



Tanzania Country Profile



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General Country Profile

Geography and population

The United Republic of Tanzania is located in East Africa and has a population of over 53 million people. Tanzania borders the Indian Ocean and eight other countries including Mozambique, Malawi, Zambia, Democratic Republic of the Congo, Burundi, Rwanda, Uganda, and Kenya. It also borders part of Lake Victoria, Africa's largest lake, as well as Lake Tanganyika in the west and Lake Nyasa in the south.

Tanzania is 947,300 square kilometers in total, making it the 31st largest country in the world. Most of Tanzania's land mass is in mainland Africa, though it also has islands Mafia, Pemba, and Zanzibar, with a total of 1,424 kilometers of coastline. The geography of Tanzania includes plains along the coast, a central plateau, and highlands located in the north and south of the country. About 37%



of Tanzania's land is forest. Mount Kilimanjaro, a dormant volcano located in northeastern Tanzania, is the highest elevation in Africa (5,895 m).

Tanzania has a diverse climate. On the coast the climate is tropical, whereas in the highlands it is temperate. During the rainy season there can be flooding in areas of the central plateau. There is also a potential for volcanic activity, as the Ol Doinyo Lengai volcano in Arusha has been active in recent years with occasional earthquakes in surrounding areas. Deforestation is one of the biggest environmental concerns, along with threats to the wildlife through illegal hunting and trade.

History and culture

Many of the oldest archaeological finds ever discovered were discovered in Tanzania at Olduvai Gorge. In this area, Mary Leakey's team discovered the famous 4 million year old Laetoli footprints. Other fossils discovered here are believed to be millions of years old. Olduvai Gorge continues to be a critical area for understanding early human origins.

Approximately 2,000 years ago, the Bantu people came to the area of modern-day Tanzania and developed new systems of government and ironworking techniques. Tanzania became an important center for trade, connecting traders in East Africa with

those located throughout the Indian Ocean. Swahili, one of the Bantu languages, spread rapidly and became a common language of the trading coastal regions.

In 1498, the Portuguese explorer Vasco da Gama traveled to East Africa, and Portugal took control of much of the region in 1506. The Omani Arabs took over in the late 17th century, and in 1840 Omani Sultan Seyyid Said moved his capital to Zanzibar, which became a key center of the Arab slave trade. In 1890, Britain assumed control of Zanzibar, while Germany conquered areas of Tanganyika (modern-day mainland Tanzania). However, Germany faced significant guerrilla war resistance from the Hehe tribe led by Chief Mkwawa; today, many schools and roads throughout the country are named after him. During World War I, Britain invaded mainland East Africa, ending German rule in the area.

Tanganyika declared independence from British rule in 1961. Julius Nyerere, a founder of the Tanganyika African National Union, was the first elected president of Tanzania under the new constitution and served as president until 1985. He was a significant proponent of *ujamaa*, a form of African socialism, and is today considered the “Father of the Nation.” After Tanganyika officially achieved independence from British rule in 1963, the two states of Tanganyika and Zanzibar merged to form the United Republic of Tanzania. Tanzania’s capital was initially Dar es Salaam, though in 1973 Dodoma was chosen to be the new capital due to its central location.

Tanzania is a very diverse nation. The majority of the population is Bantu, consisting of over 130 different tribes. Approximately 60% of the population is Christian, 35% is Muslim, and 1.8% is folk religion, including traditional religious groups such as the Maasai. Zanzibar has a significant Muslim Arab population. There are over a hundred spoken languages in the African language families of Bantu, Cushitic, Nilotic, and Khoisan. After Tanzania declared independence from Britain, Swahili was hailed as a unifying language and was emphasized in schools across the country. Swahili is now the national language with English as a joint official language; Arabic is also prominently spoken in Zanzibar. While Swahili is used throughout the country and government, English is predominantly used in the higher courts and in higher education.

National holidays include Zanzibar Revolution Day (January 12), Karume Day (April 7), Union Day (April 26), Labour Day (May 1), Saba Saba Day (July 7), Nane Nane/Farmer’s Day (August 8), Nyerere Day (October 14), and Independence Day (December 9). National holidays also include religious holidays such as Easter, Eid ul-Fitr, Eid al-Adha, Mawlid Day, and Christmas.

Government and legal system

Tanzania’s government, a presidential republic, is one of the most stable in Africa. It is composed of a judicial branch, a legislative branch, and an executive branch, with presidential elections every five years. President John Pombe Magufuli of the ruling Chama Cha Mapinduzi party (CCM) was elected president of Tanzania in 2015.

The highest judicial courts include the Court of Appeal of the United Republic of Tanzania, the High Court of the United Republic for Mainland Tanzania, and the High Court of Zanzibar. The president appoints members of the judicial branch, who have mandatory retirements at age 60.

The legislative branch includes the National Assembly, which is composed of 393 members. Of these seats, 10 are appointed by the president, 113 are reserved for women, 5 are reserved for appointments by the Zanzibar House of Representatives, and one is the attorney general. The other seats have election cycles every five years. The latest election cycle in 2015 saw a high voter turnout of 62% of eligible voters, with CCM receiving a majority of seats in parliament.

Although there are many accountability checks in place, one of the government’s biggest challenges is corruption and the limited delivery of governmental services. There have been efforts to increase public involvement in governmental actions and to develop more effective public supervision. During his election campaign, President Magufuli emphasized that two of his objectives would be to counter corruption and to expand economic development.

Economy and employment

Tanzania is classified as a low income country by the World Bank. Its gross national income (GNI) per capita was \$920 in 2014, which is lower than the average GNI per capita in the rest of sub-Saharan Africa. However, Tanzania has seen significant growth, as its GNI per capita has increased 44% during the past five years.

In 2015, 84% of women and 99% of men reported being employed during the previous year. Of note, Tanzania ranks number 125 out of 155 countries on the UN’s Gender Inequality Index, reflecting its significant gender disparities in health outcomes, employment opportunities, and social empowerment.

Approximately a quarter of Tanzanians live in urban areas and 80% of the population works in agriculture, though there are efforts to expand industry and manufacturing within the country. In total, literacy rates range from 77% for women and 83% for men. Other educational parameters can be seen in Figure 1.

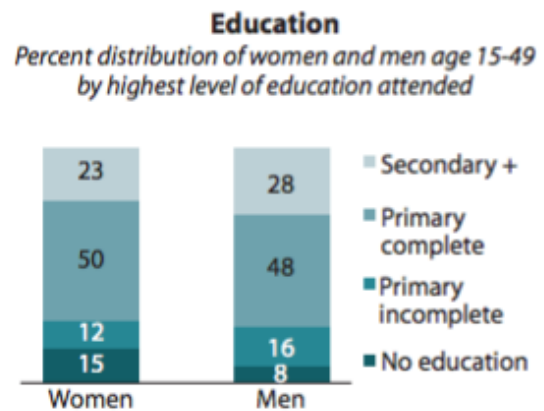


Figure 1

Tanzania has many natural resources, including tin, coal, gold, diamonds, and natural gas. Tanzanian exports, mostly to India and China, amount to \$6 billion per year. A significant portion of its economy is based around tourism, as there are 16 national parks and about 38% of the land is protected for conservation. The Serengeti National park and other safari sites bring in over a million tourists per year. Approximately 11% of

Tanzania’s labor force works in the tourism industry. Much of Tanzania’s recent economic growth has come from expansions of tourism, though this has not addressed poverty issues within rural communities.

Overall, approximately 65% of the population lives in poverty (below \$1.25 per day). Efforts by the Tanzanian government to address poverty include the National Strategy for Growth and Reduction of Poverty (NSGRP), or MKUKUTA in Swahili. The NSGRP establishes direction for the achievement of the Millennium Development Goals (MDGs).

Tanzania has partnered with multiple international organizations for economic development and has received over \$26 billion in aid since 1990. The World Bank’s International Development Association (IDA) has been the main source of monetary aid to Tanzania for the past few decades. The International Monetary Fund (IMF) has also provided Tanzania with significant aid and loans through the Poverty Reduction and Growth Facility program to support economic development. Amongst bilateral donors, the United Kingdom is the single largest nation provider of international aid to Tanzania. In 2014, Tanzania was chosen by USAID for the “Partnership for Growth” initiative, a collaboration between the United States and a select number of countries chosen for their records on public policy and potential for further economic growth.

Physical and technological infrastructure

Water supply and access to sanitation varies widely across the country. Almost half of all Tanzanians do not have access to improved drinking water. In urban areas the access to improved drinking water is much higher (86%) than in rural areas (48%). About a half of households and a third of schools don’t have a water supply. Access to improved sanitation also varies based on geography; 86% of households in rural areas don’t have improved sanitation, compared with 67% in urban areas. In 2007, only 3% of Tanzanians had a flush toilet in their home.

Access to electricity is still limited. Approximately 15-25% of the Tanzanian population has access to electricity at home, which has increased significantly from 5% in 1990. However, there are commonly voltage fluctuations and power shortages. Tanzania’s power source is largely based in hydroelectric generation, which leads to power rationing during droughts. Some of the issues in power stability have also been attributed to corruption within the state-run Tanzania Electric Supply Company (TRANESCO).

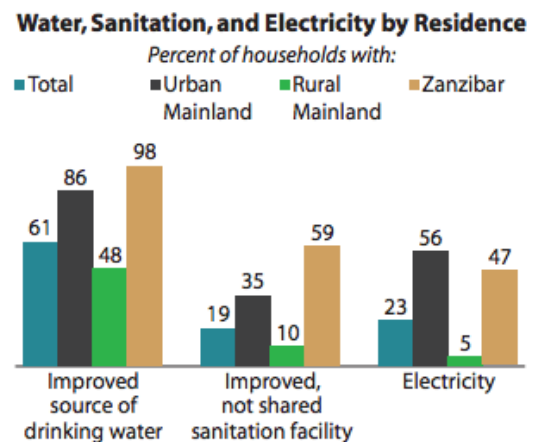


Figure 2

Communications in Tanzania is mostly driven by cellular telephone use. Over 75% of the population has a cell phone, compared with a fixed telephone subscription rate of 0.3%.

The Internet is also a growing technology for communications; approximately 4% of households have a computer, though 12% of the population regularly uses the Internet. There are multiple Internet providers in Tanzania, though many of them do not have widespread coverage in rural areas leading to limited Internet availability outside of cities.

Transportation in Tanzania is largely based on automobiles and railways. Tanzania has a total of over 86,000 km of roads, 8% of which are paved. There is more than 3,600 km of train tracks throughout the country. The Tanzanian government started a new initiative to expand and improve rail infrastructure, with the goal of making Tanzania a center for transport in the region by 2021. There are dozens of airports throughout the country, with international airports in Dar es Salaam, Kilimanjaro, and Zanzibar. Air Tanzania dominates the airline industry, though many other charter companies provide air transportation within the country. Another mode of transportation is boats and ferries, which serve to connect mainland Tanzania with Zanzibar and also can be found on lakes and rivers throughout the country.

Review of National Health Care

National health care profile

The population of Tanzania is overwhelmingly young, as approximately 45% of the population is under the age of 15, while only 5% is over the age of 60.

The life expectancy at birth is 64 for women and 60 for men, which is on par with the life expectancy in other countries in sub-Saharan Africa. Communicable, maternal, perinatal and nutritional conditions account for the majority of deaths (Figure 3). Overall mortality rate has decreased significantly due to improvements in HIV/AIDS prevention and treatment, though the number of non-communicable diseases (road accidents, diabetes, CV diseases, cancers) has increased in recent years.

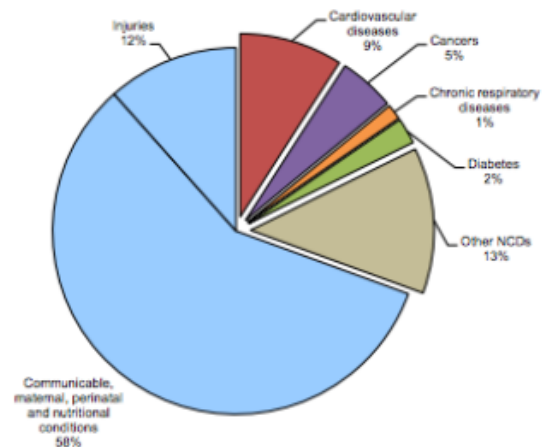


Figure 3

Table 1: Top 10 causes of mortality in 2012

<i>Cause of death</i>	<i>Number of deaths</i>
HIV/AIDS	73,400
Lower respiratory infections	34,900
Diarrheal diseases	21,000
Malaria	20,900
Stroke	14,600
Birth asphyxia and birth trauma	13,400
Preterm birth complications	11,100
Ischemic heart disease	11,000
Road injury	10,700
Diabetes mellitus	9,300

The top five causes of death in the under 5 population include acute respiratory infections, birth asphyxia, prematurity, malaria, and neonatal sepsis. Overall, there is a 20-23% chance probability of dying of any cause before the age of 15. The mortality rate for children under 5 has decreased by 50% from 2004-2015, which surpassed the MDG goal. Even with success in infant and child mortality, maternal mortality remains high.

Childhood Mortality by Residence

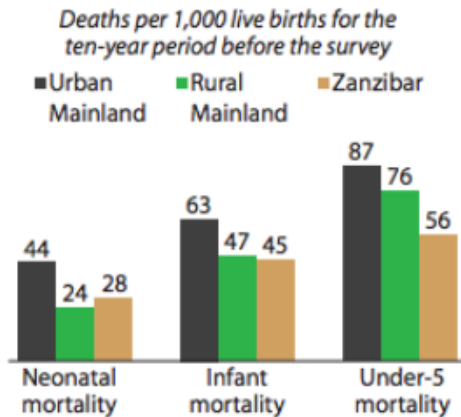


Figure 4

Trends in Maternal Health Care

Percent of live births in the five years before the survey

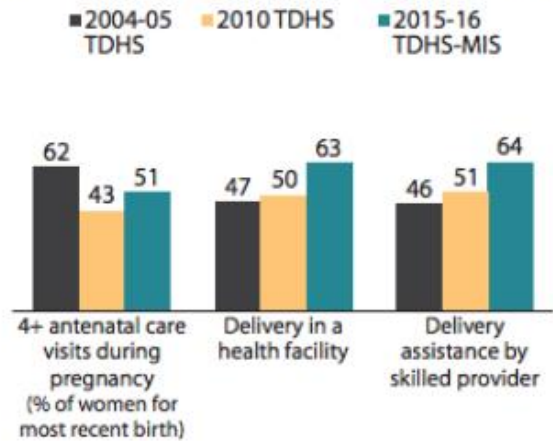


Figure 5

The Millennium Development Goals (MDGs) in Tanzania have focused on infant mortality rate, maternal mortality rate, HIV/AIDS, malaria, and tuberculosis. Table 2 progress in these parameters from the 1990s to recent years. International aid has specifically focused on these health concerns; for example, out of the total \$40 million budget for tuberculosis in 2016, approximately 40% was funded by international sources providing universal coverage.

Table 2: Improvements for specific health care parameters

Indicators	Baseline	Year	Recent data	Year
Neonatal mortality rate (per 1,000 live births)	–	–	25	2015
Infant mortality rate (per 1,000 live births)	–	–	43	2015
Under 5 mortality rate (per 1,000 live births)	167	1990	67	2015
Maternal mortality rate (per 100,000 live births)	910	1990	410	2013
Deaths due to HIV/AIDS (per 100,000 population)	318	2000	153.6	2012
Deaths due to malaria (per 100,000 population)	121.1	2000	43.7	2012
Deaths due to tuberculosis among HIV-negative people (per 100,000 population)	17	2000	12	2013

The majority of Tanzanians name malaria as the “most serious health problem” in their communities. There were a number of interventions prioritized during 2004-2009, including providing free insecticide treated nets, indoor residual spraying, and providing artemisinin-based combination therapy (ACT) for free. These projects decreased the number of malaria cases and deaths by over 75% comparing the year 2009 to the early 2000s. The Demographic and Health Survey and Malaria Indicator Survey (DHS-MIS) 2015-2016, published by the National Bureau of Statistics of the Government of Tanzania, collected information about the nation’s health and malaria statistics, some of which is shown in Table 3.

Other infectious outbreaks include cholera, dengue, and chikungunya. UNICEF and other UN agencies have specifically been working in Burundi refugee camps to contain and treat the cholera outbreaks.

Food access is another one of Tanzania’s most pressing health issues. Tanzania is on the UN list of Low-Income Food-Deficit Countries (LIFCD), as 32% of the population is below the minimum level of dietary energy consumption. Overall, nutritional deficits are the largest contributor to child mortality. The Tanzanian government has developed programs to address food insecurity and nutritional deficiencies, though the prevalence of underweight children is not decreasing at a rate rapidly enough to achieve MDG targets.

Table 3: 2015 Data

<i>HIV/AIDS</i>		<i>Maternal and child health</i>	
Population that is HIV-positive (%)	5.1	Births delivered in a health facility (%)	63
HIV-positive adults taking ART (%)	61	Births assisted by a skilled provider (%)	64
HIV-positive children taking ART (%)	29	Children age 12-23 months with all basic vaccinations (%)	75
<i>Tuberculosis</i>		<i>Nutrition</i>	
Incidence of TB	164,000	Children under 5 who are stunted (%)	34
Incidence of TB+HIV	57,000	Children age 6-59 months who are anemic (%)	58
Incidence of MDR/RR-TB (resistant TB)	2,600	Women age 15-49 who are anemic (%)	45
<i>Malaria</i>		<i>Fertility</i>	
Households with at least one insecticide-treated net (ITN) (%)	66	Total fertility rate (# of children per woman)	5.2
Children <5 who sleep with ITN (%)	55	Median age at first marriage for adult women	19.2
Pregnant women age 15-49 who sleep under an ITN (%)	54	Women age 15-19 who are mothers or currently pregnant (%)	27
Children <5 with fever for whom treatment was sought (%)	80	<i>Family planning</i>	
Malaria prevalence by rapid diagnostic test (RDT) among children age 6-59 months (%)	14	Current use of any family planning method (%)	38
<i>Domestic violence</i>		Demand for family planning (%)	61
Women who have ever experienced spousal violence (%)	42	Demand satisfied by modern methods (%)	53

Overall, there have been recent successes with decreasing child mortality, treating malaria and non-communicable diseases, though continuing to address maternal mortality and HIV/AIDS is critical, as both are significant contributing factors to overall mortality in Tanzania.

National health care structure

The Ministry of Health and Social Welfare in Dar es Salaam manages the public government-funded health care programs throughout the country. The National Health Insurance Fund (NHIF), which works under the Ministry of Health and Social Welfare, was established in 1999 to provide health insurance to government employees. It has since been made available to students, private institutions and individuals as well. The

NHIF covers outpatient and inpatient services, labs, and pharmaceuticals. In 2015, 55% of health facilities throughout the country (6,185 facilities), both public and private, were accredited and were therefore covered by the NHIF. Recently, the NHIF implemented an outreach program to expand coverage to underserved populations.

The NHIF also manages the Community Health Fund (CHF), which was established in 2001 to set up community-based health care. Local governments may set up CHFs, and citizens may choose to pay into this system. The CHF was designed to provide care in rural and underserved populations according to needs and priorities of the local community. By June 2015, the NHIF and CHF were covering 22.7% of the total population of Tanzania.

The Ministry of Finance and Planning developed the National Five Year Development Plan (FYDP) 2016/2017 – 2020/21 titled “Nurturing Industrialization for Economic Transformation and Human Development.” Health interventions in this plan include increased prevention and treatment of HIV/AIDS, construction and maintenance of hospitals and other health care centers, and expanded education for health care professionals.

Overall health expenditure is shared almost equally between the public and private sectors. In 2014, the total expenditure on health per capita was \$137, which represented 12.3% of total government expenditure. The average household spends 48,332 Tanzanian Shillings (\$21.61 USD) on health care per year.

Of all the challenges to access health care in Tanzania, money is the most commonly cited problem. The second most common problem is distance to a health care facility; over a third of the population report long distance travel requirements to access health care services.

Another challenge for access to care is a limited human resource sector. In 2012, there were 0.031 physicians and 0.436 nurses/midwives per 1,000 people. There has been a new push by the government to expand this career sector, with a goal to increase the number of healthcare workers by 330% by the year 2026.

Radiology Resources and Services

Radiology resources are limited in Tanzania. There are approximately fifty radiologists and 400 radiographers working in Tanzania for a population of over 53 million people. There are fewer than ten biomedical physicists and engineers throughout the country, leading to limited ability to support quality of imaging and maintenance of imaging equipment, respectively. Most hospitals in Tanzania only have X-ray and ultrasound capabilities.

In 2007, the government instituted the Medical Radiology and Imaging Professionals Act. This act established the Medical Radiology and Imaging Professionals’ Council, which created a structure for professional radiology work in Tanzania through an overseeing

and regulatory body. The council consists of thirteen members, including representatives from the Tanzania Association of Radiographers (TARA) and the Tanzania Radiology Society (TARASO), as well as other radiology professionals working around the country.

After the International Society of Radiographers & Radiological Technologists (ISRRT) led a workshop with WHO in Tanzania in 2008, they noted that while imaging equipment has been donated and provided to health care centers in Tanzania, they are often not used efficiently due to lack of training and maintenance. Much of the more modern equipment in Tanzania was donated without proper background research into what each healthcare center needs; at one site, the team noted that there were not proper workstations attached to the imaging equipment that would allow for the practical use of the images in patient care.

The government has made some efforts to improve and expand access to radiology services in Tanzania. Part of the Ministry of Finance and Planning's FYDP is to expand physical infrastructure of health care facilities. Besides the construction of many new hospitals, the FYDP details plans to complete construction on a new building of X-ray imaging at Mbeya Referral Hospital in western Tanzania, as well as renovate other facilities and equip them with more modern equipment.

There are a few academic centers around the country that provide educational opportunities in the field of radiology. The Muhimbili University of Health and Allied Sciences (MUHAS) in Dar es Salaam has a department of Radiology & Diagnostic Imaging. This department teaches the MD program and offers a Masters in Medicine in Radiology and diploma programs in diagnostic radiology. The Catholic University of Health and Allied Sciences in Mwanza also offers a diploma course in diagnostic radiology.

The Kilimanjaro Christian Medical Centre (KCMC) was founded in 1971 and runs one of the only MD radiology training programs in the country. KCMC also offers courses to nurses and other healthcare providers. They offer certificate courses in diagnostic ultrasound and diploma courses in diagnostic radiology, the latter of which trains five students per year and has graduated forty-five students since 1995. The residency training program was developed in 1998 for MD graduates. Since 2002, five radiologists completed this program and are all now working within Tanzania. There are currently nine residents in the program.

KCMC's imaging capabilities include CT, ultrasound, and X-ray imaging. One of the only MRI machines in the country is located at NSK Hospital Ltd, a healthcare facility that operates near KCMC in Arusha. The NSK imaging department opened in May 2016, and includes a mammography machine (Mammo Alpha RT), 1.5T MRI (1.5 Tesla MRI Brivo MR355), CT scanner (128 slice CT Optima CT660), X-ray machine (general XR6006), and ultrasound (Ultrasound Logiq C5 Premium 4D BT12), along with two GE Advantage workstations. There are plans to obtain a DEXA Odyssey Pro. As NSK has been expanding its radiology services, KCMC residents have started to rotate through NSK, developing a partnership between these two institutions.

RAD-AID Tanzania, through the New York University (NYU) chapter, has been working with these radiology residents at NSK. Although NSK has a donated MRI machine, there had been no MRI training for the KCMC residents. Along with other projects in collaboration with KCMC, the NYU Department of Radiology has been developing an MRI curriculum to strengthen the breadth of radiology training available to the KCMC residents at NSK.

Conclusion

Although its radiology and healthcare resources are limited, Tanzania has been developing programs to make health care more accessible. Even though there are few professional radiology societies for the few dozen radiologists that work in Tanzania, they remain quite active. Tanzania hosted the 9th biennial congress of the Pan African Congress of Radiology and Imaging (PACORI) in February 2017, focusing on “Increasing access to quality imaging.” Delegates from across Africa attended, and the program included research presentations and many learning opportunities for all attendees. These radiologists have been using limited resources to try to expand access to radiology services for Tanzania’s population.

For the past few years, the NYU RAD-AID chapter has been working with the radiology residency program at KCMC. The NYU chapter has been developing an MRI curriculum for these residents and has been strengthening the learning opportunities available at NSK Hospital. Through continued partnership and collaboration, radiology services in Tanzania should continue to be a focus for the essential goal of expanding access to health care for the population of Tanzania.

References

- Africa: Tanzania. (2017). <https://www.cia.gov/library/publications/the-world-factbook/geos/tz.html>
- ISRRT. (2017). *International Society of Radiographers & Radiological Technologists*, retrieved from <https://www.isrrt.org/> on May 28, 2017.
- ITU. (2017). Statistics. *United Nations Telecommunication Development Sector*, retrieved from <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx> on May 28, 2017.
- KCMC. (2017). *Kilimanjaro Christian Medical Centre*, retrieved from <http://www.kcmc.ac.tz/> on May 28, 2017.
- MoHCDGEC, NBS, OCGS. 2015-2016 Tanzania Demographic and Health Survey and Malaria Indicator Survey. *Ministry of Health, Community Development, Gender, Elderly and Children; National Bureau of Statistics; Office of the Chief Government Statistician*. 2016.
- MUHAS. (2017). School of Radiography. *Muhimbili University of Health and Allied Sciences*, retrieved from <http://iahs.muhas.ac.tz/index.php/features/school-of-radiography> on May 28, 2017.
- NHIF. (2017). *United Republic of Tanzania: National Health Insurance Fund*, retrieved from <http://nhif.or.tz/> on May 28, 2017.
- PACORI. (2017). "PACORI 9th Biennial Scientific Congress", Dar es Salaam, Tanzania. *Pan African Congress of Radiology and Imaging*, retrieved from <http://pacori.co.tz/news-and-events/events/9th-biennial/> on May 28, 2017.
- Parliament of Tanzania. (2017). *United Republic of Tanzania: Parliament of Tanzania*, retrieved from <http://www.parliament.go.tz/> on May 28, 2017.
- Rotarou, E and Ueta, K. Foreign Aid and Economic Development: Tanzania's Experience with ODA. *The Kyoto Economic Review*. Dec 2009. 78(2):157-189.
- UNDP. (2017). Tanzania (United Republic of). *United Nations Development Programme: Human Development Reports*, retrieved from <http://hdr.undp.org/en/countries/profiles/TZA> on May 28, 2017.
- UNICEF. (2017). Tanzania, United Republic of. *The United Nations Children's Fund*, retrieved from <https://www.unicef.org/infobycountry/tanzania.html> on May 28, 2017.
- WHO. (2017). United Republic of Tanzania. *World Health Organization*, retrieved from <http://www.who.int/countries/tza/en/> on May 28, 2017.
- World Bank. (2017). Tanzania. *The World Bank*, retrieved from <http://data.worldbank.org/country/tanzania> on May 28, 2017.