Tunisia

Evan Norris
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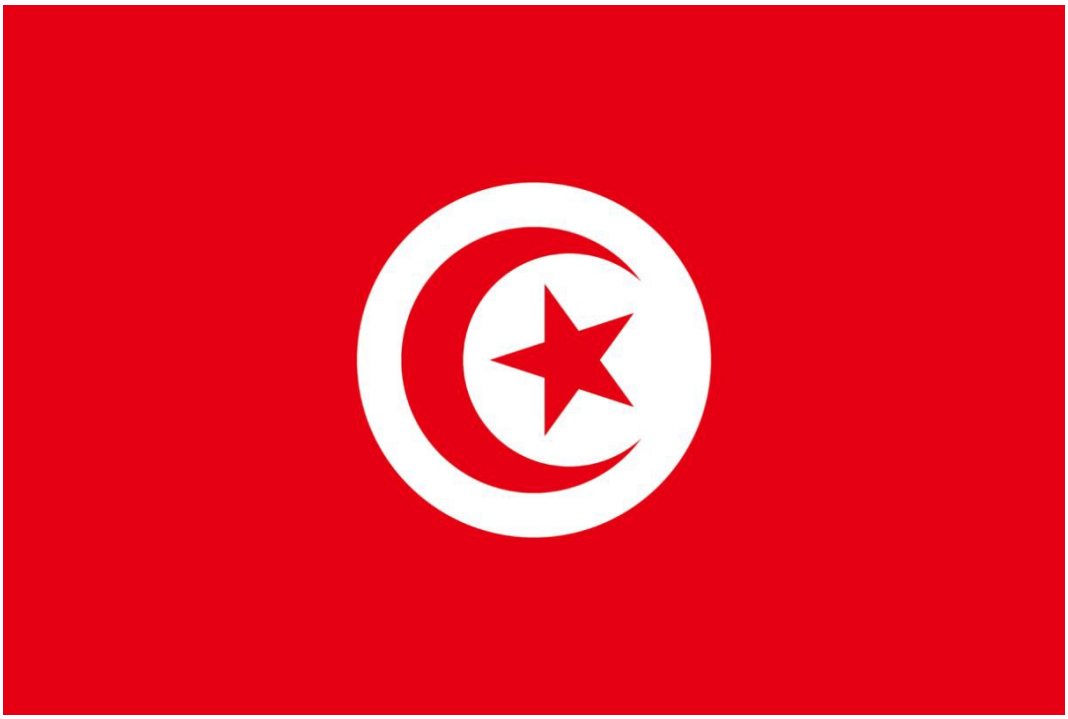
Republic of Tunisia



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General Country Profile

Geography and Population

Tunisia is a North African country bordering the Mediterranean Sea to the north, Algeria to the west, and Libya to the east. It covers approximately 63,000 square miles, which is narrowly larger than the American state of Georgia. Its climate is considered Mediterranean and temperate in the north, and desert in the south. According to the Central Intelligence Agency (CIA) Factbook, its population estimate for July 2020 is 11,721,177, which is ranked as the 79th most populous country (Central Intelligence Agency [CIA], 2020). Its population growth rate is 0.85% per year as of 2020, with approximately 38% of its people under the age of 25 and nearly 9% older than 65 years of age (CIA, 2020). About 70% of its citizens live in an urban setting, with an average rate of urbanization of 1.53% per year (CIA, 2020). The average life expectancy is 76.3 years of age, which places it 100th relative to the rest of the world (CIA, 2020). The median age is 32.7 years. As of 2019, the country's GDP totals just under $39 billion with a per capita GDP of $11,900, which has steadily risen year after year (CIA, 2020). Tunisia spends nearly 7% of its GDP on education (ranked 19th in the world), with a literacy rate of 82%, an average school life expectancy of 15.1 years, with males spending an average of 7.9 years in school and females spending an average of 6.4 years in school (CIA, 2020; Human Development Reports, 2020).

Table I:

Fact Sheet: Geography and Population Summary

Capital	Tunis
Total area (sq mi)	63,170
Total population (2020)	11,721,177
Population aged 0-14 (2020)	25.28% (male 1,529,834/female 1,433,357)
Population aged 15-24 (2020)	112.9% (male 766,331/female 745,888)
Population aged 25-54 (2020)	42.85% (male 2,445,751/female 2,576,335)
Population aged 55-64 (2020)	10.12% (male 587,481/female 598,140)
Population aged >65 (2020)	8.86%
Population growth rate (2020)	0.85%
GDP total (2019)	$38.88 billion
GDP per capita (2019)	$10,756
UN Human Development Index (2019)	0.740

Note. Adapted from *Fact Sheet,* CIA, 2019-2020; *Human Development Indicators*, Human Development Reports, 2020

History and Politics

Tunisia is the ancient home of Carthage, which was a Phoenician kingdom that grew into one of ancient Rome's fiercest adversaries. The fall of Carthage came in 146 BC at the hands of the Romans at the end of the Third Punic War. After many centuries, the Umayyad caliphate brought Islam to North Africa and Tunisia around the 8th century AD. Ottoman rule came to Tunisia in the 1500s. In 1881, the French invaded Tunisia and made it a protectorate until its independence in 1956 (CIA, 2020).

Tunisia achieved its independence from France on March 20th, 1956. For the first thirty-one years of its post-colonial history, Tunisian politics were dominated by its president, Habib Bourguiba, who ruled within a one-party system (CIA, 2020). In 1987, a bloodless coup took place wherein Zine el Abidine Ben Ali overthrew Bourguiba to become the second President of Tunisia (CIA, 2020). In 2011, the Arab Spring movement swept through the Middle East. The backdrop for the Arab Spring started in Sidi Bouzid in 2010 sparked by the self-immolation of Mohamed Bouazizi who was a street vendor there. Protests grew over high unemployment, corruption, poverty, and high food prices (CIA, 2020). By January 2011, hundreds had died in Tunisian protests and eventually, Ben Ali fled the country. These events paved the way for revolution and a new democratic parliamentary and presidential system. To this day, Tunisia is considered the only country that was able to successfully overthrow its government as a result of the Arab Spring movement.

The official languages of Tunisia include Arabic, French, and Berber. The official state religion is Sunni Islam which accounts for 99% of the population. Those identifying with the Christian, Jewish, Shia, and Baha'I communities account for about 1% (CIA, 2020).

Government and Legal System

Tunisia is a parliamentary republic with a mixed legal system that incorporates aspects of French civil law and Islamic Sharia law (CIA, 2020). It has a multiparty system with executive, legislative, and judiciary branches. The president is elected by majority popular vote and serves a five-year term, with eligibility for a second term. The prime minister is selected by the winning legislative party or by winning a coalition and appointment by the president (CIA, 2020).

Table II:

Worldwide Governance Indicators

Indicator	Percentile ranking (2018)
Individual voice & accountability	53.69 (+/- 0.12)
Political stability & absence of violence	16.19 (+/- 0.22)
Government effectiveness	48.56 (+/- 0.18)
Regulatory quality	35.58 (+/- 0.17)
Rule of law	56.25 (+/- 0.14)
Control of corruption	56.25 (+/- 0.13)

Note. Adapted from *Worldwide Governance Indicators*, World Bank, 2018

Economy and Employment

Tunisia is a market-based economy with a GDP of $38.88 billion and an annual GDP growth rate of 1.04% per year, placing it in the category of a lower-middle-income country (CIA, 2020; World Bank, 2019). Its main industries include petroleum, mining, tourism, textiles, footwear, agribusiness, and beverages (CIA, 2020). However, Tunisia has experienced critical economic setbacks in the wake of the global financial crisis of 2008, the Arab Spring in 2011, and a series of terrorist attacks targeting the tourist sector in 2015 which greatly slowed growth, and from which it had only begun to recover by 2017. As a result, total unemployment jumped from around 13% in 2010 to over 18% in 2011. By 2014, total unemployment had improved to around 15%, where it has stagnated since. The current total unemployment rate is 15.1% as of 2019 (World Bank, 2019). Although total unemployment has hovered around 15% since 2014, the overall youth (ages 15-24) unemployment rate has remained significantly higher at 35% (CIA, 2015).

In 2011, the United States began providing government assistance to Tunisia in the wake of the Arab Spring to help in its transition to democracy. In 2018, just over $81 million in aid was disbursed to Tunisia as part of a broader $335 million package to assist in the development of government infrastructure and the cultivation of civil society (U.S. Agency for International Development, 2018). Additionally, the World Bank published that Tunisia received $509 million in loans from the International Bank for Reconstruction and Development as of April 30th, 2020.

Physical and Technological Infrastructure

Tunisia has one state-owned and five privately-owned TV stations, one state-owned radio network with two stations, multiple privately owned and community radio stations, and international media penetration (CIA, 2019). As of 2016, 50.9% of the population were internet users which grew to 64.2% in 2018 (CIA, 2018,

undp.org). As of 2018, there were 128 cellular subscriptions for every 100 people, placing it 68th in the world (CIA, 2018). Of note, government censorship of the internet was abolished in 2013 (CIA,2020).

As of 2016, 100% of Tunisia's population had access to electricity consuming over 15 billion kWH per year, which ranks 79th in the world (CIA, 2016). Approximately 94% of Tunisia's energy is produced by fossil fuels, 1% is produced by hydroelectric, and the remaining 5% is produced by other renewables (CIA, 2016-2017). Tunisia emits approximately 23 million metric tons of carbon dioxide per year, which ranks 82nd in the world (CIA, 2017).

Tunisia has three registered airlines which carried just shy of 3.5 million passengers in 2015 and 4.3 million passengers in 2018 (World Bank, 2015; CIA, 2018). There were approximately 20,000 km of paved roads in 2015, 2173 km of railroad tracks as of 2014, and 29 airports as of 2013 (CIA, 2013-2015).

Tunisia is an arid country with an estimated allocation of water of 450 cubic meters per inhabitant per year (World Health Organization [WHO], 2014). Approximately 78% of Tunisians had access to safely managed sanitation services as of 2017 (Joint Monitoring Programme, 2017). The Société Nationale d'Exploitation et de Distribution des Eaux provides water to 100% of the urban population and 51% of the rural population, with the remaining rural population served by community-based organizations (World Bank, 2018). The state-owned Office National d'Assainissement is the primary servicer of sewage and wastewater treatment (World Bank, 2018). Around 250,000 people still rely on unimproved water sources such as wells and springs (World Bank, 2018). Per the World Bank Water and Sanitation for All in Tunisia 2018 report, there is significant inequality in access to water and sanitation services based on socioeconomic differences, with the poorest citizens using disproportionate levels of unimproved water and having the lowest likelihood of having a sewer connection (World Bank, 2018).

National Health Care Profile

National Health Care Profile

Over the past 60 years, Tunisia experienced a rapid decline in its death rate which subsequently plateaued in the 2010s. Between 1960 and 1997, the death rate decreased each year from a high of approximately 2.3% to a nadir of 0.5% (World Bank, 2018). Since the 1990s, the death rate eventually stabilized between 0.62-0.63% in the 2010s (World Bank, 2018). As of 2018, the neonatal mortality rate was 1.1%, the infant mortality rate was 1.5%, and the under-five mortality rate was 1.7% (United Nations International Children's Emergency Fund [UNICEF], 2018). In 2016, maternal mortality was <1% with 84% of women receiving antenatal care, 89% of women receiving postnatal care, and 100% of women reported to have delivered in a health facility (UNICEF, 2016; World Bank, 2016).

In 2016, there were a total of 61,900 deaths in Tunisia due to non-communicable diseases, accounting for 86% of all deaths (WHO, 2016). While cardiovascular diseases were the most common cause of death in Tunisia (44%), communicable diseases accounted for less than 8% of deaths. This is in line with the global trend of increasing deaths from non-communicable diseases globally. Lastly, ischemic heart disease remained the leading cause of mortality between 2007 and 2017 while neonatal disorders experienced the largest decline from the sixth most common cause of mortality to thirteenth during the same period (Institute for Health Metrics and Evaluation, 2017).

The leading health problems that caused the highest morbidity in 2017 were lower back pain, headache disorders, depressive disorders, drug use disorders, and diabetes (Institute for Health Metrics and Evaluation, 2017). Rates of diabetes increased by just over 44% between 2007 and 2017, which was the highest percent change of any tracked comorbidity over that decade (Institute for Health Metrics and Evaluation, 2017). Additionally, the most common underlying risk factors that caused morbidity and mortality in 2017 were diet, hypertension, tobacco use, high fasting plasma glucose, and high body-mass index, with high fasting plasma glucose experiencing the highest percent increase over the preceding decade at 37% (Institute for Health Metrics and Evaluation, 2017). The commensurate percent increases in the risk factor of high fasting plasma glucose, as well as morbidity related to diabetes, reinforces the health trend in Tunisia of moving towards a health disease profile that more closely matches higher-income nations.

There is a long history of public health campaigns and programs in Tunisia. In 1956, national efforts to control Tuberculosis began as mass screening campaigns. In 1979, a Bacillus Calmette-Guerin vaccination program was initiated. Additionally, public health programs aimed to combat HIV/AIDS and Malaria have been largely successful. Endemic Malaria has officially been eliminated from Tunisia according to a 2017 World Health Organization (WHO) report (WHO, 2017). The Global Fund has sponsored several non-governmental organizations to assist in the fight against HIV/AIDS, which has a low prevalence in Tunisia at 0.1% (WHO,

2017). Such programs include the routine testing of 100% of blood donations, and antiretroviral therapy coverage to prevent maternal-child transmission of HIV (WHO, 2017). A few persistent challenges to combating HIV/AIDS transmission include the lack of methadone substitution therapy and needle exchanges (WHO, 2017).

Evaluation of nutrition in Tunisia has revealed the duality of the problems of anemia and obesity. On one hand, anemia represents under- or malnutrition, while obesity represents excessive unhealthy food intake and physical inactivity. The WHO posits that interventions are needed to address anemia through food fortification, and that healthy food consumption can be promoted through the use of subsidies aimed at reducing intake of fat, sugar, and salt (WHO, 2017).

Given the impact of COVID-19, the World Food Program (WFP) has launched the food security and vulnerability assessment which is aimed at evaluating the impact of the novel coronavirus on Tunisia's rural population (World Food Program [WFP], 2020). Additional interventions include supporting the Tunisian Ministry of Education through the introduction of nutrition and hygiene guidelines relating to the pandemic (WFP, 2020).

National Health Care Structure

According to the Tunisian Ministère de la Santé (Ministry of Health) who oversees the governance of health care, Tunisia has a network of 2172 primary care clinics and basic health centers, 109 district hospitals, and fifty-seven tertiary care centers distributed throughout its twenty-four governorates (Ministère de la Santé Publique, 2016). This further breaks down to a density of 2.33 private and public hospitals in total, 1.19 district/rural hospitals, and 0.68 provincial hospitals per 100,000 people according to 2013 data (Tunisia Health Care Profile, 2015). Around 90% of Tunisians are covered by insurance plans administered by the Caisse Nationale d'Assurance Maladie (CNAM) which was established in 2004 or by the Free Medical Assistance to the Poor (FMAP)/Medical Assistance Schemes (MAS) (Benstead et al, 2017). Although accurate data evaluating the quality and affordability of care is not available, assessment of hospital bed occupancy reveals low efficiency with only 48% of beds being utilized as compared to an Organization for Economic Co-operation and Development (OECD) average of 75% in 2009 (Afra et al., 2013). Tunisia lacks a formal referral system to coordinate services.

Between 2000 and 2017, the Tunisian government increased its current health expenditure (CHE) as a percent of gross domestic product (GDP) from 5% to 7.2% and increased its per capita CHE from US$ 112 to US$ 251 (Global Health Expenditure Database 2020; World Bank, 2017). Tunisia's health care is financed by a combination of the central government which accounts for 23.8%, the taxpayer-funded social health insurance option known as the Caisse Nationale de l'Assurance Maladie which accounts for 27.7%, private insurance which accounts for 7%, and out-of-pocket payments which account for 41.2% (World Bank, 2017). Between the

1990s and 2010s, private health spending grew at an average annual rate of 19%, fueled by increasing pharmaceutical costs and the growing use of private health care (World Bank, 2017).

According to the CIA World Factbook, Tunisia had 1.3 physicians per 1,000 citizens in 2017 (CIA, 2017). This is approximately on par with many Central and South American countries such as Peru and Paraguay, and is equal to the average physician density across the Middle East and North Africa (World Bank, 2017). However, the density of physicians in the capital of Tunis is considerably higher, similar to that of many countries in Western Europe. There were approximately 2.5 nurses and midwives per 1,000 people in 2017 (World Bank, 2017). As of 2015, there were 2.3 hospital beds per 1,000 people, which is just shy of the 2.9 hospital beds per 1,000 people in the United States (Tunisia Health Care Profile, 2015). The density of hospital beds is significantly fewer in rural areas with around 0.12 per 1,000 people (Tunisia Health Care Profile, 2015). This geographic disparity results in limited access to health care services in remote areas.

National Radiology Profile

Radiology Workforce, Training, and Professional Representation

The Tunisian Ministry of Health reported in 2011 that the country had a total of 242 radiologists (Ministère de la Santé Publique, 2011).

Table III:

Distribution of Radiologists in Tunisia

Setting of Practice	Number of Radiologists
University	44 (18%)
Private sector	148 (61%)
Other hospitals and care centers	50 (21%)

Note. Adapted from Ministère de la Santé Publique, 2011

In order to become a radiologist in Tunisia, one must attend one of four medical schools. As opposed to the classic American model of attending four years of undergraduate university followed by four years of medical school, Tunisians undergo six years of a streamlined university and medical school education. This is then followed by subspecialty training which can last up to five additional years, similar to residency training in America. Tunisian medical schools are all public and are located in the urban centers of Tunis, Sfax, Sousse, and Monastir. The active professional radiology societies in Tunisia include the Tunisian Society of Radiology, the International Society of Radiology (ISR), and the Société de Radiologie d'Afrique Noire Francophone (SRANF).

Equipment, Inventory, Distribution, and Rules and Regulations

Table IV:

Availability of Radiology Equipment in Tunisia

Modality	Density (2010-2014)
CT	8.91 per million people
MRI	2 per million people
PET	Unavailable
Gamma Camera	1.18 per million people
Mammography	27.11 per million females aged 50-69

Note. Adapted from *Medical Equipment Data by Country*, WHO, 2016

Of the available imaging modalities, mammography was by far the most abundant. This is commensurate with the country's incidence rate of breast cancer, which is the most common type of cancer in Tunisia (Global Cancer Observatory, 2018).

The distribution of radiology equipment is more concentrated in urban centers than in rural areas, and in the private, as opposed to the public sector as of 2014. Approximately 38% of CT and MRI machines are located in Tunis, 10% are located in Sousse, 4% are located in Monastir, 11% are located in Sfax, and 37% are located in other regions (Ministère de la Santé Publique, 2014). Nearly 70% of CT and MRI scanners are distributed in the private sector (Ministère de la Santé Publique, 2014). Since there are no local producers of imaging equipment, machines of all modalities must be imported.

In 1981, the Centre National de Radioprotection (CNRP) was established with the mission of regulating nuclear and radiological materials, as well as ionizing radiation (Institut de Santé et de Securité au Travail, 2020). The CNRP's duty is to authorize the acquisition and use of equipment that emits radiation, inspect and calibrate said equipment, and manage radiation exposure to radiology workers in the line of duty (Institut de Santé et de Securité au Travail, 2020).

Conclusion

Tunisia boasts a rich history dating back to antiquity, a comfortable Mediterranean climate, a warm and inviting culture, and beautiful topography. There nevertheless remains the undercurrents of geopolitical instability, economic stagnation, and the threat of terrorism which serve as constant reminders of the challenges the country continues to face. While Tunisia lags behind Europe and North America in terms of its medical infrastructure, it has made great strides in the quality of medical services offered to its citizens, as reflected by the rapid improvements in many leading health indicators relative to other countries with similar health care profiles. With the recent rise in the noncommunicable disease burden, a further governmental commitment must be made to ensure equitable healthcare access and delivery, strengthen health promotion, and prioritize disease prevention. Opportunities remain abundant to advance the country's radiology capacity and capabilities, with specific attention needed to grow both the radiology workforce and the availability of imaging equipment, especially in rural communities. Collaborative projects leveraging the resources of international governmental and non-governmental organizations, private entities, and the existing Tunisian medical infrastructure represent a potential way of strengthening relationships while working to continue the trajectory of improving health outcomes for Tunisians.

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