Niger

Muhammad Munshi, MD FRCPC

December 2023

Niger – Country Report

Figure 1: Flag of Niger (1)

Muhammad Munshi, MD FRCPC

December 2022; Published December 2023

Table of Contents

General Country Profile

Geography and Population

Climate and Seasonal Cycles

The northern two-thirds to four-fifths of Niger consists of a tropical desert which is mostly hot, dry, and dusty. In the southern portion of the country, there is a short rainy season that lasts for one to four months. [1] Sometime between April and May, the southern trade winds from the Atlantic move toward the Sahara Desert and meet the harmattan trade winds blowing southwest from the Sahara Desert to the equator. This signals the start of the rainy season. August is the one month in which it rains everywhere except in the far north which is more unpredictable. Rainfall varies depending on the season and location, averaging ten inches per year in the northern two-thirds and thirty inches per year in the southern one-third. [2] Rainfall also varies during the rainy season and from one year to the next. There is also variability in the point of arrival of the rainy season.

Niger resides in one of the hottest regions in the world. In January, afternoon temperatures average in the mid 30s C but may drop to freezing at night in the desert. Temperatures typically rise from February to May and fall thereafter during the rainy season. During the hottest month of May, afternoon temperatures range from 42-45 C in the northern desert. Otherwise, average daily temperatures range from 31 – 41 C, falling to 20 C at night. After the rainy season, temperatures fall again to their annual minimum in December or January. The temperature ranges are greater in the north than the south and more extreme during the dry season. [1]

Geographic Landmarks

Figure 2: Map of Niger (2)

Niger is in Western Africa southeast of Algeria. It occupies a total area of 1.267 million square km, only 300 square km of which is water. [3] It is landlocked bordering seven countries. Its largest border is with Nigeria along its southern border, stretching for 1,608 km. The second largest border is with Chad to the east over 1,196 km. Libya is to the northeast, Algeria is along its northern border for 951 km and Mali is to the northwest. Burkina Faso and Benin are along the southwestern borders and are the two closest countries to the capital city, Niamey.

Population Data

The population of Niger in 2021 was 23,605,767. [3] It is the 56th most populous country in the world. Most of the population live in the southernmost part of the country, along the border with Nigeria and Benin. The capital city of Niamey is home to a population of 1.336 million people. The urban population of Niger is 16.8% with a large rural population of 83.2%.

The population growth rate is 3.65%, the fourth fastest growing population in the world. Niger has a birth rate of 47.28 births/1000 population, the highest in the world, averaging close to seven children per woman. [3] The median age of the population is 14.8 years, the youngest population in the world. Fifty percent of the population is under age 15, 20% are between 15-24 years old, 23% are between 25-54 years old and only 6% are above age 54.

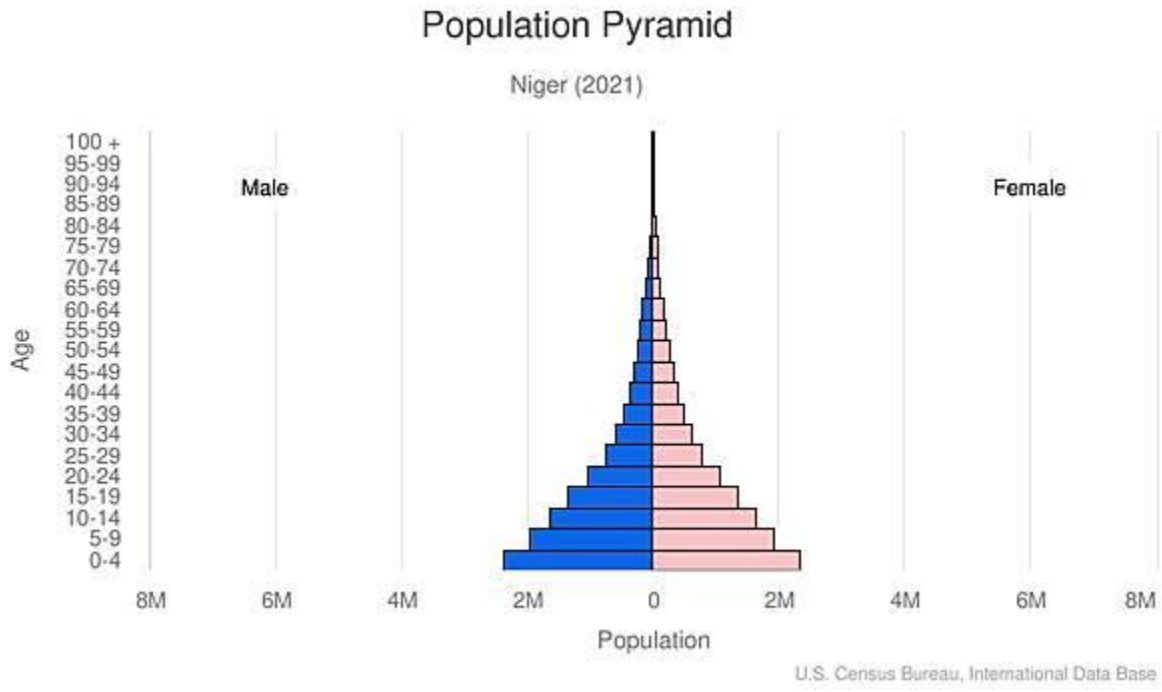

Figure 3. Population Pyramid (3)

Life Expectancy, Education, and Income

The life expectancy in Niger is 59.7 years, 58.1 years for males and 61.2 years for females. [3] This ranks 219 in the world out of 227 countries.

Literacy rates in Niger are 19.1% for the total population; 27.3% for males and 11% for females. School life expectancy is only six years with 3.5% of GDP spent on education. This ranks 118 in the world.

Niger has a United Nations Human Development Index score of 0.394, ranking 189, the lowest in the world. [4] The gross national income (GNI) per capita is $600, ranked the lowest in the world. [4] The most recent data available from 2012, indicates that 90.5% of the population is living in poverty, ranked the highest in the world.

Youth unemployment for ages 15-24 is 16.6%. The child labour rate of 34.4% is the highest in the world. Of children under age 5, 31.3% are underweight, the 5th highest rate in the world. [3]

History and Politics

Brief History

Prior to colonization in the 19th century, Niger was populated by four primary ethnic groups. [3] The Taureg kingdom of Takedda in the north played a significant role in the 14th century for its role in trading of copper. Other ethnic groups included the Hausa within the central portion of Niger, the Kanuri in the east and the Songhai-Zarma in the west. In the late 19th century, France began its conquest of the colonial empire of Niger. France faced resistance most staunchly during the Tuareg uprising in 1916-17 and finally claimed Niger as its own in 1922. [5] France was particularly interested in natural resources such as uranium buried underground.

Niger gained independence from France in 1960 and was under military rule until 1991. At that time multi party elections were held, but further infighting led to military rule again from 1996-1999. Mamadou Tandja was elected in 1999 and subsequently re-elected in 2004. After leading a constitutional amendment to extend his term, he was deposed by a military coup in February of 2010. Issoufou Mahamadou was elected in April 2011 and re-elected in 2016. The first transition from one democratically elected president to another occurred in February of 2021 with the election of Bazoum Mohammed.

In recent years, Niger has been facing a security crisis as armed groups carry out attacks on security forces and civilians in the regions bordering Nigeria, Burkina Faso, and Mali. This has been coupled with an influx of refugees from Nigeria and Mali, with an estimated 241,321 refugees and 300,320 internally displaced people within Niger in February, 2021. [6]

Cultural and Religious Practices, and Languages

Niger is composed of five major ethnic groups. The largest ethnic group in Niger are the Hausa, comprising 53% of the population. The Zarma-Songhai make up 21%, the Tuareg 11%, the Fulani 6.5 % and the Kanuri 5.9%. These share a common religion of Islam, practiced by 99.3 %

of the population with Christianity practiced by 0.3%. Although French is the official language, there are ten recognized national languages. [7] The largest five which correspond to the major ethnicities are Hausa, Zarma-Songhai, Tamajaq, the language of the Tuareg, Fulani or Fulbe, and Kanuri or Beri-Beri. These local languages are used frequently in daily social interactions, with French spoken as a second language. English is not commonly spoken and not recognized as an official language.

The Islamic beliefs and practices are influenced by local cultures. For example, Hausa and Zarma-Songhai rituals include elaborate spirit pantheons, not part of traditional Islamic beliefs. Many pre-Islamic myths and rituals coexist with Quranic traditions. This includes some religious practitioners among both the Hausa and Zarma-Songhia people who use traditional spirit mediums to attempt to bring rain or may perform exorcism or other rituals. There are also significant cultural influences on health care by way of a category of traditional or local healing practitioners. These include Islamic scholars who claim descent from the Prophet, non-Islamic healers who use herbal medicine techniques, bone settlers, and many cult leaders who utilize spirits through music for exorcism or other medical reasons. [7] Due to these traditional cultural beliefs, patients may utilize both Western and traditional healing methods in their treatment. In rural communities, people may be hesitant to use medical clinics and hospitals.

Government and Legal System

Niger is a semi-presidential republic with seven administrative regions (Agadez, Diffa, Dosso, Maradi, Tahoua, Tillaberi, and Zinder) and one capital district of Niamey. [3] The most recent constitution was passed by referendum in October 31, 2010 and enacted on November 25, 2010. The legal system is a mix of civil law, based on French civil law, Islamic law and customary law.

The executive branch of government includes the Chief of State, the head of government, appointed by the President and the cabinet, also appointed by the President. The legislative branch consists of the National Assembly of 171 members. Of these, 158 are elected from the seven regions and the capital district by proportional representation, eight are elected as minorities in special single-seat constituencies and five are elected as Nigeriens living abroad. The judicial branch includes the Constitutional Court and the High Court of Justice, each consisting of seven members. There are many subordinate courts, including the Court of Cassation, the Council of State, the Court of Finances and various tribunals and customary courts.

There are six worldwide governance indicators published by the world bank. [8] Niger scored well below the world median (score from -2.5 for weak to 2.5 for strong) on all of these in 2019.

Table 1: Worldwide Governance Indicators in 2019 [8]

Indicator	Score	World Rank
Individual voice and accountability	-0.57	30.5 percentile
Political stability and absence of violence	-1.40	9.5 percentile
Government effectiveness	-0.80	20.1 percentile
Regulatory quality	-0.67	26.4 percentile
Rule of law	-0.53	32.2 percentile
Control of corruption	-0.55	32.2 percentile

Economy and Employment

Major Industries

As a landlocked country, Niger's economy relies on crops, livestock, and uranium. [3] Agriculture contributes 40% of GDP and provides a livelihood for 80% of its population. Agricultural products include millet, cow peas, sorghum, onions, milk, groundnuts, cassava, cabbage, goat milk and fruit. Other industries include petroleum, cement, brick, soap, textiles, food processing, chemicals and slaughterhouses. Recently, the economy of Niger has been hampered by terrorist activity of its uranium mines and overall instability in Mali and the Diffa region.

Source and Amount of International Aid

In 2019, Niger received 1,49 Billion (US$) in net official development assistance and official aid. [9] This represents 11.1% of Gross National Income.

Table 2: Top Ten Donors of Official Development Assistance in US$ in 2018-19 [9]

International Development Association	342.9 million
EU Institutions	206.1 million
United States	159.3 million
Germany	102.6 million
France	70 million
African Development Fund	68.7 million
UNICEF	44.6 million
Luxembourg	43.3 million
Global Fund	39.1 million
Switzerland	31.7 million

Table 3: Sector Allocation of Official Development Assistance by Percent in 2018-19 [9]

Production	22%
Other Social Infrastructure and Services	18%
Humanitarian Aid	15%
Economic Infrastructure and Services	13%
Health and Population	9%
Programme Assistance	9%
Education	6%
Other and unallocated	6%
Multisector	2%

GDP and Macroeconomic Indicators

Table 4: Macroeconomic Indicators [3]

GDP	$12.9 billion (US$)
Real GDP per capita	$1,225 (US$), country rank = 224/228
Gross National Income	$13.8 billion (US$)
Gross National Income per Capita	$600 (US$)
Unemployment rate	0.3%
Annual inflation rate	-2.5%

Agriculture makes up 41.4% of GDP, industry comprises 19.5% of GDP and services the remainder at 38.7%.

Classification of the Country

Based on the Gross National Income per Capita of $600, Niger can be classified as a low-income country (less than $1,025). [10]

Niger has an extreme poverty rate of 42.9% affecting more than 10 million people. [6]

Ease of Doing Business Index = 56.8 (scale of 0-100), (country rank = 132/190) [8]

Physical and Technological Infrastructure

Telecommunications

Niger has a much larger mobile cellular density of 41 per 100 people than fixed-line service of 1 per 100 people. [3] Niger shares free mobile roaming with other G5 Sahel countries. In southwestern Niger, there is minor use of wire and radio telecommunications.

There is one state run television station with three private television states which run local and foreign programs. A state-run radio station provides the only national radio coverage with 30 private radio stations operating locally as well as 100 community operated radio stations. International radio broadcasts are also available.

There are an estimated 1.1 million internet users in Niger, 5.25% of the population. Broadband networks are rare in Niger, with only an estimated 8,650 users.

Niger has a domestic satellite system with 4 earth stations.

Electricity

95% of electricity in Niger comes from fossil fuels and 5% from other renewable sources. [3] Niger produces 494.7 million kWh of electricity (2016), ranking 167 in the world.

71% of the urban population has access to electricity whereas only 2% of the rural population has access. Overall, 14% of the population has access to electricity.

Transportation

Niger relies primarily on air and road transportation. [3]

It has a total of two national air carriers with only a total of three active aircraft in their fleets. There are thirty airports in Niger, ten of which have paved runways. There is one heliport in Niger. The international airport is in Niamey. [11]

There are 18,949 km of roadways in Niger, over 15,000 km of which are unpaved. The country's most important international transport route is by road to the rail terminus at Parakou, Benin, after which a railway operates service to the port of Cotonou.

The Niger River provides 300 km of waterway from Niamey to Gaya on the Benin frontier from mid-December to March.

Water and Sanitation

95.7% of the population has access to improved water sources within urban areas of Niger. [3] This includes piped water, public tap water, tube wells or boreholes, protected dug wells or protected spring or rainwater collections. However, in rural areas, only 59.2% of the population have access to improved water sources. Given the large rural population, nationally, 65.2% have access to improved water sources.

In urban areas of Niger, 76.6% have access to improved sanitation facilities. [3] This includes the use of toilets piped to a sewer system, septic tank or pit latrine, ventilated latrines, pit latrines with slabs or composting toilets. In rural areas, only 12.9% have access to such facilities. Overall, this represents only 23.3% of the population that have access to improved sanitation. In fact, open defecation is practiced by more than 71% of the population with significant consequences on health and nutrition. [12]

Within schools, only 22.7% have access to clean drinking water and 26.7% have access to improved sanitation. [12]

Given the very poor access to water and sanitation, particularly in rural areas, in the last few years there has been the development of private sector participation in water supply. Challenges remain around lack of a business case, unclear rules of engagement, poor capacity, immature regulation bodies and lack of clarity around roles and responsibilities in the management of rural water supply systems. [13]

Figure 4. School Classroom in Tillaberi (4)

National Health Care Profile

Overall Profile

The life expectancy in Niger is 59.7 years, 58.1 years for males and 61.2 years for females. [3] This ranks 219 in the world out of 227 countries.

Table 5: Child mortality Rates (2019) [14]

Under-one mortality rate (per 1000 live births)	46.72
Neonatal mortality rate (per 1000 live births)	24.26
Under-five mortality rate (per 1000 live births)	80.37

Child mortality rates have improved over the last 3 decades. The under-five mortality rate in 1990 was 275.0 and the under-one mortality rate in 1990 was 120. [1]

Table 6: Top 15 Causes of Death in Niger, Age Standardized (2020) [16]

Cause	Rate per 100,000	World Rank
Coronary Heart Disease	176.94	48
Lower Respiratory Infections	162.34	6
Diarrheal Disease	134.86	7
Stroke	116.22	35
Malaria	49.56	6
Tuberculosis	44.85	35
Road Traffic Accidents	39.13	18
Maternal Conditions	37.54	5
Diabetes Mellitus	37.15	63
Lung Disease	34.85	38
Meningitis	33.78	5
Alzheimers and Dementia	30.03	59
Liver Disease	27.54	43
Malnutrition	26.03	15
HIV/AIDS	25.29	45

Lower respiratory infections, diarrheal disease, malaria, meningitis, and maternal conditions are among the leading causes of death in Niger. Each of these conditions is responsible for a high number of deaths in Niger, among the world's worst. Without standardizing by age, the three leading causes of death are lower respiratory infections (15.17% of deaths), diarrheal disease (10.86% of deaths), and malaria (10.15% of deaths). Low birth weight is the fifth leading cause of death (5.33% of deaths).

This highlights that infectious diseases and perinatal conditions are responsible for a disproportionate number of deaths in Niger than in other countries.

Table 7: Death Rates due to Cancer Type, Age Standardized (2020) [16]

Cancer Type	Rate per 100,000	World Rank
Breast Cancer	14.91	106
Prostate Cancer	10.48	133
Cervical Cancer	7.01	104
Ovarian Cancer	6.52	19
Liver Cancer	5.73	88
Colorectal Cancer	4.47	147
Oral Cancer	2.53	113
Lymphomas	2.00	174
Gastric Cancer	1.86	179
Pancreatic Cancer	1.77	142

Cancer is not a leading cause of death in Niger, but among cancers, ovarian cancer is particularly prevalent, ranking 19th in the world. There are approximately 10,000 new cancers in Niger each year. [17]

The top 5 causes of both death and disability in Niger are diarrheal disease, neonatal disorders, malaria, lower respiratory infections, and measles. [15] There are some significant trends in causes of death from 2009 to 2019. [15] Deaths due to measles have increased by 117% from 2009 to 2019. Deaths due to neonatal disorders have also increased by 29.6%, tuberculosis by 18.1% and lower respiratory infections by 14%. Among non-communicable diseases, deaths due to ischemic heart disease, stroke and congenital defects have increased by 57%, 47% and 31% respectively. This highlights that there is a growing burden of disease among chronic diseases.

Table 8: % Change in Risk Factors Contributing to Death and Disability from 2009-2019 [15]

Risk Factor (order of contribution to DALYs)	**% change**
Malnutrition	+11.9
WaSH	-4.9%
Air Pollution	+16.2
High Blood Pressure	+50.4
Non-optimal Temperature	+20.8
Occupational Risks	+39.3
Dietary Risks	+52.2
High Fasting Plasma Glucose	+102.0
Tobacco	+42.8
High Body Mass Index	+66.9
Kidney Dysfunction	+45.5
Unsafe sex	-28.2

Overall, the majority of risk factors that contribute to death and disability have increased. This may account for the growing burden of disease among non-communicable diseases. Worsening malnutrition is also a factor in progression of disease due to neonatal disorders.

Figure 5. Malnutrition Clinic in Tillaberi (5)

To address the annual malnutrition and malaria peak during food shortages and heavy rain between July and October of 2019, Medecins Sans Frontieres partnered with the Ministry of Public Health to treat 191,400 children for Malaria and 43,400 children for malnutrition in Madaoua, Madarounfa, and Magaria. [18]

In 2020, the WHO supported improvements in data collection and monitoring of maternal and new-born health and trained 86 providers on quality maternal and neonatal care. [19] The WHO also provided various types of equipment to the Issaka Gazoby Maternity Hospital, a tertiary care hospital in Niamey, to improve the quality of care of almost 5,000 pregnant women. This includes four multi-parameter dynamaps, two mobile ultrasound units, a mobile labour monitor, two neonatal resuscitation tables, an electric hoover, two pediatric hoovers and two oxygen concentrators.

The WHO has also introduced community based maternal and new-born care strategy and integrated essential newborn and maternal care in 23 public and private health facilities in Niger. [19] A roadmap for improving the delivery of school based sexual education was also undertaken by the WHO.

More recently, in the first quarter of 2021, there were 3,213 cases of measles compared to 1,081 during the same period in 2020. [20] By April of 2020, there were more than 6,000 suspected cases, including 15 deaths with epidemics declared in 27/73 health districts. The most affected regions are Agadez, Dosso and Tahoua. Measles is the world's most contagious viral disease and one of the main causes of death in young children. It can be eliminated due to vaccination, but in some affected districts in Niger, vaccination coverage is no more than 50% due to worsening security which has displaced people from their homes and the Covid19 pandemic which has slowed overall vaccination campaigns. Groups such as Medecins Sans Frontieres have documented hesitancy to obtain the measles vaccine, due to rumours that the measles and Covid19 vaccines

were being given simultaneously. [20] Decreased vaccination rates have also increased rates of meningitis with more than 1,100 cases identified from January to May of 2021.

Further efforts by Medecins Sans Frontieres to control spread of Covid19 has occurred in 2020-21. This has included training in community prevention, and the setup of water points and hand wash stations in many regions as well as providing treatment in Covid19 treatment centres in Niamey. [21]

There has been considerable impact of the COVID19 pandemic on education. It is estimated that 1.2 million children and youths were out of school for a 16-week period due to pandemic restrictions and the lack of arrangements for home-schooling. [22] Some of these may not have returned to school due to insecurity, poverty, or child labour. This will exacerbate the already 2.6 million children already not attending school. [23] Worsening poverty due to poor education will invariably affect health outcomes.

A 15-year multiphase program has been implemented in 2021 to improve women's and girls' access to improved health and nutrition services, with specific attention to under-five child mortality, maternal mortality and sexual reproductive health. This will benefit 6.5 million people by 2026, including refugees and IDP's with a financing cost of $125 million, supported by a grant from the Global Financing Facility of $25 million. [24]

National Health Care Structure

Structure and Policy

In addition to a small government healthcare system, there are many charitable, religious and NGO operated clinics and public health programs with few private facilities. The Nigerian Ministry of Health operates many government hospitals, maternity hospitals, and other integrated health centres throughout the country. There are 50 hospitals throughout Niger, six located in the capital, Niamey. [25] There are 388 integrated health centres or medical clinics in Niger, 34 of which are in Niamey. There are 54 maternity hospitals in Niger, seven of which are in Niger. This is detailed in Table 9. It is noted that there are many districts which lack health facilities.

Table 9. Distribution of health facilities and population by district in Niger. [25]

The table highlights the total number of hospitals, maternity and integrated health facilities located within each district. Average distance (km) between health facilities (+/- SE) is summarized by district.

Region	District	Hospital (km)	Integrated Health Centre(km)	Maternity (km)	Total Population	Population served by health facility	Area District (km^2)
Agadez	Arlit	119 (37.52) (1)	107(56.02) (7)	111(44.6) (2)	68,064	6,806	201,153
	Bilma	None	None	None	8,458	None	277,591
	CU Agadez	1.04 (1)	1.04 (10)	None	49,361	4,487	65
	Tchighozerine	103(59.03) (2)	133(76.22) (12)	116(63.16) (2)	80,137	5,724	144,714
Diffa	CU Diffa	34(22.76) (2)	51(30.43) (9)	76(36.37) (1)	76,266	6,355	6,834
	Maine-Soroa	76(38.59) (1)	60(33.94) (7)	76(38.59) (1)	82,102	9,122	15,441
	N'Guigmi	None	105(79.79) (3)	None	28,229	9,409	123,724
Dosso	Birni N'Gaoure	52(35.34) (3)	50(33.16) (9)	34(19.4) (1)	202,301	15,561	4,498
	CU Dosso	41(22.19) (2)	57(33.74) (13)	None	232,920	15,528	7,999
	Dogon-Doutchi	61(34.75) (3)	66(42.12) (17)	63(40.16) (5)	305,377	12,215	11,092
	Gaya	59(30.62) (1)	48(28.29) (15)	59(30.62) (1)	161,130	9,478	4,042
	Loga	31(15.33) (2)	32(18.53) (1)	26.64(16.42) (1)	99,085	24,771	3,827
Maradi	Aguie	None	29(5.18) (7)	27(13.38) (1)	178,622	22,328	2,853
	CU Maradi	4(1.8) (2)	4(1.8) (8)	4(1.8) (2)	113,657	9,471	70
	Dakoro	56(26.07) (1)	63(32.31) (12)	56(26.07) (1)	255,371	18,240	16,544
	Guidan-Roumdji	36(20.16) (1)	39(23.16) (9)	36(20.16) (1)	214,193	19,472	4,762
	Madarounfa	21(9.2) (1)	25(12.52) (13)	21(9.2) (1)	194,571	12,971	3,588
	Mayahi	35(17.67) (1)	42(21.83) (8)	35(17.67) (1)	228,199	22,820	6,495

	Tessaoua	40(20.26) (1)	47(26.96) (9)	40(20.26) (1)	204,522	18,592	5,104
Niamey	CU Niamey	7.5(3.81) (6)	8.3(4.2) (34)	8.4(3.97) (7)	397,766	8,463	293
Tahoua	Abalak	None	None	None	40,284	None	12,567
	Birni N'Konni	None	None	None	253,487	None	4,836
	Bouza	None	30(18.05) (2)	None	182,167	91,083	3,546
	Illela	None	None	None	174,191	None	6,480
	Keita	None	None	None	118,452	None	4,955
	Madaoua	None	29(14.45) (1)	None	208,120	208,120	4,509
	Tahoua	40(18.91) (2)	46(23.45) (13)	39(20.32) (3)	229,117	12,728	9,122
	Tchin-Tabarade	None	None	None	53,785	None	60,302
Tillabery/ Tillaberi	Filingue	63(29.41) (2)	71(42.72) (17)	63(40.49) (4)	286,642	12,462	24,153
	Kollo	None	58.5(33.46) (19)	87.1(31.6) (1)	203,068	10,153	7,970
	Ouallam	54(35.93) (1)	69(35.74) (12)	64(33.06) (3)	184,369	11,523	20,724
	Say	65(29) (1)	70(36.27) (6)	50(27.65) (1)	198,201	24,775	14,794
	Tera	51(23.46) (1)	70(41.56) (17)	59(34.48) (2)	284,137	14,206	14,960
	Tillaberi	40(22.68) (1)	56.5(36.9) (19)	52.5(34.69) (3)	164,220	7,140	8,156
Zinder	CU Zinder	0.66(0) (2)	0.66(0) (9)	0.66(0) (2)	119,838	9,218	97
	Goure	62.4(35.19) (2)	83.5(46.5) (14)	61(26.06) (1)	160,130	9,419	89,234
	Magaria	53.5(29.87) (2)	53.6(29.61) (16)	45.5(25.35) (1)	347,686	18,299	8,011
	Matamey	25.6(12.96) (3)	25.4(12.33) (9)	21.5(10.11) (2)	166,903	11,921	2,215
	Miria	40.5(20.69) (1)	58.8(31.88) (24)	40.5(20.69) (1)	427,232	16,432	13,321
	Tanout	66.8(31.5) (1)	58(30.61) (9)	66.8(31.5) (1)	188,098	17,099	33,064

The largest hospitals in the country are the government hospitals of the National Hospital and the Lamorde National Hospital in Niamey. Within Niamey, the largest non-government hospitals are the Gamkalley Clinic, a private hospital, and the CURE Hopital des Enfents au Niger, a non-

profit charitable hospital. In the Maradi region, the Galmi Hospital is a 184-bed mission hospital. Many hospitals are also supported by UNICEF and other external agencies.

To improve access and health outcomes, in 2006, Niger developed a National Strategy to progress to Universal Health Coverage. This was focused on revamping free healthcare for pregnant women and children under 5. [26]

In 2012, Niger adopted a National Health Financing Strategy for Universal Health Coverage which has formed the basis for its fourth National Health Development Plan 2017-2021. [27] In addition to ensuring improved health access, this plan focused on lack of budget predictability, inadequate availability of drugs and vaccines, lack of quality control and lack of available health data. Its aim was to reach the United Nations Sustainable Development Goal for health (SDG-3) and nine other SDG goals indirectly related to health. In July of 2019, Niger began receiving Global Financing Facility (GFF) support to assist with progress toward Universal Health Coverage by 2030 for women, children, and adolescents.[28] This has included partnerships with the National Institute of Statistics, the Ministry of Health, the United Nations Population Fund (UNFPA), UNICEF, the WHO, and Johns Hopkins University. Even with these initiatives, continued challenges in providing Universal Health Coverage have resulted in almost half of health expenditures in Niger that are still "out of pocket". [8]

Health Service Coverage

There are many factors in Niger that limit access to health. This includes the availability and quality of health services as well as financial and geographic accessibility.

To reduce financial barriers to accessing health care, Niger has introduced free health care for family planning, antenatal care including caesarian section, extra-uterine pregnancy, and uterine rupture, treatment of gynecological cancers and all preventive and therapeutic care for children under 5 years of age. [29] There have been significant challenges to this implementation due to limited funding for prepayment reimbursement and lack of adequate medications.

The climate and geography of Niger has resulted in significant challenges in health care delivery. Eighty-percent of Niger is desert. There is a hot and dry climate during the summer months with most rain falling in a two-month period often causing flooding. Campaigns to fight Malaria have required a house-to-house approach to distribute bed nets to within 5 km of each village. [30,31] With 90% of roads in Niger being non-paved, remote villages have often required access by camel, donkey, or boat. This delivery has been further hampered by poor climate and infrastructure.

The majority of transport within Niger is pedestrian. Poor geographic access to health services can impact disease burden. It has been demonstrated that hospitalization from malaria was greatly reduced when primary health facilities were within a two-hour walk. [32] Another study in Burkina Faso has shown that a walking distance of four hours from a health centre doubles the risk of mortality. [33] In Niger, walking 6 hours or 14 km to seek treatment is not unusual. [34]

Six districts, mainly in the region of Tahoua, have no medical facilities. During the dry season, 39% of the population was within a one-hour walk to a health centre, decreasing to 24% during the rainy season. [25] There is also a strong correlation of vaccination rates with proximity to health centres. There is a 1.88 times greater chance of vaccination by age one if children live within one hour of a health centre. [25]

The private sector plays a very limited role in healthcare delivery. Although there are a few private hospitals in Niger, healthcare is largely provided by charitable, religious and non-governmental organizations.

Health Care Expenditures

The latest available data indicates that the current health expenditure as a percentage of GDP is 7.33%. [8] There has been little variance in this over the last 2 decades. The average among least developed countries was 4.02%. By comparison, Canada's health expenditure per GDP in 2018 was 10.79% and in the United States it was 16.88%.

In Niger, current health expenditure per capita is $30.35 in 2018, increased from $10.58 in 2000. The average among least developed countries was $42.82 per capita. By comparison, Canada spent $4994 per capita, and the United States spent $10,623.

Out of pocket expenditure per capita in Niger was $14.81 in 2018. This is almost half of the total health expenditure. The average among least developed countries was $21.06. By comparison, Canadians had out of pocket expenses of $735 per capita, and the United States spent $1148.

External health expenditure per capita in Niger was $9.17 in 2018.

Approximately 75-80% of the public health system is financed by the government with the remainder from international funding sources.

Health Workforce and Infrastructure

In 2017, there were 0.39 hospital beds per 1000 people in Niger. [8] The average among least developed countries was 0.7 beds per 1000 people. By comparison, Canada had 2.53 beds per 1000 people

In 2016, there were 0.043 physicians per 1000 people. The average among least developed countries was 0.3 per 1000 people in 2017. By comparison, Canada had 2.6 physicians per 1000 people in 2017.

In 2016, there were 0.27 nurses and midwives per 1000 people. The average among least developed countries was 0.7 per 1000 people in 2018. By comparison, Canada had 9.9 nurses and midwives per 1000 people in 2018.

In 2014, there were 0.41 surgical specialists per 100,000 people. The average among least developed countries was 1.407 per 100,000 people in 2015. By comparison, Canada had 44 surgical specialists per 100,000 people in 2016.

There is no available data on pharmaceutical personnel in Niger. However, is it very common for medicine to be sold by street vendors since pharmacies are typically much more expensive and the condition of the medication which is exposed to heat and humidity is similar to pharmacies and street vendors. It is reported that a box of paracetamol is four times more expensive in pharmacies. [35] Given this, the availability of pharmaceutical personnel is likely very low.

National Radiology Profile

Radiology Workforce and Training and Professional Representation

Radiology Workforce

Even after conducting an exhaustive search, there is very limited information on the number and distribution of different roles within the radiology workforce. Any available information is also quite outdated. The number of radiologic technologists in Niger was twenty-eight in 2008, unchanged from 2004, from the most recent available data. [36]

Minimal additional information from specific larger hospitals was obtained and is outlined below.

A major hospital in Niamey, the National Hospital, which has 244 beds, has five radiologists as of September of 2018. [37]

The CURE Hôpital des Enfants au Niger in Niamey (CURE Niger) is part of the larger international charitable healthcare NGO, CURE International (CURE), which specialises in the care of children with surgically correctable conditions. Although this hospital offers x-ray services, no radiologist is listed as on site. [38]

The Galmi hospital, in Galmi, Niger, has a staff of about 200, run by the Samaritan's Purse. Although basic x-ray and several small ultrasound machines are available, no radiologist is on staff. [39]

Training and Professional Representation

No information was available as to the level of education and routine training of the radiology workforce.

No information could be obtained about a national professional radiology society or its leadership. It is noted that there is an Association of Radiologists of West Africa with a large focus on radiologists from Nigeria, that may include those from Niger. [40] There are, however, very limited details available regarding this organization. This association publishes a journal, twice yearly, the West African Journal of Radiology with contributions largely from Nigeria. [41]

Regarding other training, in the building of Niger's first radiotherapy treatment center in 2021, the International Atomic Energy Agency (IAEA) organized training for 12 specialists, including radiation oncologists, medical physicists, and radiotherapy technologists. [42] This was the culmination of an imPACT Review by the IAEA in 2010, to evaluate a country's cancer control system. This highlighted the need to develop a training plan for cancer specialists and establish radiotherapy services, which would ideally be integrated and coordinated within a comprehensive national cancer control programme. [43]

Equipment Inventory, Distribution, and Rules and Regulations

Equipment Inventory, Distribution, and Rules and Regulations

There is very limited information available about imaging equipment and distribution. The number of x-rays and ultrasound units is not available, but these are likely to be the most common available modalities. In 2013, the rate of CT in Niger was 0.17 per million. [44] With a population of just over 23 million people, this suggests there were only 4 Ct scanners in Niger in 2013. It is noted that in 2019, Niger imported 2 CT scanners, from Belgium and the EU. [45]

A survey of MRI units in West Africa from 2018 reveals that no MRI units were present throughout Niger. By comparison, neighbouring Nigeria had 58 units. [46]

On June 8, 2021, Niger's first radiotherapy treatment centre was established. [42] With support from the International Atomic Energy Agency and the Islamic Development Bank, the National Centre to Fight Cancer, located in the capital city of Niamey, is expected to provide radiotherapy services to 600 cancer patients from Niger and neighbouring West African countries each year. The centre will consist of two new radiotherapy bunkers to accommodate a cobalt-60 radiotherapy machine and an advanced Linac for cancer treatment. It will also have a CT scanner, a simulator, dosimeters, and a treatment planning system.

There is no information available as to the type and frequency of examinations being performed, the extent of imaging in the private sector, or any local manufacturers.

There is very limited public information about radiation regulation, but the IAEA plays a role. In May 2021, upon the request of the Government of Niger, the IAEA and a team of international experts conducted an International Physical Protection Advisory Service (IPPAS) mission in Niger. [47] This included reviews of the legislative and regulatory framework for the security of radioactive material, regulatory practices (licensing, inspections, and enforcement) and coordination between organizations and stakeholders involved in nuclear security. The mission also covered security of radioactive material, and associated facilities and activities to prevent malicious acts intended or likely to have harmful radiological consequences.

Figures:

1. Country Flags. https://www.countryflags.com/flag-of-niger/. Accessed June 19, 2021.
2. World Atlas. https://www.worldatlas.com/maps/niger. Accessed June 19, 2021.
3. Central Intelligence Agency. https://www.cia.gov/the-world-factbook/countries/niger/images/4f7add6e-d0b4-5b54-bd89-f74b94f39a4f. Accessed June 19, 2021.
4. Visit to school classroom in the region of Tillaberi, Niger with village elders, supported by Islamic Relief Canada. April 27, 2019.
5. Visit to an Islamic Relief Canada supported malnutrition clinic in Tillaberi, Niger with local physician. April 27, 2019.

References:

1. Climate of Niger. Encyclopaedia Britannica. https://www.britannica.com/place/Niger/Climate. Accessed June 13, 2021.
2. Niger - Weather. Adventure Tourism - Experiential Travel Guides. https://www.iexplore.com/articles/travel-guides/africa/niger/weather. Accessed June 13, 2021.
3. Central Intelligence Agency. https://www.cia.gov/the-world-factbook/countries/niger/. Updated June 8, 2021. Accessed June 13, 2021.
4. Human Development Reports. | Human Development Reports. http://hdr.undp.org/en/countries/profiles/NER. Accessed June 13, 2021.
5. Niger - History and Culture. Adventure Tourism - Experiential Travel Guides. https://www.iexplore.com/articles/travel-guides%2Fafrica%2Fniger%2Fhistory-and-culture. Accessed June 13, 2021.
6. World Bank. https://www.worldbank.org/en/country/niger/overview. Updated Apr 28, 2021. Accessed August 15, 2021.
7. Niger. Countries and Their Cultures. https://www.everyculture.com/Ma-Ni/Niger.html. Accessed June 13, 2021.
8. Indicators. World Bank website. https://govdata360.worldbank.org/. Accessed June 13, 2021.
9. OECD. https://www.oecd.org/dac/financing-sustainable-development/development-finance-data/aid-at-a-glance.htm World Population Review. Updated March, 2021. Accessed June 18, 2021.
10. https://worldpopulationreview.com/country-rankings/low-income-countries. Accessed June 14, 2021.
11. Nations Encyclopedia. https://www.nationsencyclopedia.com/Africa/Niger-TRANSPORTATION.html. Accessed June 18, 2021.
12. UNICEF. https://www.unicef.org/niger/water-sanitation-and-hygiene. Accessed June 19, 2021.
13. World Bank. https://blogs.worldbank.org/water/delivering-water-and-sanitation-services-niger-challenges-and-results. Updated Sep 8, 2016. Accessed June 19, 2021.
14. World Health Organization. https://www.who.int/data/gho/data/countries/country-details/GHO/niger?countryProfileId=5ce6f80f-5d12-42d2-9aaa-ac9fdc3586fd. Accessed August15, 2021.
15. Institute for Health Metrics and Evaluation. http://www.healthdata.org/niger. Accessed August 15, 2021.
16. World Health Rankings. https://www.worldlifeexpectancy.com/country-health-profile/niger. Updated August 14, 2021. Accessed August 15, 2021.
17. IAEA. Niger's First Public Radiotherapy Centre Ready to Treat Patients. https://www.iaea.org/newscenter/news/nigers-first-public-radiotherapy-centre-ready-to-treat-patients. Last Updated July 14, 2021. Accessed Oct 9, 2021.
18. Medecins Sans Frontiers. How we're helping in Niger. https://www.doctorswithoutborders.org/what-we-do/countries/niger. Accessed August 21, 2021.

19. World Health Organization. Maternal, new-born, and child health situation in Niger. https://www.who.int/about/accountability/results/who-results-report-2020-mtr/country-story/2020/Niger. Accessed August 21, 2021.
20. Medecins Sans Frontiers. https://www.msf.org/niger-if-vaccinations-fail-happen-effects-will-be-long-lasting. Updated May 21, 2021. Accessed August 15, 2021.
21. Medecins Sans Frontiers. https://www.msf.org/working-communities-niger-during-covid-19-pandemic. Updated May 5, 2020. Accessed August 21, 2021.
22. UNESCO. Education: From disruption to recovery. https://en.unesco.org/covid19/educationresponse. Accessed August 22, 2021.
23. Save the Children. Niger – 1.2 million children and young people were out of school because of Covid19. https://www.savethechildren.net/news/niger-%E2%80%93-12-million-children-and-young-people-were-out-school-because-covid-19. Edited July 26, 2020. Accessed August 22, 2021.
24. Modern Diplomacy. Niger to Improve Women and Girl's Access to Nutrition and Health Services. https://moderndiplomacy.eu/2021/09/25/niger-to-improve-women-and-girls-access-to-nutrition-and-health-services/. Edited September 25, 2021. Accessed October 16, 2021.
25. Blanford, J.I., Kumar, S., Luo, W. *et al.* It's a long, long walk: accessibility to hospitals, maternity, and integrated health centers in Niger. *Int J Health Geogr* 11, 24 (2012).
26. Leadership for UHC. Niger. https://l4uhc.world/countries/countries-niger/. Accessed August 22, 2021.
27. Universal Health Coverage Partnership. https://www.uhcpartnership.net/country-profile/niger/. Accessed August 22, 2021.
28. Countdown to 2030. Niger: Countdown country collaboration. https://www.countdown2030.org/country-collaborations/niger-countdown-country-collaboration. Accessed August 22, 2021.
29. Genovese, E et al. Free Health Care in Niger *European Journal of Public Health*, Volume 30, Issue Supplement 5, September 2020. https://doi.org/10.1093/eurpub/ckaa166.1394
30. Loewenberg S: Niger welcomes largest bednet distribution in history. Lancet. 2006, 367 (9521): 1473-10.
31. Ousmane I, Issifi S, Lama M, Roy J, Hoyer S, Haskew J, Hawley W, Wolkon A, Watkins M, et al: Distribution of Insecticide-Treated Bednets During a Polio Immunization Campaign --- Niger, 2005. MMWR. 2006, 55 (33): 913-916.
32. O'Meara WP, Noor A, Gatakaa H, Tsofa B, McKenzie FE, Marsh K: The impact of primary health care on malaria morbidity–defining access by disease burden. TM & IH. 2009, 14 (1): 29-35.
33. Schoeps A, Gabrysch S, Niamba L, Sie A, Becher H: The effect of distance to health-care facilities on childhood mortality in rural Burkina Faso. Am J Epidemiol. 2011, 173 (5): 492-498.
34. Elliott J: Battling to keep children alive. 2005, London: BBC News. Cited by Blanford, J.I., Kumar, S., Luo, W. et al. It's a long, long walk: accessibility to hospitals, maternity, and integrated health centers in Niger. Int J Health Geogr 11, 24 (2012).
35. The Observers. In Niger, unregulated medicine 'sold like sweets. https://observers.france24.com/en/20181221-niger-unregulated-medicine-markets-drugs. Updated December 21, 2018. Accessed August 21, 2021.

36. World Data Atlas. Niger – Radiographers. https://knoema.com/atlas/Niger/topics/Health/Human-Resources-for-Health/Radiographers. Accessed Oct 9, 2021.
37. U.S. Embassy in Niger. Medical Assistance. https://ne.usembassy.gov/u-s-citizen-services/local-resources-of-u-s-citizens/doctors/. Accessed Oct 16, 2021.
38. Satmed. Niger. https://satmed.com/project_niger.php. Accessed Oct 9, 2021.
39. Samaritan's Purse International Relief. Galmi Hospital. https://www.samaritanspurse.org/medical/mission-hospitals-galmi-hospital-galmi-niger/. Accessed Oct 9, 2021.
40. MRIMEDIC. Association of Radiologists of West Africa. https://mrimedic.com/business-directory/2196/association-of-radiologists-of-west-africa/. Accessed Oct 16, 2021.
41. West African Journal of Radiology. https://www.wajradiology.org/. Accessed Oct 16, 2021.
42. IAEA. Niger's First Public Radiotherapy Centre Ready to Treat Patients. https://www.iaea.org/newscenter/news/nigers-first-public-radiotherapy-centre-ready-to-treat-patients. Last Updated July 14, 2021. Accessed Oct 9, 2021.
43. IAEA. From Plans to Funding: Bankable Documents and Niger's First Radiotherapy Unit. From Plans to Funding: Bankable Documents and Niger's First Radiotherapy Unit | IAEA. Last Updated Nov 19, 2019. Accessed Oct 9, 2021.
44. World Health Organization. Medical Equipment Data by Country. https://apps.who.int/gho/data/node.main.510. Accessed Oct 16, 2021.
45. World Integrated Trade Solution. https://wits.worldbank.org/trade/comtrade/en/country/All/year/2019/tradeflow/Exports/partner/NER/nomen/h5/product/902212. Accessed Oct 9, 2021.
46. Ogbole GI, Adeyomoye AO, Badu-Peprah A, Mensah Y, Nzeh DA. Survey of magnetic resonance imaging availability in West Africa. Pan African Medical Journal. 2018;30. doi:10.11604/pamj.2018.30.240.14000. Accessed Oct 9, 2021.
47. IAEA. IAEA Completes Nuclear Security Advisory Mission in Niger. https://www.iaea.org/newscenter/pressreleases/iaea-completes-nuclear-security-advisory-mission-in-niger. Updated May 28, 2021. Accessed Oct 16, 2021.