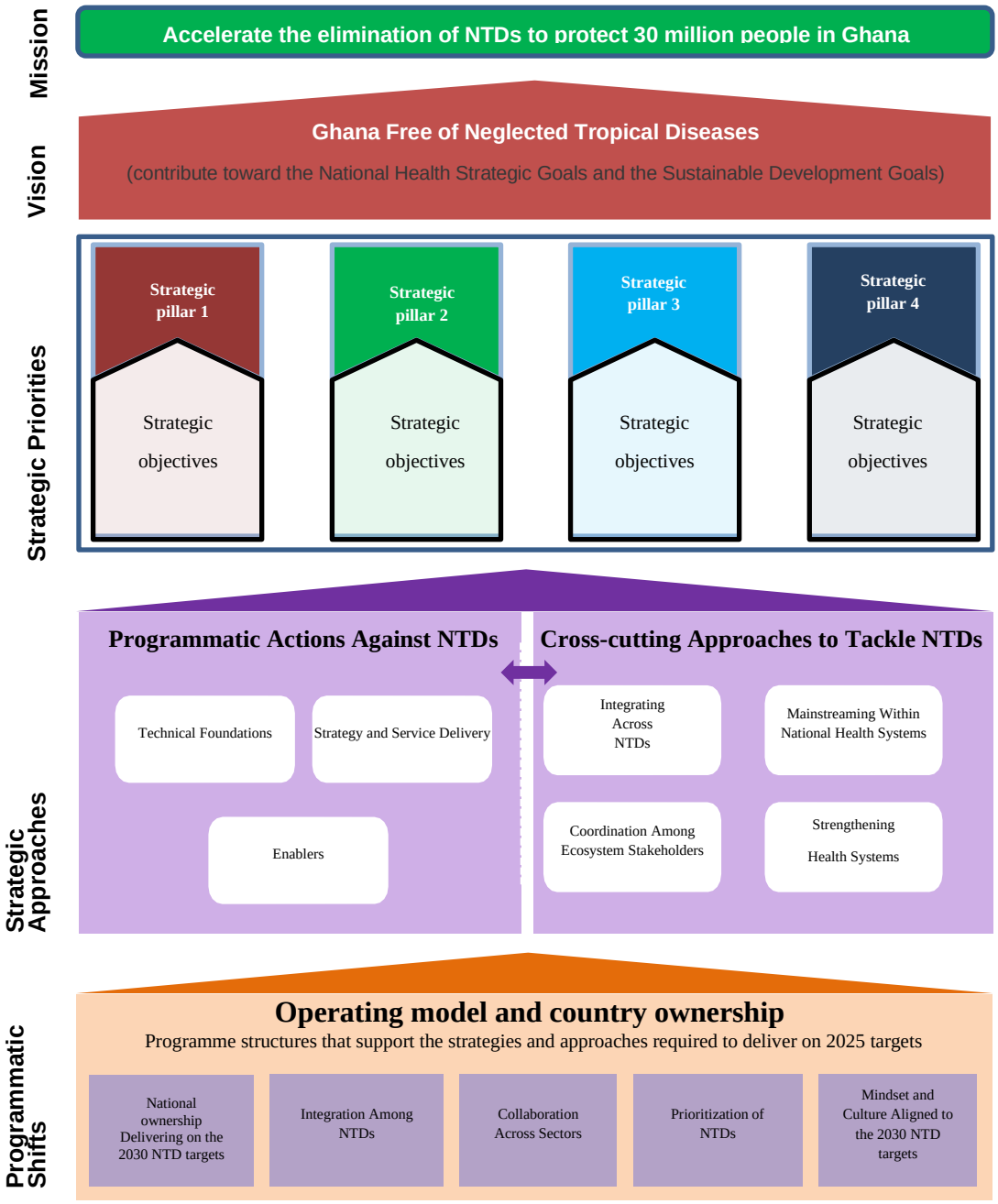

Figure 26: Programme Strategic Agenda Logic Map Template

[41] WHO. Thirteenth General Programme of Work 2019–2023. Page 4. Available https://apps.who.int/iris/bitstream/handle/10665/324775/WHO-PRP-18.1-eng.pdf

PART 3

Implementing the Strategy: NTD Operational Framework

In line with the 2021 - 2030 NTD Global Roadmap, this strategic plan is geared towards ensuring three fundamental shifts in the approach to tackling NTDs: **first**, increase accountability for impact by using impact indicators instead of process indicators, as reflected by the targets and milestones in Part II and accelerate programmatic action; **secondly**, move away from siloed, disease-specific programmes by mainstreaming programmes into national health systems and intensifying cross-cutting approaches centred on the needs of people and communities: and **thirdly**, change operating models and culture to facilitate greater ownership of the NTD programme by the country.

Section 3.1: Strategic Initiatives and Strategic Activities

Table 15: Strategic Pillars - Accelerating programmatic action

Strategic Objective	Strategic activities	Time frame	Resources needed
Enhance monitoring of national NTD programme performance and outcome.	Include assessment of the participation of minority groups in project monitoring and evaluations	2021 - 2025	NTDP team and partners, data collectors, venues, refreshments, Transport, stationery, Assessment tools
	Strengthening NTD Performance • Mapping of Scabies and yaws • Capacity building of the NTD national level personnel • Strengthen advocacy: advocate for senior managers meeting to include NTDs in their review meetings. • Resource mobilization • Training on M&E, not only at the national level but also at the regional and sub-regional levels. Include NTD indicators into the Regional Holistic assessment tool	2021 - 2025	NTDP team and partners, data collectors, venues, refreshments, Transport, stationery,

	Supervision of NTD activities	2021 - 2025	Personnel, Drivers, District staff, Transport, Vehicle maintenance
	Review Meetings	2021 - 2025	National, regional, district participants, Drivers, Transport, Venue & refreshment
	Support visits for all NTDs	2021 - 2025	Monitors, Drivers, Transport,
Strengthen the surveillance of NTDs and strengthen the response and control of epidemic prone NTDs.	Strengthen surveillance of PCT and case management NTDs • Refresher training on NTDs DHIMS forms for the national level which should cascade downstream. • Desk review of NTDs data on a monthly basis by desk officers. • Cross-border meetings	2021 - 2025	Supervisors, monitors, Technicians, Drivers, Regional staff, District staff, Transport, Vehicle maintenance, Logistics/materials
	Strengthen response and control of epidemic prone NTDs • Capacity building for labs • Capacity building for health workers	2021 - 2025	
Identify individuals and groups that are likely to be left out in NTD interventions application and target them with interventions	• Conduct LNOB risk assessment to identify minority and marginalized groups that are likely to be left out in NTD elimination interventions • Involve minority groups in project planning and implementation • Develop LNOB strategy for reaching marginalised and minority groups • Train relevant staff in LNOB implementation • Disaggregation of data (by sex, age and if possible disabilities) at all levels.	2021-2025	Supervisors, monitors, Technicians, Drivers, Regional staff, District staff, Transport, Vehicle maintenance, Logistics/materials
Support operational research, documentation and evidence to guide innovative approaches to NTD programme interventions	Identify and conduct operational research on NTDs for effective programme implementation • Research on mental health, socio-economic impacts and quality of life vis a vis CM-NTDs. • Research on the LF 'hotspots' • Post-MDA coverage survey	2022 - 2025	Facilitators, Participants, Venue & refreshment

	• Quality assessment surveys • Onchocerciasis epidemiological and entomological surveys • STH and schistosomiasis impact assessment studies. • Undertake post trachoma Elimination surveillance		
Establish integrated data management systems and support impact analysis for NTD as part of the global NTD data management system and Global NTD Plan.	Strengthen integrated data management system • Data management training for NTD Regional & District teams. • Follow up visits • Data verification and validation • Review meeting on data issues. • Quarterly Technical Data review with NTD staff	2021 - 2025	Facilitators, Participants, Venue & refreshment, Equipment/materials
	Organize training of health workers on NTD indicators to facilitate reporting	2021 – 2025	Facilitators, Participants, Venue & refreshment, Equipment/materials
To develop integrated multi-year strategic plans and develop gender-sensitive annual operational plans for the control, elimination, and eradication of targeted NTDs.	Facilitate the development of gender sensitive multi-year NTD plans at regional and district levels • Capacity building for health staffs on gender sensitive issues	2021	Personnel, Transport, Equipment/materials
Enhance resource mobilization approaches and strategies at national and sub-national levels for NTD interventions	Conduct in-country fund raising for the control and elimination of NTDs • Workshop on resource mobilization • Advocacy meetings with champions of industry • Proposal development meetings	Yearly	Personnel, Transport Communication
	Improve international partnership for NTD support in Ghana • Advocate for improve support for NTDs at international conferences, seminar etc…	Yearly	

Strengthen the integration and linkages of NTD programme and financial plans into sector-wide and national budgetary and financing mechanisms	Ensure availability of budget lines for NTD control and elimination at national, regional and district level plans • Prepare budget lines for NTD control and elimination at national, regional and district level plans • Advocacy meetings • Meeting with parliament select committee on health	Yearly	Personnel Transport Equipment/materials
	Develop integrated plans and budgets for all the NTDs in Ghana • Preparation of master plan 2026-2030 • Preparation of annual integrated plan (TIPAC)	Yearly	
	Develop an advocacy plan for resource mobilisation • Workshop on advocacy plan	2021	
	Review and update the current donor mapping and domestic funding tracking for NTDs • Review meeting on the current donor mapping and domestic funding	2021	
Support disease programmes to elaborate guidelines and tools to guide effective policy and programme implementation.	Develop and print integrated NTD protocols and guidelines for the control of NTDs in Ghana	2021 - 2022	Personnel Transport Equipment/materials
	Conduct training meetings for health workers in the use of NTD tools and guidelines	2021 - 2022	
	Disseminate NTD tools and guidelines at all health facilities	2021 - 2023	
Scale up an integrated preventive chemotherapy interventions.	Conduct mass drug administration (MDAs) for PCT diseases (LF, ONCHO, STH and Schisto).	Q2 – Q4, yearly	Personnel, Transport Equipment/materials
	Development and Printing of IEC and BCC Materials for MDA	Q1, yearly	Funds
	Transportation of Medicines and Logistics to endemic regions and districts	Q2 – Q4, yearly	Personnel, Transport Equipment/materials
Scale up integrated case-management-based diseases interventions (Yaws, BUD, Rabies, HAT, Leishmaniasis etc) including LF morbidity control	Train key health staff for effective identification and management of NTD morbidity cases	2021	Personnel, Transport Equipment/materials
	Manage active BUD, leprosy and lymphoedema, etc… cases by health workers and communities	2021 - 2025	Surgical supplies & instruments, wound dressing materials, drugs
	Scale up training of HW on Case and Contacts treatment of Yaws and leprosy at all levels	2021 - 2025	Trainers/Facilitators Participant from Districts, Transport,

			Venue, Refreshments, Stationery and Supplies
	Treatment of CM NTD cases and contacts at facilities and communities/schools (Sub District Level)	1Day/week for 40 weeks per year	Fuel, Transport and Allowance for Health workers, Supplies
Strengthening integrated vector management and environmental measures for targeted NTDs.	Build capacity for entomological surveillance of Onchocerciasis • Training of regional staff	2021 - 2025	Personnel, Transport Equipment/materials
	Build capacity for epidemiological surveillance of Lymphatic filariasis, schistosomiasis and STH	2021 - 2025	Personnel, Transport Equipment/materials
Strengthen capacity at national level for NTD programme management and implementation.	Train staff in planning and monitoring of integrated NTD control program	2021 - 2025	Personnel, Transport Equipment/materials
Strengthen high level engagements	Build capacity for advocacy at national and international levels	2021 - 2025	Personnel, Transport Equipment/materials
Enhance monitoring of national NTD programme performance and outcome.	Strengthening NTD Performance Evaluation	2021 - 2025	Facilitators, Participants, Stationery, Drivers Transport, Venue & refreshment
	Supervision of NTD activities	2021 - 2025	Personnel, Drivers, District staff Transport, Vehicle maintenance
	Review Meetings	2021 - 2025	National & Regional participants Drivers, Transport, Venue & refreshment
	Support visits for all NTDs	2021 - 2025	Personnel, Transport Equipment/materials
	Yearly annual reviews and development of work plans	2022 - 2025	Personnel, Transport, materials
Strengthen the surveillance of NTDs and strengthen the response and control of epidemic prone NTDs. Strengthen the surveillance and response to NTDs ermark for elimination and eradication of NTDs and control of epidemic prone NTDs & earmarked for elimination and eradication (leprosy& Yaws).	Strengthen surveillance of PCT and case management NTDs	2021 - 2025	Supervisors, Technicians, Nutritionist Drivers, District staff, Transport Vehicle maintenance, Logistics/materials
	Strengthen response and control of epidemic prone NTDs • Advocate for inclusion in the GWER • Training for the SHEP • Refresher training for CBSV	2021 - 2025	
Support operational research, documentation and evidence to guide innovative approaches to NTD programme interventions	Identify and conduct operational research on NTDs for effective programme implementation	2021 - 2025	Personnel, Transport Equipment/materials, Venue & refreshment
Strengthening monitoring of national NTD programme performance and outcome	Sensitization of health workers on the importance of pharmaco-vigilance	2021 - 2025	Personnel, stationery, transport,

	• Training of HWs on pharmaco- vigilance		communication, venue
	Monitoring pharmaco-vigilance activities	2021 - 2025	
Strengthen surveillance during and post interventions of NTDs within PHC	Post intervention treatment surveillance (LF) Developed or adopt integrated (post intervention) surveillance tools	2021 - 2025	Personnel, per diem, stationery, transport, communication, venue
Support inter-sectoral collaboration mechanisms and the identification of indicators to measure progress	Organize regular meetings with the members of the collaborative platforms to monitor progress	2021 - 2025	National participants, transport, venue
Support the development of a training and career development plan for the personnel involved in NTDs	Conduct a mapping analysis to identify training needs for the NTD personnal at different levels of the health system	2021 - 2025	Personnel
Support the updating of job descriptions of human resources dealing with NTD control and elimination	Conduct a mapping analysis of the existing positions in NTD and develop a written description of the different roles	2021	Personnel

Section 3.2: Toward Programme Sustainability: Intensifying Coordination and Partnerships

Given the ambition of the NTD programme, many stakeholders—both internal and external — will be required to align their actions and play a role if these goals are to be achieved. Advocacy is a powerful tool that can be used to bring stakeholders together to execute the Master Plan and enable the achievement of NTD programme goals by 2025. Accordingly, advocacy activities will be undertaken at all levels to increase awareness of NTDs and win support for the programme among influential government decision makers, public opinion leaders, impacted communities, and funding partners. An Advocacy and Communications Strategy document has been developed and details the NTD programme's advocacy and communications objectives, action plans, monitoring and evaluation framework, and cost estimates for advocacy activities.

The strategy lays out action plans and associated guidance designed to target key partners and advocates of the NTD programme and ultimately embed the programme's goals into broader government and non-governmental objectives and decision-making. By identifying key decision makers and leveraging influential partners, advocacy serves a greater purpose than basic influence; when done effectively, advocacy can help the NTD programme to advance through the "sustainability continuum", moving the programme toward greater integration across levels, government departments, and sectors and ultimately, toward greater assurance of funding and financial sustainability.

The NTD Sustainability Continuum (Figure 14) is a means to measure the progress of the NTD programme in terms of long-term sustainability as the programme seeks to achieve its goals of NTD control, elimination and post-elimination care and surveillance. The continuum ranges from stand-alone NTD activities to full integration with the broader health system. The table 14 below details the strategies to be employed by the programme.

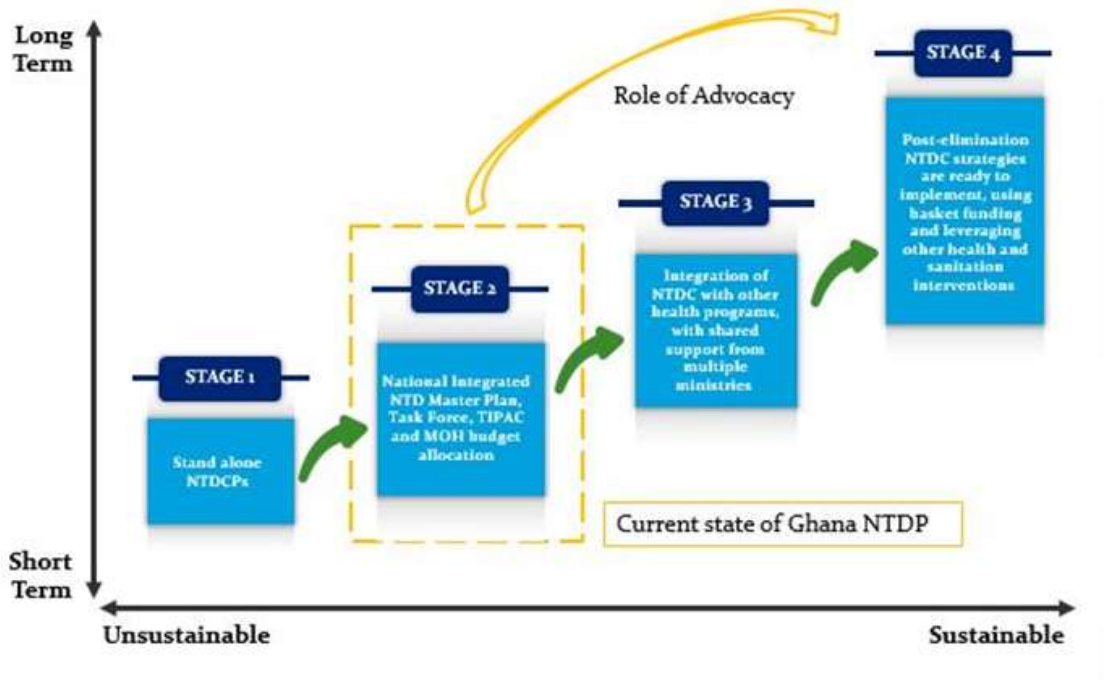

Figure 27: NTD Programme Sustainability Continuum

Table 16: Sustainability strategies

Plan topic	Strategic Objective	Desired Change(s)	Advocacy Objective(s)	Key Change Agents/ Audience
Increase visibility and commitment within health sector	Ensure the capacity of the Government of Ghana to effectively and efficiently scale up and deliver all NTDs interventions in Ghana	• The GOG (specifically, the MOH) increases financial commitments to NTDP, including PCT and case management as budget line items • The GOG (specifically, the MOH) increases the number of human resources devoted to the NTDP • The GHS/Director of Public Health (DPH) and Director of Policy, Planning, Monitoring and Evaluation (PPME) add NTDP activities (i.e., MDAs) to the yearly GHS calendar • GHS increases operational budgets to the NTDP (prior to submission to MOH) • NTDP develops program budget with inputs from the RHAs and DHAs to determine resource allocation	• Enhance visibility and profile of NTDP among health sector in order to empower key decision makers to make financial and programmatic decisions that support NTDP efforts	GHS/Director General and Deputy Director General; GHS/DPH; GHS/Director of PPME; GHS Regional Health Administrations (RHAs); GHS District Health Administrations (DHAs)
Capacity Building	Scale up access to interventions, treatment and system capacity building	• MoH includes integrated NTD and WASH in the curriculum of institutions • GHS provides clear job descriptions for NTD officers • GHS develop and implement career development plan for the personnel involved in NTDs • GES integrates NTD into WASH education in schools • MoH provides relevant equipment for NTD elimination	• Strengthen NTD programmes at all levels of the health system	GHS/Director General and Deputy Director General; GHS/DPH; Director of PPME; Health Program Managers; GHS WASH Program Managers; SHEP WASH Officers; Partners/Donors

Plan topic	Strategic Objective	Desired Change(s)	Advocacy Objective(s)	Key Change Agents/ Audience
Greater integration and collaboration with health sector programming, including WASH	Scale up access to interventions, treatment and system capacity building	• NTDP activities are coordinated with other government health and WASH efforts • NTDP managers define opportunities and communication channels to integrate and coordinate NTD activities with other health and WASH efforts • NTD-WASH data merge system created to serve as an advocacy tool for WASH and NTD integration and planning • Integrated IE&C materials created for NTDs and WASH • Coordination mechanism established at national and subnational levels for planning, resource mobilization and advocacy	• At the national level: Influence DPH, DPPME and other decision-makers to integrate or coordinate NTD programming with other health and WASH programming where it makes sense. • At the sub-national level: Influence regional ministries to integrate or coordinate NTD programming with other health and WASH programming where it makes sense.	GHS/Director General and Deputy Director General; GHS/DPH; Director of PPME; Health Program Managers; GHS WASH Program Managers; SHEP WASH Officers; Partners/Donors
Increase community participation in NTD programming	Scale up access to interventions, treatment and system capacity building	• At-risk populations participate in MDAs and other program activities because they see the value of program interventions • Community mobilization and sensitization strengthened to ensure community ownership	• Identify, convince, and empower "social mobilizers" who can influence behaviors and increase the uptake of PCT NTD interventions by actively serving as partners/spokespeople in order to promote MDA program and increase community participation in program interventions • Promote disaggregation of data at all levels in the NTD Programmes	Health workers, TV and film celebrities; Athletes and sports teams; Religious leaders; Impacted community leaders; Impacted community elders and family heads; GHS RHAs and DHAs; NTD Ambassador; Ghana Education Service/School Health Education Unit; SHEP Coordinators (Region and District); School-based health promoters; SHEP WASH Officers

Plan topic	Strategic Objective	Desired Change(s)	Advocacy Objective(s)	Key Change Agents/ Audience
Improve integration of monitoring and evaluation	Enhance NTD monitoring and evaluation (M&E), surveillance and operations research (Establish integrated data management system and support impact analyses for NTD as part of the global NTD data management system and plan)	• Director of PPME, RHDs, DHDs incorporate NTDs into their regular M&E activities • Ongoing country Demographic Health Survey (DHS) includes questions about NTDs • Periodic stakeholder assessments, and performance reviews instituted	• Influence DPH and Director of PPME to integrate NTD M&E into ongoing health M&E efforts • Promote integrated M&E with GHS and other stakeholders to ensure and sustain NTD data capture	GHS/Director General and Deputy Director General; Director of PPME; DPH; GHS RHAs and DHAs; USAID
Greater regional ownership, awareness and integration	Enhance planning for results, resource mobilization and financial sustainability of national NTDP	• Regional Ministers/Directors of Health recognize the importance of addressing NTDs within their populations • NTD programming is increasingly coordinated with related programming at regional levels • Regional teams empowered to plan and implement NTD activities independently. • Regional Health Directorates made more accountable to prioritise, and respond to NTD challenges in their regions	• Increase awareness of opportunities to integrate or coordinate NTD programming across different sectors at regional level · Integrate planning between Regional Ministers/Directors of Health and non-health Regional Ministers/Directors • Increase awareness among non-health Regional Ministers/Directors related to the impact of NTDs on other programs that they may care about • Communicate, through national channels, the impact of NTDs on other programs (such as school attendance, productivity, etc.), across regions	GHS/Director General and Deputy Director General; DPH; Regional Ministers/Directors of Health; non-health Regional Ministers/Directors ; Ministry of Local Government; Regional LGAs; Metropolitan, municipal, and district assemblies; Partners/Donors

Plan topic	Strategic Objective	Desired Change(s)	Advocacy Objective(s)	Key Change Agents/ Audience
Increase resource mobilization	Enhance resource mobilization approaches and strategies at national and regional levels for NTD interventions	• Non-health Regional Ministers/DCEs source or allocate funds to help RHDs and DHDs fill NTDP gaps • External partners commit funds or implementation resources to help fill NTDP gaps • NTD resource mobilization unit empowered to raised local funding for NTDs • Resource mobilization subcommittee of the ICCC generates local funding for NTD elimination	• Articulate and promote value of NTDPs among targeted public and private stakeholders to increase awareness of possible returns on NTD investment • Increase Regional Minister/Director of Health awareness of level of NTDP resources available to support RHA and DHA programming for NTDs and the remaining funding gaps • Increase advocacy on behalf of Regional Ministers/Directors of Health to mobilize resources for the NTDP at the regional level (outside of the GHS budget)	GHS/Director General and Deputy Director General; DPH; Regional Minsters/Directors of Health; GHS RHAs and DHAs; non-health Regional Ministers/Directors ; Regional Coordinating Councils; DCEs; Metropolitan, municipal, and district assemblies
Promote guidelines and policies	Strengthen NTDP capacity at both national and regional levels for sustainability planning and resource mobilization, strategic budgeting and public financial management (PFM) reform	• Strengthen regional and district leaders to provide inputs to inform national NTD policies and promote guidelines in their own health programming • NTD policy for Ghana developed	• Empower RHAs and DHAs to promote and provide feedback on NTD guidelines and policies in their own programming • Promote NTD guidelines and policies to RHAs/DHAs in a way that articulates the broader impact in their regions/districts	GHS/Director General and Deputy Director General; DPH; Director of PPME; GHS RHAs and DHAs
Enhance vector management	Strengthen integrated vector management and environmental measures for targeted NTDs	• Malaria program effectively integrates NTD vector management and environmental considerations into policymaking and programming	• Increase awareness of National Malaria Control Program (NMCP) of efficiencies to be gained from integrating vector management, specifically mosquito control, between NTDP and NMCP through policy development, programming, and annual plans	NMCP

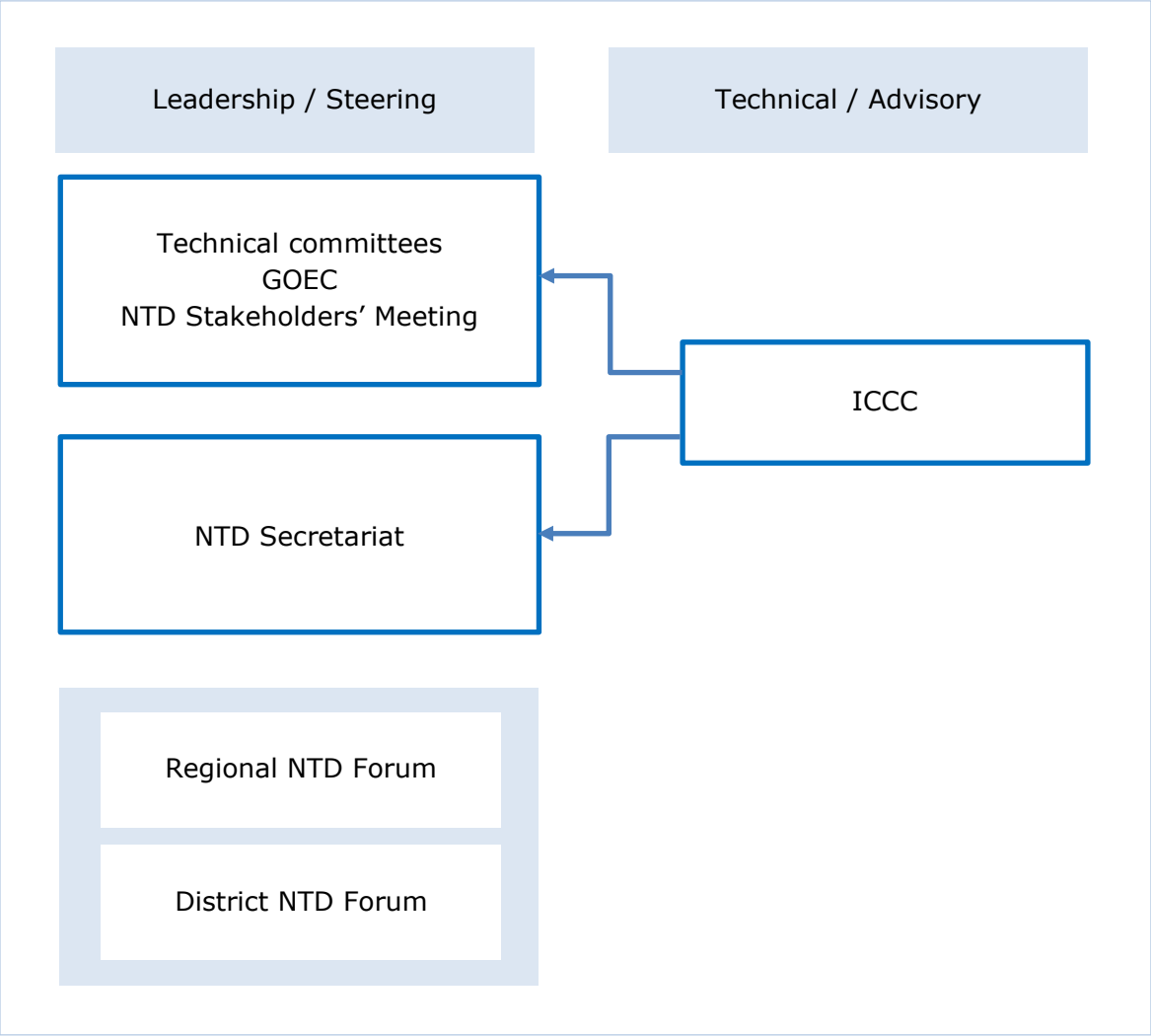

Figure 28: Programme coordination mechanism

Table 17 below lists the partners involved in NTD control activities in Ghana

Table 17. Partnership Matrix

Region	NTDs (List)	Veterinary (List)	WASH (List)	IVM (List)	One-Health (List)	Education (List)	Malaria (List)
Ashanti	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid			Unicef, MoE	MOH
Brong Ahafo	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid			Unicef, MoE	MOH
Bono East	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid, VRA			Unicef, MoE	MOH
Ahafo	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid			Unicef, MoE	MOH
Central	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid			Unicef, MoE	MOH
Eastern	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid, VRA			Unicef, MoE	MOH
Greater Accra	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid			Unicef, MoE	MOH
Northern	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid, VRA			Unicef, MoE	MOH
Savannah	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid, VRA			Unicef, MoE	MOH
North East	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid			Unicef, MoE	MOH
Upper East	USAID, Sightsavers, WHO, Aim	VSD-MOFA	WVI, WaterAid			Unicef, MoE	MOH

	Initiative, Deloite						
Upper West	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid			Unicef, MoE	MOH
Volta	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid, VRA			Unicef, MoE	MOH
Oti	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid, VRA			Unicef, MoE	MOH
Western	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid			Unicef, MoE	MOH
Western-North	USAID, Sightsavers, WHO, Aim Initiative, Deloite	VSD-MOFA	WVI, WaterAid			Unicef, MoE	MOH

Section 3.3: Assumptions, Risks and Mitigations

Tables 18 and 19 provide the risk assessment and mitigation strategies. For each risk identified in Table 18, a risk score and appropriate mitigation strategies are identified. The risk score is categorized into minor, moderate, major and severe. The mitigation step for each risk is defined in Table 19.

Table 18. Risk Criteria and Assessment

Potential Risk	Before risk mitigation			Risk Mitigation Step	After risk mitigation		
	Likelihood of occurrence	Impact	Risk Score		Likelihood of occurrence	Impact	Score
	Certain =5 Likely =4 Possible =3 Unlikely =2 Rare =1	Severe =5 Major =4 Moderate =3 Minor =2 Insignificant =1	Likelihood x Impact		Certain =5 Likely =4 Possible =3 Unlikely =2 Rare =1	Severe =5 Major =4 Moderate =3 Minor =2 Insignificant =1	Likelihood x Impact
Risk Type							
Funding	3	5	15	Control	3	3	9
Integration	4	3	12	Avoid	3	2	6
Sustainability	3	4	12	Share	3	3	9
Effectiveness of interventions	2	3	6	Monitor	2	2	4
Data management and tools	3	3	9	Control	2	2	4
Human resource	3	4	12	Control	3	2	6

Risk Score (Likelihood x Impact)	
19 – 25	Severe
13 – 18	Major
7 – 12	Moderate
0 – 6	Minor

Table 19: Steps to mitigate risk	
Avoid	Change plans to circumvent the problem
Control	Reduce threat impact or likelihood (or both) through intermediate steps
Share	Outsource risk (or a portion of the risk) to a third party or parties that can manage the outcome.
Accept	Assume the chance of the negative impact
Monitor	Monitor and review process in which risk management is in place

Section 3.4. Performance and Accountability Framework

In the table 20 below some examples of strategic objectives, performance indicators, targets and date are provided.

Table 20. Performance Indicators:

Strategic Objective	**Performance indicators**	**Target**	**Date**
Enhance monitoring of national NTD programme performance and outcome.	National Meeting reports	1/year	Yearly
	NTD Support visit reports	14/year*	Yearly
Strengthen the surveillance of NTDs and strengthen the response and control of epidemic prone NTDs.	Surveillance reports per year	14/year*	Yearly
Support operational research, documentation and evidence to guide innovative approaches to NTD programme interventions	Number of operational research conducted	14 research, 1 for each NTD	2022 - 2025
Establish integrated data management systems and support impact analysis for NTD as part of the global NTD data management system and Global NTD Plan.	NTD data updated yearly for each disease		2021 - 2025
To develop integrated multi-year strategic plans and develop gender-sensitive annual operational plans for the control, elimination, and eradication of targeted NTDs.	Strategy document	1	2021
Identify individuals and groups that are likely to be left out in NTD interventions application and prioritise them	Annual report include information on the participation of identified minority and marginalised groups in NTD interventions	1/year	Yearly

Enhance resource mobilization approaches and strategies at national and sub-national levels for NTD interventions	Funding raised for yearly activities	At least 80%	Yearly
Support disease programmes to elaborate guidelines and tools to guide effective policy and programme implementation.	Number of integrated NTD guidelines developed	2 (1 PCT, 1 CM NTD)	2021
	Number of health workers trained in the use of NTD tools and guidelines	1600 (100 per region)	
Scale up an integrated preventive chemotherapy, including access to LF, STH, Onchocerciasis, Schistosomiasis and trachoma interventions.	Number of people treated	All individuals in endemic IUs	Yearly
Scale up integrated case-management-based diseases interventions (Yaws, BUD, Rabies, HAT, Leishmaniasis etc) including LF morbidity control	Number of people treated	All individuals identified with disease	Yearly
Strengthening integrated vector management and environmental measures for targeted NTDs.	Number of people trained for entomological surveillance of NTDs	35**	2022
Strengthen capacity at national level for NTD programme management and implementation.	Number of personnel trained in planning and monitoring of integrated NTD control program	35**	2021
Strengthen the surveillance of NTDs and strengthen the response and control of epidemic prone NTDs.	Number of personnel trained in surveillance of PCT and case management NTDs	35**	2022
Strengthening monitoring of national NTD programme performance and outcome	Number of personnel trained in on the importance of pharmaco-vigilance	35**	2022

* 1 report per NTD (except Guinea worm) in Ghana, and 1 overall report on all NTDs. ** 2 in each of the 16 regions and 3 at the national level.

PART 4

Budgeting for Impact: Estimates and Justifications

The multi-year strategic plan of action addresses the following strategic priorities namely: strengthen government ownership, advocacy, coordination and partnership, enhancing planning for results, resource mobilization and financial sustainability of the NTD programme; scale up access to interventions, treatment and system capacity building; enhance NTD monitoring and evaluation, surveillance and operational research. There are specific objectives under each of these four priorities with corresponding activities.

Strategic Priority 1: Enhance planning for results, resource mobilization and financial sustainability of the NTD programme

Sustained funding is necessary is necessary for successful control of NTDs in the country. There is a need to galvanize other government agencies' and corporate bodies' interest in controlling NTDs. Regular planning and review meetings to involve partners will be carried to ensure stakeholder participation. These meetings will also be for a for dissemination of progress being made and lessons learnt.

Strategic Priority 3: Scale up access to interventions, treatment and system capacity building

Implementation of control intervention will be carried out based on the master plan using a coordinated and integrated approach. For example, during mass drug administration, there will also be case search for the NTDs that manifest with skin condition. Training of health personnel in the management of NTDs will be integrated and this will be rolled out to the community level.

Strategic Priority 4: Enhance NTD monitoring and evaluation, surveillance and operational research.

A system of integrated monitoring and evaluation will be put in place to keep track of activities and ensure milestones are being achieved. This will involve field activities, improving surveillance, pharmaco-vigilance monitoring and operational research to identify innovations that will support implementation of activities. Resources needed for the M & E activities will

include personnel, transport, monitoring tools, capacity building. Dissemination of findings to improve NTD control activities will be carried out.

Strategic Priority 4: Strengthen government ownership, advocacy, coordination and partnership

Government leads the process in disease control activities and harnesses the contribution of partners to control, reduce their prevalence or eliminate them completely. Coordinating mechanism therefore have to be put in place to facilitate implementation of activities. These include enhanced human resource capacity, strengthened advocacy for NTD, develop efficient communication system, infrastructural development and equipment and improving access to health care. There is a need to set up technical working group that will ensure effective policy implementation of NTD strategic plans at all levels of health service delivery.

Below is a summary of the budget for the implementation and considerations for the activities identified in the master plan.

Table 21. Summary budget

	Strategic Priority	2021		2022		2023		2024		2025		Total 5 years	
		Cost	Gap	Cost	Gap	Cost	Gap	Cost	Gap	Cost	Gap	Cost	Gap
	Drug cost	24,706,962	0	18,282,955	- 0	16,778,527	- 0	16,504,900	0	17,657,858	0	93,931,202	- 0
1	Resource Mobilization	38,448,040	38,448,040	1,133,987	1,133,987	1,229,533	1,229,533	501,125	501,125	406,250	406,250	41,718,935	41,718,935
2	Scale-up interventions (PC diseases)	41,156,951	41,156,951	34,525,086	34,525,086	45,042,224	45,042,224	34,981,653	34,981,653	51,473,051	51,473,051	207,178,966	207,178,966
	Scale-up interventions (CM diseases)	43,664,064	43,664,064	33,898,408	33,898,408	35,593,328	45,344,826	42,288,503	47,612,067	40,667,094	49,992,671	196,111,398	220,512,036
	Scale-up interventions (IVM, sanitation)	474,010	474,010	798,028	798,028	331,577	130,206,611	348,156	128,533,509	359,098	145,298,782	2,310,868	405,310,939
3	M & E, Research	45,124,839	45,124,839	43,185,549	43,185,549	45,344,826	45,344,826	47,612,067	47,612,067	49,992,671	49,992,671	231,259,952	231,259,952
4	Coordination, Partnership & Advocacy	3,854,130	3,854,130	2,661,515	2,661,515	2,665,123	2,665,123	2,802,004	2,802,004	2,400,617	2,400,617	14,383,389	14,383,389
	Total cost - PC diseases (with drug)	**109,814,423**	**85,107,461**	**76,697,580**	**58,414,625**	**86,606,281**	**134,765,270**	**77,118,229**	**124,706,006**	**95,710,227**	**150,522,211**	**445,946,740**	**553,515,573**
	Total cost - PC diseases (w/o drug)	**85,107,461**	**85,107,461**	**58,414,625**	**58,414,625**	**69,827,754**	**134,765,271**	**60,613,329**	**124,706,006**	**78,052,369**	**150,522,211**	**352,015,538**	**553,515,574**
	Total cost - CM diseases	**87,614,574**	**87,614,574**	**57,787,947**	**57,787,947**	**60,378,857**	**135,067,872**	**67,920,179**	**137,336,420**	**67,246,413**	**149,041,831**	**340,947,970**	**566,848,644**

Capital cost and annual compensation of national personnel

Item	2021		2022		2023		2024		2025		Total 5 years	
	Cost	Gap	Cost	Gap	Cost	Gap	Cost	Gap	Cost	Gap	Cost	Gap
Capital cost + Annual compensation	2,022,720	2,022,720	1,196,560	1,196,560	475,500	475,500	111,400	111,400	100,000	100,000	3,906,180	3,906,180

PC DRUG NEED AND GAP for PC diseases

PC Drug	2021		2022		2023		2024		2025		Total 5 years	
	Need	Gap	Need	Gap	Need	Gap	Need	Gap	Need	Gap	Need	Gap
Ivermectin (3mg tablets)	23,111,514	0	16,701,579	- 0	15,726,722	- 0	16,088,436	0	16,458,470	0	88,086,721	- 0
DEC (100mg tablets)	-	-	-	-	-	-	-	-	-	-	-	-
Praziquantel (600mg tablets)	19,476,260	-	19,428,149	- 0	12,800,722	0	4,850,963	- 0	14,629,357	- 0	71,185,450	- 1
Albendazole (400mg tab)/Mebendazole (500mg	945,428	-	967,173	- 0	536,420	- 0	548,757	0	561,379	- 0	3,559,157	- 0
Albendazole (400mg tab)/Mebendazole (500mg	10,830,785	-	7,866,039	0	8,046,958	0	8,232,038	0	8,421,375	- 0	43,397,195	0
TEO (5mg tubes)	-	-	-	-	-	-	-	-	-	-	-	-
Azithromycin POS (30ml bottles)	-	-	-	-	-	-	-	-	-	-	-	-
Azithromycin (250mg tablets)	-	-	-	-	-	-	-	-	-	-	-	-

Annexe

Annex 1: Steps in designing/reviewing a national NTD Master Plan

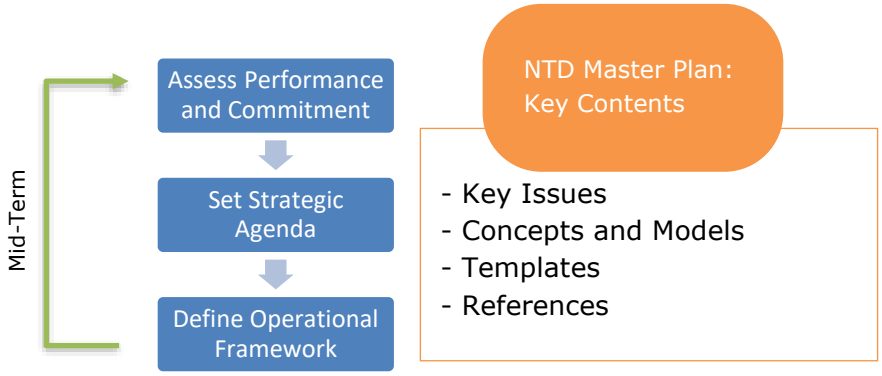

Figure A1: NTD Master Plan Key Contents

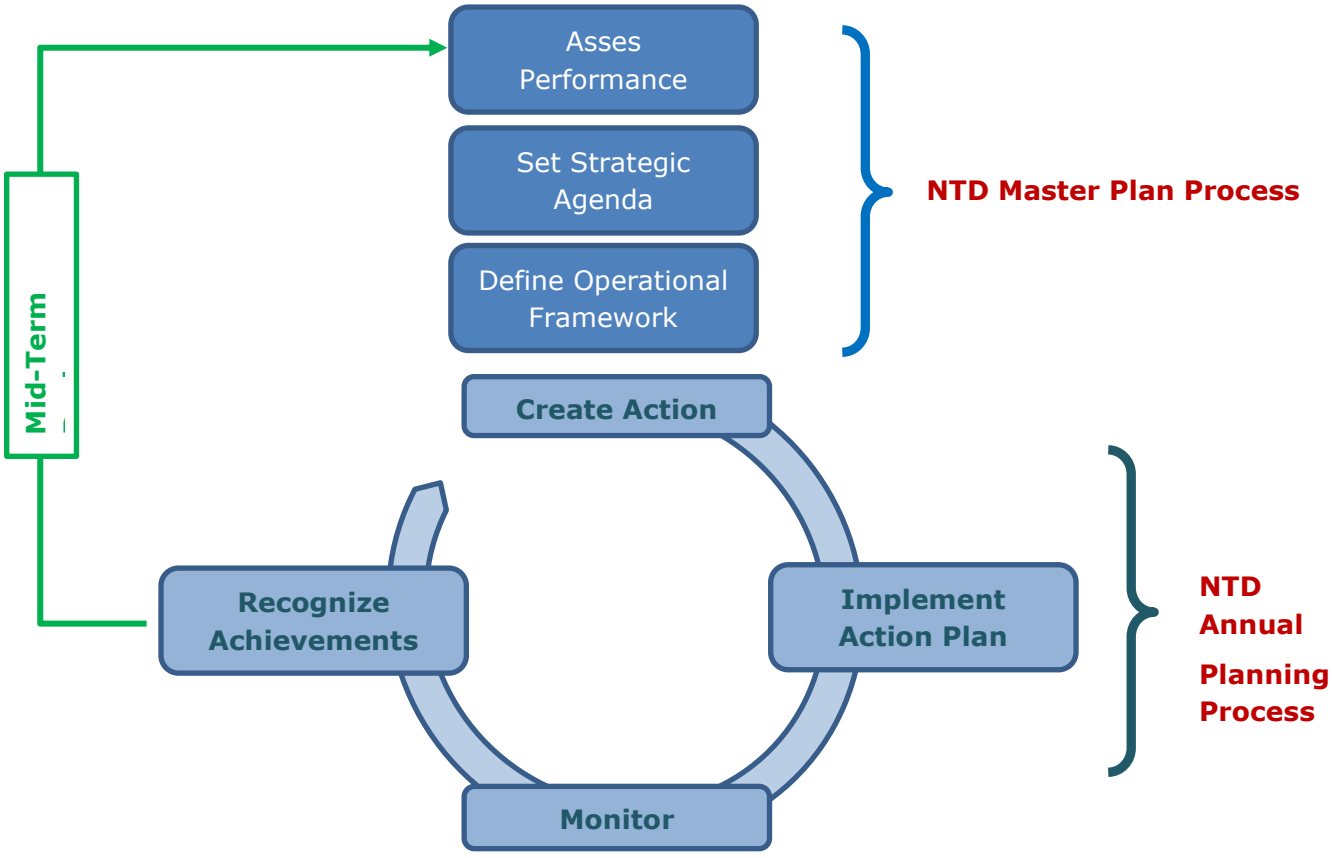

Figure A2: NTD Master Plan: Process and Management Cycles

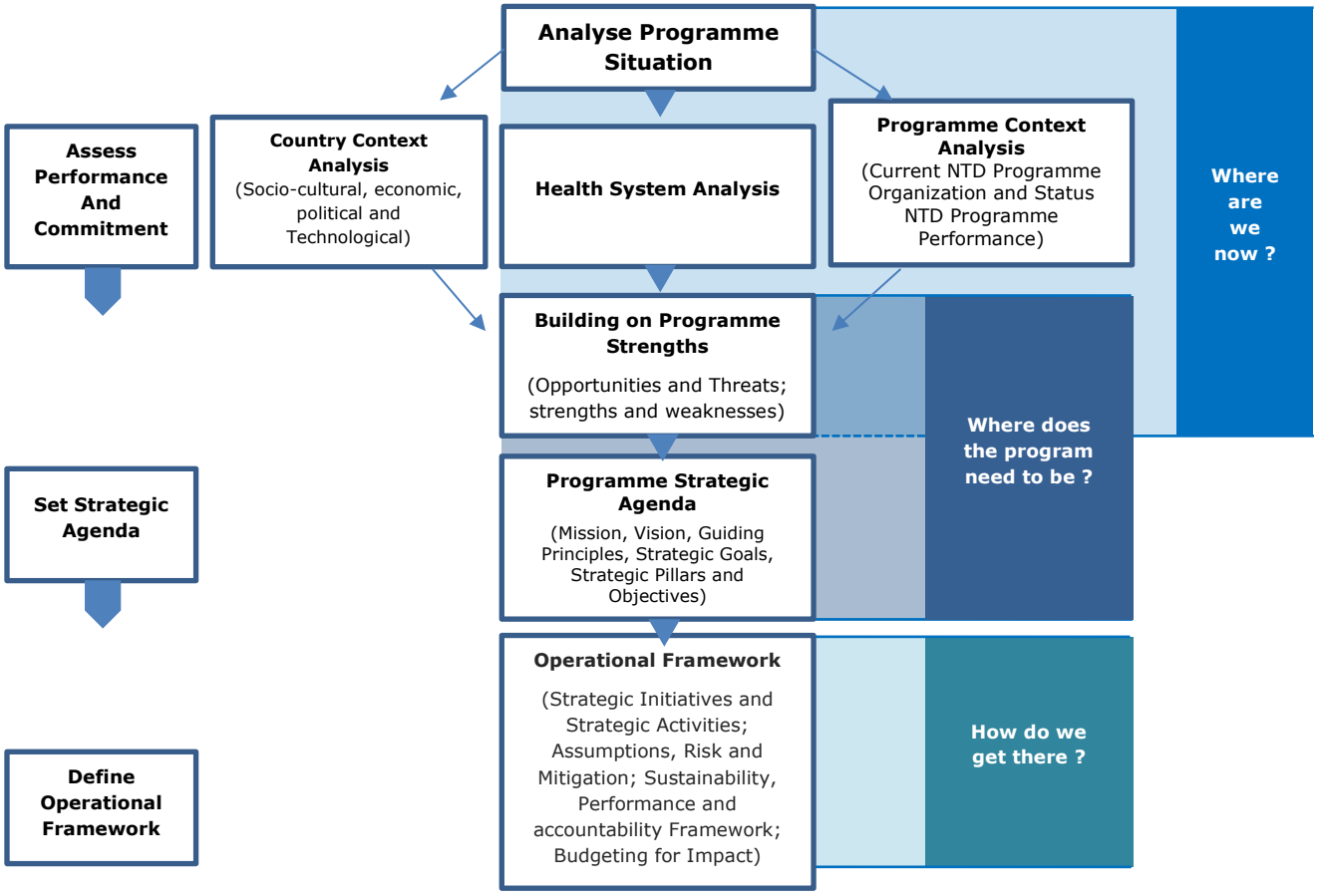

Figure A3: NTD Master Plan Process