

# THE STATE OF ERITREA

# **Progress in the Health Sector**



## Contents

Acr	onyms	3
1.	Background	4
2.	Reducing Maternal and Child Mortality	4
3.	Controlling Communicable Diseases	8
3	.1 HIV/AIDS	8
3	3. 2 Tuberculosis (TB)	11
3	. 3 Malaria	13
4.	Non Communicable Diseases Control	16
5.	Universal Health Coverage	17
6.	Clean Water and Sanitation	21
7.	Health Workforce	23
Ref	erences	25

## Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ECOSOC	Economic and Social Council (United Nations)
HIV	Human Immunodeficiency Virus
HSSDP	Health Sector Strategic Development Plan
MDGs	Millennium Development Goals
MOE	Ministry of Education
MoFND	Ministry of Finance and National Development
MoLG	Ministry of Local Government
MoLSW	Ministry of Labor and Social welfare
MoLWE	Ministry of Land Water and Environment
МОН	Ministry of Health
NCEW	National Confederation of Eritrean Workers
NSCT	National SDG Coordinating Team
NHP	National Health Policy
NSO	National Statistics Office
NUEW	National Union of Eritrean Women
NUEYS	National Union of Eritrean Youth and Students
РНС	Primary Health Care
SDGs	Sustainable Development Goals
SPF	Security an Police Force
UN	United Nations
UHC	Universal Health Coverage
VNR	Voluntary National Review

### 1. Background

The vision of the Eritrean Government as stated in the National Charter of the People's Front for Democracy and Justice (PFDJ) is to achieve rapid, balanced, home grown; and sustainable economic growth with social equity and justice, anchored on the principle of self-reliance (1). The Government of the State of Eritrea recognizes that a healthy population is necessary for the establishment of a dynamic, productive and resilient society.

The health sector in the country is guided by the National Health Policy, which is implemented through five-year strategic plans. The overall stewardship role of the sector is provided by the MoH. At the regional level, there are 6 Zonal (Zoba level) MOH Branch offices. The sub-zoba or District Medical Offices are the health management offices closet to the community. The sector has adopted an annual operational planning process, which is in the process of getting cascaded down to the sub-zoba and facility levels (2,3).

Eritrea is a country known to have made significant progress in health related MDGs. Eritrea made great progress against several leading causes of death and disease. Life expectancy has increased dramatically; infant and maternal mortality rates have declined remarkably and greatly reduced the tide on HIV/AIDS and malaria deaths.

Building on the achievements of the health Millennium Development Goals (MDGs), Eritrea strives to continue making good progress and achieve SDG-3.

The SDGs set out a vision for a world free from poverty, hunger and disease. The 17 goals (SDGs) which are depicted in figure 1. The single health goal SDG-3 relates to direct actions that influence health within the SDGs. However, achieving health and well-being is also closely intertwined with other SDGs: including the 13 targets of SDG 3, nearly 50 of the 169 targets of the 17 SDGs have a direct impact on health and wellbeing (4,5,6).

### 2. Reducing Maternal and Child Mortality

Eritrea has made considerable progress in improving reproductive, maternal, newborn, child and adolescent health in the past three decades. As shown in figure 1, using nationally representative Survey data of EDHS 1995 (7), EPHS 2010 (8), the 2003 study (9) and trends in health facility based maternal mortality (10), the MOH estimates that maternal mortality ratio was reduced by 81 percent from 998 per 100,000 LB in 1990 to 486 in 2007 and to 184 per 100,000 LB in 2019 (MOH, estimate).



Figure 1: Trend in Maternal Mortality ratio/ 100,000 live births

Data Sources: 1990 (EDHS 1995); 2002 (Misma<mark>y G</mark>hebrehiwet et al, 2003): 2007 (EPHS 2010); 2015 (MOH estimate): 2019 (MOH estimate).

The main driving activities for these achievements are: (i) expanding infrastructure to areas where there is limited access to services (ii) expand and strengthen the community health promoter (to avoid first delay) and the role of the VHC (Supervision) (iii) expand Maternity Waiting Homes (MWH) as a formal policy (iv) improve transport for emergency cases (v) increase the number of staff with Life Saving Skills (LSS) (vi) expand facilities which can provide cEmNOC services (vii) strengthen Maternal Perinatal Death Surveillance and Response (MPDSR).

It is projected that if the country continues with the current set of interventions with the assumption of the current estimates, the country is likely to achieve the SDG target of 70/100,000. However, there is need to accelerate maternal health interventions that improve the health and well-being of mothers during and after pregnancy.

Skilled birth attendance has been recognised as one of the most effective interventions for reducing maternal and neonatal mortality. In Eritrea the percentage of births attended by a skilled birth attendant is increasing from time to time. The proportion of deliveries attended by a skilled health worker has continued to increase from 62% in 2017 to 71% by 2019 (11).

As indicated in figure 2, Neonatal Mortality Rate was reduced by 49 percent, from 35 per 1,000 live births in 1991 to 18 in 2020 (12,13).

Under-five Mortality Rate was reduced by 75 percent, from 153 per 1,000 live births in 1990 to 39 in 2020. The average annual rate of reduction in under-five mortality between 1991 and 2020 is estimated at 4.6 percent. The Sex-Specific under-five mortality rate in females was reduced from 139 deaths per 1,000 live births in 1990 to 35 in 2020, while the under-five mortality rate in males was reduced from 166 in 1990 to 46 in 2020 (28,29). Infant Mortality Rate was reduced by 68 percent, from 94 deaths per 1,000 live births in 1990 to 30 in 2020 (12,13).



Figure 2: Trend in neonatal, infant and under-five mortality rates

Data Source: UN IGME, Levels & Trends in Child Mortality Report 2021 (and previous reports)

As shown in figure 3, in 2019, neonatal mortality in Eritrea accounted for 43 percent of the under-five deaths (and 60 percent of infant deaths). This clearly shows that further reduction in infant and under-five mortality will largely depend on reductions in neonatal mortality.



#### Figure 3: Distribution of under-five deaths by age, 1990-2019

As compared to sub-Saharan Africa and the Africa Region, Eritrea is showing better results in the level as well as the rate of reduction in all child mortalities, including neonatal mortality, infant mortality, under five mortality (see table 1).

Table 1: Comparison of Under-five mortality of Eritrea, Sub-Saharan Africa, Africa and the World.

	1990	2000	2020	ARR (%) 1990-2020
Eritrea	153	85	39	4.5
SS Africa	181	153	74	3.0
Africa	176	150	72	3.0
World	93	76	37	3.1

### **3. Controlling Communicable Diseases**

#### 3.1 HIV/AIDS

The State of Eritrea has made significant progress in halting the spread of HIV, and in improving the quality of life of its people living with HIV and AIDS (PLHIV), through sustained implementation of strategic high impact interventions. In the past years Eritrea have noticed a decline in HIV prevalence and incidence.

Great progress was made in the implementation of the HIV/AIDS interventions, through a wellcoordinated multi-sectoral response. As a result, HIV prevalence declined from 1.1 % to 0.6% and overall incidence rate has declined from 0.43% in per 1000 population from 2005 to 0.1 in 2020. AIDS related deaths have equally declined from 1400 deaths in 2005 to 270 in 2020. HIV testing has become almost universal (around 95%) among pregnant women. As shown in figure 4, HIV positivity among pregnant women had declined from 2.5% in 2003 to 0.2% in 2020. In the same token, HIV positivity among people voluntarily coming for HIV counselling and testing (HCT) had declined from 4.34% in 2003 to 0.3% in 2020.



Figure 4: HIV prevalence trend among ANC attendees, 2004-2019

The current epidemiological studies indicates that HIV prevalence and new infections are decreasing in the general population but the infection remains high among the key populations of higher risk such as sex workers and truck drivers indicating a shift of the epidemic from the generalized to a concentrated type. In 2019, prevalence among female sex workers (FSW) was estimated at 14.8%. During the same period, prevalence among long distance truck drivers (LDTD) was estimated at 4.3%, while that of prison inmates was 1.4%. Overall mother to child transmission (MTCT) rate was estimated at 1.8% (14, 15)

Figure 5 shows HIV positivity among Key Population at High Risk (KPHR)m which include CSW/ Waiters, military, truck drivers and TB patients. KPHR accounts for 20.9 percent of the total HIV positive clients.



Figure 5: Trend of HIV positivity among Key Population at High Risk (KPHR), 2017-2021

As shown in figure 6, the HIV Estimation Incidence has dramatically declined from 2010 onwards and is projected to continue declining. This is due to huge effort made on different activities of the population including the key population at higher risk in collaboration with different partners.





#### 3. 2 Tuberculosis (TB)

Tuberculosis is one of the major public health problems in Eritrea. According to the WHO Global TB Report 2021, there were an estimated 2,873 TB cases (including HIV-associated TB) in Eritrea giving incidence rate of 81/100,000 population for 2020, which is however below 127/100,000 global TB incidence. TB-related mortality was 16/100,000 population for HIV negative and incidence (2.1/100,000 population) of MDR-TB was estimated to be 74 cases (16, 17, 18, 19).

The number of notified TB cases in Eritrea decreased from 2,242 (equivalent to 66.5 per 100,000) in 2016 to 1,616 (45.6/100,000) in 2020, with an average rate of decrease of 9% per year. The treatment coverage for 2020 is 55%. This means 45% (1,009) cases were missing in Eritrea. In 2020, 28 MDR-TB cases were notified, increased from 17 cases in 2019, which is however lower from WHO estimated 74 cases in 2020 (16, 17, 18, 19).

	WHO estimated incidence per100,000 <sup>1</sup>	NTLCP/MOH proposed incidence per 100,000 <sup>2</sup>	Actual notification <sup>3</sup>		Notification rate/100,000	% of annual reduction/year	
2016	74		2242		66		
2017	67		1801		61	-8.3	
2018	89	51	1892		54.8	-10.1	
2019	86	41	1842		52.7	-3.9	
2020	81	37	1616		45.6	-13.5	
	TB notification rate reduction from 2016-2020 <b>31.5%</b>						
1.	WHO annual TB profile from 2016-2021 (20)						
2.	NTLCP 2017-2021 NSP <mark>(21)</mark>						
3.	NTLCP annual report from 2016-2020 <mark>(22)</mark>						

Table 2: TB incidence and	d notification trend,	2016-2020
---------------------------	-----------------------	-----------

Based on the End TB strategy (SDG) milestone estimation, countries are required to decrease TB incidence by 34% in 2020. Hence, the uncertainty of WHO estimation remains to be a challenge.

As shown in figure 7, since 2008, there has been a steady and continuing decline in overall TB notification in Eritrea. The number of notified new and relapse TB cases in Eritrea decreased from 2,970 (equivalent to 70.2 per 100,000 population) in 2008 to 1,616 (45.9/100,000) in 2020, with an average rate of decrease of 2% per year. Since 2016, the TB case notification rate, continuous to decline by an average of 9% per year.



Figure 7: Trend in the number of TB cases and TB case notification rate per 100,000, 2008-2020

TB treatment is one of the most effective interventions in TB control to reduce the prevalent cases in the population and reduce the transmission of infection. As shown in figure 8, over the recent five years the treatment success rate at national level in Eritrea increased from 89% in 2016 to 92% in 2020 (20, 21, 22).

The increase of treatment success rate enhanced due to reduction of death rate from 5% in 2016 to 3.5% in 2020, as well as a reduction of lost to follow-up and those treatment failed, while the proportion in whom not evaluated remained stable.

The high level of treatment success is likely to contribute to reducing disease transmission and could be regarded as one of key factors to observed decline of the TB epidemic downwards (23).



#### Figure 8: national TB treatment success rate



#### 3. 3 Malaria

Malaria in Eritrea is focal, unstable, seasonal by nature and is still a public health concern in the country. A long-term goal of malaria elimination is envisioned to be attained by 2030. In order to achieve this goal, the National Malaria Control Program (NMCP) is implementing a range of preventive and curative strategies. These include, prompt diagnosis & treatment of patients, integrated vector management (use of insecticide treated bed nets, environmental management, larviciding, indoor residual spraying), strengthening of surveillance, prediction and early response to epidemics, capacity building, operation research and health promotion.

Historically, malaria transmission in Eritrea has been classified into three distinct ecoepidemiological strata based upon malaria risk, climate and ecology. These are:

- 1. The coastal plains (altitude 0-1000 meters above sea level) have very similar malaria situations as the western lowlands, but with notably less precipitation.
- 2. The western lowlands with a range of elevation between 700 to 1,500 meters above sea level. Malaria transmission is highly seasonal here and the area is prone to epidemics. Transmission is, however, perennial along rivers, valleys, dams, as well as irrigation projects.
- 3. The highlands (>1500 meters above sea level) are generally free from malaria but are highly prone to malaria epidemics

Eritrea has sustained progress in the reduction of malaria burden over the past two decades and has now embarked towards elimination of malaria. Since 1998, malaria morbidity decreased by more around 90 percent. There has been an exponential decline in malaria deaths from a total of 405 in 1998 to six in 2021.

Forty-one of the total 58 sub-zobas of the country (70%) are malaria endemic localities. As shown in figure 10, zobas Gash Barka, Debub, and Semenawi Keih Bahri (NRS) bearing over 90% of the national burden (24).





	-					
ZONE	2016	2017	2018	2019	2020	2021
Anseba	1	0	4	0	0	1
Debub	4	2	0	0	0	0
Debubawi Keyh Bahri	0	0	0	0	0	0
Gash- barka	6	1	1	2	3	4
Maakel	0	0	0	0	0	0

Table 3: Number of Deaths due toMalaria by zones, 2016-2021

National Referral	3	1	0	1	1	1
Semenawi Keyh Bahri	9	2	0	0	0	0
Total	23	6	5	3	4	6

The incidence varies greatly between and within the different Zobas from zero to 33.1 per 1,000 population per year. Malaria incidence rate dramatically declined from 157 per 1,000 population/year in 1998 to about 10 in 2018 while malaria-related mortalities also declined from 0.186 per 1,000 population in 1998 to 0.0015 in 2018.

Stratification based on 2020 malaria incidence indicated a decline from 34/1000 in 2016 to 18/1000 in 2018 but again an increase towards the year 2020 (30/1000) as shown in the table below. Significant variation in transmission levels was also noted between and within the Zones (provinces).

#### Table 4: Malaria Incidence per 1,000 population at risk

Year	Incidence/1,000
2016	34
2017	22
2018	18
2019	26
2020	30

### 4. Non Communicable Diseases Control

As shown in figure 11, the trend of deaths attributable to the four major NCDs were increasing except for CRD. Even though, the SDG recommends to decrease premature mortality from non-communicable diseases by one third, in 2030, through prevention and treatment and promote mental health and well-being the results doesn't show any decrease in number of deaths. These calls for the need of intensive work in prevention and treatment of these diseases and promoting mental health.





Source: MOH, HMIS Data

According to HMIS 2020 data shown in figure 12, the leading causes of death are Tuberculosis, lower respiratory infection, and diarrheal diseases. It is worth noting that most of the deaths related to communicable diseases have been on a sharp decline over the last 10 years and the deaths due to non-communicable diseases have been on the rise (10).

This is corroborated by HMIS Report, 2020 which indicated that the country is dealing with a dual disease burden of NCDs and communicable diseases although the non-communicable diseases are outstripping the communicable diseases. The annual health service report activity 2020 of the MOH also indicated that non-communicable diseases were the leading causes of morbidity and mortality in the hospital and health center inpatients of the country..

#### Figure 12: Top 10 leading Causes of Mortality, 2009 and 2019 compared

	2009	2019		% change, 2009-2019
Diarrheal diseases	1		Tuberculosis	-7.7%
Tuberculosis	2	2	Lower respiratory infect	-8.3%
Lower respiratory infect	3	3	Diarrheal diseases	-18.0%
Neonatal disorders	4	-4	Neonatal disorders	-14.1%
HIV/AIDS	5	5	Stroke	28.9%
Stroke	6	6	Ischemic heart disease	41.0%
Ischemic heart disease	7	• 7	Cirrhosis	23.1%
Protein-energy malnutrition	8	8	HIV/AIDS	-46.7%
Cirrhosis	9	9	Road injuries	14.1%
Measles		10	Diabetes	36.0%
	Ľ,	$\boldsymbol{X}$		
Road injuries	0/		Protein-energy malnutrition	-34.2%
Diabetes	15	67	Measles	-94.3%

Communicable, maternal, neonatal, and nutritional diseases Non-communicable diseases Injuries

### 5. Universal Health Coverage

Figure 13 presents the UHC focus and coverage mechanisms, including the need of extending services to the non-covered, adding services that are missing, and financial protection through reducing cost sharing and fees.

Figure 13: Universal Health Coverage Focus and Coverage Mechanisms



Currently, the national health infrastructure is comprised of 30 hospitals, 54 health centers and 251 health stations and clinics. The total number of health facilities increased from 93 in 1991 (16 hospitals, 5 health centers and 72 health stations) to 335 in December 2021, which is a 260 percent or 3.6 fold increase in the thirty years between 1991-2020 (30, 31).

As the result of the concerted efforts made to expand health services by building health facilities and equipping them with the necessary equipment and skilled health personnel, access to health care within 10 Km radius, increased from 46 percent in 1991 to 80 percent at present. Currently, around 70 percent of the population live within 5 kms radius (one hour walk) from a health facility (30,31).

**Figure 16: Distributions of Health Facilities** 



As the result of the above stated and many other endeavors and investments of the Government and its partners, there are notable successes in areas of service provision which include: at least one antenatal coverage, which progressively increased from 19 percent in 1991 to 98 percent in 2019. Sixty four percent of mothers of children with 0-11 months attended ANC services, four or more times. Institutional delivery (delivery in a health facility), showed twelve fold increase from almost non-existent- 6 percent in 1991 to 71 percent in 2019 (7,8,11,32); Immunization, increased in coverage and number of antigens from 10 percent for six antigens in 1991 to virtually universal (98 percent) for 12 antigens, including the 3rd dose of Pentavalent, pneumococcal conjugate, measles rubella vaccine etc. (7,8,32,33).

As shown in figure 17, the proportion of deliveries attended by a skilled health worker has continued to increase from 62% in 2017 to 71% by 2019. The proportion of women attending 1<sup>st</sup> ANC was sustained at 96%-98% during the period of the implementation of the strategy while the ANC 4<sup>th</sup> visit, increased marginally from 61% 2017 to 64% in 2020 (LQAS, 2017 and 2019; EPI coverage 2017 and 2020). Meanwhile, the immunization coverage for Measles Containing Vaccine first dose (MCVI) was sustained at 97%-98% between 2017 and 2020 (7,8,11,32,33).

# Figure 17: Coverage of Immunization (DPT3), Antenatal Care Attendance (ANC), and Delivery at Health Facility (HFD), 1991-2019



There has been significant efforts in Eritrea to move the health sector towards UHC. Since, 2016 the country implemented a set of interventions including the definition of the Eritrea Essential Health Care Package (EHCP), which defines the promotion, prevention, clinical, rehabilitative and palliative interventions that the country will aim to provide to all its population, by age group and at each level of care. The EHCP will guide introduction of new services for the population.





The sector was able to introduce ortical care services at Zoba level for all age groups largely in response National, Zoba, Sub Zoba, Community to the preparation for the COVID-19 pandemic. Additionally, all Zobas introduced neonatal and pediatric intensive care services. Costs associated with accessing and using essential health services remain a key barrier to utilization of available services. Currently, the health system has structured charges it imposes, with no fees paid at primary care facilities (health stations, health centres), and for most common services. At hospital level, a fee for service is maintained for non-exempt services, which is lower for referred patients. Poverty certificates are issued where someone is not able to pay.

No fees are charged in the first 24 hours, to ensure people can access emergency services. These user fees do not represent a major financial barrier to accessing services, as a result. The collections are consolidated as part of Government revenue.

The Country is making progress towards the achievement of UHC with the UHC service coverage index increasing from 47.6% to 54% between 2016 and 2019 as shown in figure 19. The UHC Service coverage index is contributed by SRMNCAH, infectious disease, non-communicable and service capacity indices which are generated based on a set of indicators.

Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population). The indicator is an index reported on a unitless scale of 0 to 100, which is computed as the geometric mean of 14 tracer indicators of health service coverage



#### Figure 19: Trends in progress towards UHC

### 6. Clean Water and Sanitation

As shown in figure 20, as of 2021, out of the 2,828 total number of villages in the country, 96.7 percent were triggered and 77 percent were ODF declared.



#### Figure 20: Percent of triggered and ODF declared villages by Zones as of 2021

Eritrea has made significant progress in improving sanitation and hygiene. To evaluate the state of this service area, the country conducted a Water, Sanitation and Hygiene Bottleneck Analysis (WASH-BAT). With this analysis informing the development of a One WASH Strategy and One WASH Investment Plan for 2019-2030, Eritrea implemented a number of reforms. The Ministry of Health took on an increasing important oversight role, ensuring national hygiene standards were met, testing water quality and inspecting food and drink establishments. The country also procured and distributed WASH items, such as aqua-tabs, water filters, and water test kits. To promote community involvement with hygiene and sanitation initiatives, Eritrea provided menstrual hygiene education and conducted sensitization programs on hand and face washing.

As shown in figure 21, the proportion of the population using improved sanitation increased significantly to 54%, while access to improved water source increased to 72% by the end of 2019.



Figure 21: Population access to at least improved source of water and basic sanitation (%)

Data source: EDHS 1995, EDHS 2002; EPHS 2010; MDG report 2015; MOH estimate 2019.

### 7. Health Workforce

The total health workforce has been increasing by 3 to 4 percent annually reaching a total of 11,068 by the end of 2020. Out of this total workforce, 56.3 percent were skilled health professionals and 43.7 percent were administrative and support staff (31). Currently there is no recruitment ceilings/constraints in the country as experienced in many other countries. Thus, all health professionals who graduate from the various training institutions in the country are employed and deployed by the MOH. The Government bears full cost salaries of all health workers.



#### Figure 22: Increments in Health Workforce



Despite the big increase, the HRH-population ratios are still low for the demands of UHC. Hence, production of health workers needs to be well coordinated and jointly planned with the Institutes of higher education, to ensure that appropriate numbers of skilled staff are produced as needed.

### References

- 1. PFDJ (1994). The National Charter of the People's Front for Democracy and Justice (PFDJ), February 1994.
- 2. MOH, 2020. The National Health Policy (NHP-2020). December, 2020.
- 3. MOH, 2022. The Health Sector Strategic Development Plan III (2022-2026). January, 2022.
- 4. UN Resolution 70/1 (2015). Transforming our world: the 2030 Agenda for Sustainable Development. New York.
- 5. UN, SDGs

- 6. WHO and UNICEF (2018). A vision for primary health care in the 21st century: towards universal health coverage and the Sustainable Development Goals. Geneva: WHO and UNICEF.
- 7. National Statistics and Evaluation Office, Eritrea (NSEO) and ORC Marco. (1996). Eritrea Demographic and health survey 1995. Calverton, Maryland, USA; National Statistics and Evaluation Office and ORC Marco.
- National Statistics and Evaluation Office, Eritrea (NSEO) and Fafo -Institute for Applied International Studies Oslo, Norway (2013). Eritrea Population and Health Survey 2010. 2013, Asmara Eritrea.
- 9. Ghebrehiwet Mismay and Morrow H. Richard (2006), Determining the level of Maternal Mortality in Eritrea using RAMOS (Reproductive Age Mortality Study). Journal of Eritrean Medical Association (JEMA), Vol. I, No I, Dec, 2006.
- 10. MOH (2021). Health Management Information System (HMIS/DHIS), Annual Report, 2020.
- 11. MOH (2019). Communicable Diseases Control Division, Lot Quality Assurance Sampling (LQAS), Survey Report for HIV/[ AIDS, STI, TB. 2019, Asmara Eritrea.
- 12. UNICEF, WHO, World Bank, United Nations (2015). Estimates Developed by the UN Inter-agency Group, for Child Mortality Estimation.
- 13. UNICEF, WHO, World Bank, United Nations (2021). Estimates Developed by the UN Inter-agency Group, for Child Mortality Estimation.
- MOH (2019). Department of Public Health, Communicable Diseases control Division, National HIV/AIDS Control Program. The National HIV/AIDS Strategic Plan (2017-2021), Mid-Term Review Report.
- MOH (2019). Department of Public Health, Communicable Diseases control Division, National HIV/AIDS Control Program. Antenatal Sentinel Surveillance (ANC) Survey: National HIV, Syphilis, Hepatitis B, and Hepatitis C Antenatal Sentinel Surveillance (ANC) Survey.
- 16. WHO 2021 Eritrea TB profile.
- 17. WHO 2021 global TB report.
- 18. WHO 2021 Eritrea TB profile.
- 19. NTLCP 2020 Annual TB report.
- 20. WHO annual TB profile from 2016-2021
- 21. NTLCP 2017-2021 NSP
- 22. NTLCP annual report from 2016-2020
- 23. MOH (2019). Department of Public Health, Communicable Diseases control Division, National TB & Leprosy Control Program. The National TB & Leprosy Control Program Strategic Plan (2017-2021) Mid-Term Review Report.
- 24. MOH (2019). Department of Public Health, Communicable Diseases control division, national malaria control program. National Malaria Strategic Plan (2017-2021), Mid-Term Review Report.
- 25. NTDs, plan
- 26. NTDs survey
- 27. WHO (2021). World Health Statistics 2021. WHO, 2021.

- 28. UNDSA (United Nations Population Division), World Population Prospects, World Bank collection of development indicators (2022).
- 29. UNDESA 2019. World Population Prospects (2019 Revision) United Nations population estimates and projections.
- 30. MOH (2018), Health Bulletin, Special Edition, January 2018.
- 31. MOH (2021). Eritrea, Selasa Amet Ab Megedi Tinena (in Tigrigna); meaning Eritrea-Thirty Years on the Road to Health. May, 2021.