Chapter 15
General Oncology Care in Somalia

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15.1 Somalia Demographics

Africa's easternmost country, Somalia, has a land area of 637,540 km^2, slightly less than that of the state of Texas. Somalia occupies the tip of a region, commonly referred to as the Horn of Africa, because of its resemblance on the map to a rhinoceros's horn, which also includes Ethiopia and Djibouti [1]. Somalia's terrain consists mainly of plateaus, plains, and highlands. To the far north, the rugged east-west ranges of the Karkaar Mountains lie at varying distances from the Gulf of Aden coast. The weather is hot throughout the year, except at the higher elevations in the north. Rainfall is sparse, and most of Somalia has a semiarid to an arid environment suitable only for the nomadic pastoralism practiced by well over half the population. Only in limited areas of moderate rainfall in the northwest, and particularly in the southwest, where the country's two perennial rivers are found, is agriculture practiced to some extent [1]. The local geology suggests the presence of valuable mineral deposits. As of 1992, only a few significant sites had been located, and mineral extraction played a very minor role in the economy [1].

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Somalia's long coastline (3025 km) has been of importance, chiefly in permitting trade with the Middle East and the rest of East Africa. The exploitation of the shore and the continental shelf for fishing and other purposes had barely begun by the early 1990s. Sovereignty was claimed over territorial waters up to 200 nautical miles [1].

Somalia has an estimated population of around 15 million and has been described as Africa's most culturally homogeneous country [2–5]. Around 85% of its residents are ethnic Somalis who have historically inhabited in the country's north. Ethnic minorities are largely concentrated in the south [6, 7]. The official languages of Somalia are Somali and Arabic [6]. Most people in the country are Muslims. Many of them are Sunni [8].

The current population of Somalia is 16,149,487, as of February 1, 2021. Somalia's population in 2020 is estimated at 15,893,222 people in midyear according to UN data. The country's population is equivalent to 0.2% of the total world population. Somalia ranks 73rd in the list of countries (and dependencies) by population [2]. The population density in Somalia is 25 per Km^2 (66 people per mi^2). The total land area is 627,340 Km^2 (242,217 sq. miles). 46.8% of the population is urban (7,431,038 people in 2020). The median age in Somalia is 16.7 years. In 2019, Somalia's female population accounted for approximately 7.74 million, while the male population accounted for approximately 7.7 million inhabitants (Table 15.1) [9]. Table 15.2 shows the top 10 most populated cities in Somalia [10].

Table 15.1 Total population from 2017 to 2019, by gender (in millions) [9]. Prepared by Dr. Hussein Abshir. February 2021

Year	Female	Male
2017	7.31	7.28
2018	7.52	7.48
2019	7.74	7.7

Table 15.2 Top ten most populated cities in Somalia [10]. Dr. Hussein Abshir February 2021

S. No	City name	Population
1	Mogadishu	2,587,183
2	Hargeisa	477, 876
3	Berbera	242, 344
4	Kismayo	234,852
5	Marka	230, 100
6	Jamaame	185,270
7	Baydoa	129,839
8	Buro'	99,270
9	Bosaaso	74,287
10	Afgoi	65,461

15.1.1 Population Fertility Rate in Somalia

The current fertility rate for Somalia in 2021 is 5.845 births per woman, a 1.53% decline from 2020 whereas in 2020, it was 5.936 births per woman, a 1.53% decline from 2019. The fertility rate for Somalia in 2019 was 6.028 births per woman, a 1.5% decline from 2018 and in 2018 it was 6.120 births per woman, a 1.58% decline from 2017 [11].

15.1.2 Life Expectancy in Somalia

The life expectancy of both sexes is 58.3 years (life expectancy at birth, both sexes combined). The life expectancy of females is 60.1 years (life expectancy at birth, females). The life expectancy of males is 56.6 years. Infant mortality in Somalia is 62.8 (infant deaths per 1000 live births). The number of deaths under the age of 5 years is 104.6 (per 1000 live births) [12].

Until the collapse of the federal government in 1991, the organizational and administrative structure of Somalia's healthcare sector was overseen by the Ministry of Health. Regional medical officials enjoyed some authority, but healthcare was largely centralized. The socialist government of former President of Somalia Siad Barre had put an end to private medical practice in 1972 [13]. An exceptional amount of the national budget was devoted to military expenditure, leaving few resources for healthcare, among other services [14].

Somalia's public healthcare system was largely destroyed during the ensuing civil war. As with other previously nationalized sectors, informal providers have filled the vacuum and replaced the former government monopoly over healthcare, with access to facilities witnessing a significant increase. Many new healthcare centers, clinics, hospitals, and pharmacies have in the process been established through homegrown Somali initiatives [15]. The cost of medical consultations and treatment in these facilities is low at $5.72 per visit in health centers (with population coverage of 95%), and $1.89–3.97 per outpatient visit and $7.83–13.95 per bed day in primary through tertiary hospitals [16].

15.2 Cancer Statistics in Somalia

According to the estimate of the International Agency for Research on Cancer (IARC), in 2018, there were 17.0 million new cancer cases and 9.5 million cancer deaths worldwide. By 2040, the global burden is expected to grow to 27.5 million new cancer cases and 16.3 million cancer deaths, simply due to the growth and aging of the population [17].

15.2.1 Cancer Burden in Somalia

The total number of cancer cases in 2018 was 9942, while the total number of cancer deaths in that year was 8198. The future burden will probably be even larger due to the increased prevalence of factors that escalate risks, such as smoking, unhealthy diet, physical inactivity, and fewer childbirths, in economically transitioning countries [17].

Since there is no national cancer registry system in Somalia, the population-based cancer incidence is unknown. Dr. Bas of Erdogan Hospital and Dr. Hussein Abshir of UNISO Hospital have conducted the first study followed by other studies to evaluate the cancer incidence in Somalia, especially in the capital Mogadishu and its surroundings. The first study was conducted between January 01, 2016 and March 01, 2017. The results showed the 10 most common types of cancers were: esophageal ($n = 130$, 32.3%), Non-Hodgkin lymphoma ($n = 35$, 8.7%), liver ($n = 26$, 6.5%), breast ($n = 24$, 6.0%), skin ($n = 17$, 4.2%), thyroid ($n = 13$, 3.2%), brain ($n = 12$, 3.0%), bone ($n = 11$, 2.7%), colorectal ($n = 11$, 2.7%), and soft tissue ($n = 11$, 2.7%). The most common site of cancer in both males and females was the esophagus [18]. Table 15.3 shows the cancer incidence rate in Somalia, 2020 [23].

The second study was done by Erdogan Hospital in Mogadishu/Somalia, titled *Cancer Incidence and Distribution at a Tertiary Care Hospital in Somalia*, published on September 28, 2020, Volume 2020:12 PP. 8599–8611.

These studies aimed to determine both the cancer types and the distribution of cancers by age and gender in patients diagnosed at Somalia Turkey Recep Tayyip Erdogan Education and Research Hospital (STRTEH) and UNISO University Teaching Hospital. Both studies indicated the high incidence rate of esophageal cancer among the Somali population [19]. Due to limited number of patients, the results were not sufficient to reflect the real situation for the whole population. However, the studies can be considered as the first comprehensive retrospective studies on cancer incidence in the region. Furthermore, previous cancer incidence studies related to the population in Somalia were conducted with immigrants living in the United States of America (USA), and mostly focused only on women and on a single type of cancer, e.g., cervical or breast cancer [20].

Thus, a definitive conclusion has not yet been made regarding the incidence of all cancers in Somalia. Because Somali governments in the past and present did not

Table 15.3 Cancer incidence rate in Somalia 2020 [23]. Copyright—Dr. Hussein Abshir

Incidence	Country specific data source	Method	Total population	No. of new cases	No. of deaths	No. of prevalent cases (5- year)
Actual incidence is not known it is just an estimation	Not available	The rates are those of neighboring countries or registries in the same area	15,893,219	10,134	7439	13,212

pay much attention to support cancer programs (it could be due to lack of capacity or resources). Hence, there is no national data available on cancer statistics in Somalia. Somalia never had cancer centers, cancer registries, cancer research centers, cancer control programs, or national cancer policy. The country's government did not formulate a national cancer institution that could deal with the cancer problem. Also, international donors, governments, and Non-Governmental Organizations (NGOs) that assist Somalia, never considered cancer as a priority, which should be dealt immediately. Therefore, currently, there is no national cancer data in Somalia [21]. However, some Somali individual cancer specialists and private hospitals have started a few research studies related to oncology. A Somali doctor who specialized in medical oncology (Dr. Hussein Abshir) came back to Somalia from the diaspora and established the first cancer service center in Somalia in 2014, in collaboration with the University of Somalia, Mogadishu/Somalia. The center started offering chemotherapy services and improved diagnostic accuracy by working with the newly established radiology center, i.e., Kaamil Diagnostic Center. Additionally, the center has started working with some histopathologists who established their private practice. Currently, there are five histopathology labs in Mogadishu/Somalia. There is also one in Hargeisa/Northern Somalia. At present, these labs and the medical oncology center are working together closely by referring patients to each other and consulting with each other to improve the young cancer service that is emerging in Somalia [22].

15.2.2 Upcoming Projects

Some individuals and foreign companies are planning to establish modern private cancer centers and registries. These centers will focus on cancer diagnosis, treatment, and collection of data on cancer issues in Somalia.

15.3 Cancer Risk Factors

1. Infections—Such as viral hepatitis and Human Papillomavirus (HPV), cause 23.7% of the cancer cases in Somalia.
2. Tobacco—7.3% of the cancer cases.
3. UV—6.3%.
4. Obesity—1.2%.
5. Alcohol—0.8%.
6. Occupational risk—0.7% [24].

It is usually not possible to know exactly why one person develops cancer and another does not. However, research has shown that certain risk factors may increase a person's chance of developing cancer. In Somalia, suspected cancer risk factors include

age, alcohol, cancer causing substances, chronic inflammation, diet, hormones, immunosuppression, infectious agents, obesity, radiation, sunlight, tobacco, and chewing a plant called khat. Alcohol consumption is on the rise in Somalia. Cheap alcoholic beverages come from neighboring countries, including Ethiopia and Kenya. Although it is illegal to import alcoholic beverages into Somalia, they are being smuggled in large numbers. The borders are porous, and the Somali coast is largely unguarded.

Smoking is not very common in Somalia, but tobacco is consumed in different ways; for example, a lot of Somalis chew tobacco which increases the risk of developing oral cancers. Unfortunately, using water-pipes (shisha) is becoming more and more popular. It is known that the risk of water-pipe is greater than simply smoking cigarettes. Somalis drink extremely hot beverages, especially hot tea, that has greatly increased the risk of developing esophageal carcinoma, which is the most common cancer in Somalia.

Moreover, Somali people eat a lot of red meat, since meat is cheap in Somalia and available everywhere. The Somali diet is typically deficient in vegetables and fruits, which may lead to an increased risk of developing cancer. Somali people are usually thin and not obese. However, this tendency is changing now. The new trend indicates Somali people are becoming more obese and sedentary, because of massive urbanization and the prevailing insecurity, which is scaring people away from sports and recreational activities [25].

15.4 Cancer Screening Programs

Cancer screening programs are just at the initial stage in Somalia. The past governments of Somalia never came up with a public health policy that would include screening programs. Currently, the most important screening program is for the Hepatitis B virus. According to the current statistics, 20% of the Somali people are carriers of Hepatitis B virus and are at risk of developing Hepatocellular Carcinoma (HCC) any time in the future. Pap smear screening for cervical cancer is now available and more women are becoming aware of the benefits of this screening. Some health facilities have started screening patients for cancers like HCC, breast, and cervical cancers. Women are being taught to do breast self-examination, from the age of 20 and above. A few private hospitals in Mogadishu and Hargeisa have started screening people for the Hepatitis B virus and vaccinating those who are negative for the virus. There are a lot of obstacles and challenges that are not permitting proper cancer screening programs to be established and operated in Somalia. Some of them are mentioned here:

- The Somali government and its institutions lack the financial and human resources needed to fight cancer in Somalia. Only some private nonprofit organizations and concerned individuals are leading the initiatives.
- A large part of the Somali population is ignorant of the disease and its dangers. There is a great need to educate the public about the disease and its impact on the life and the economy of the country. Even if there are programs in place, the public is not aware of the benefits and the importance of the screening programs.

- There is a lack of funding for screening programs. Donor organizations have other priorities for funding. They are not interested in funding such cancer screening programs. There is a need to solicit funders and local philanthropists to get engaged in the funding of these programs.

15.5 Cancer Prevention Programs

Currently, there is no national cancer control program in place. Only some volunteer organizations, for instance, the Somali Cancer Society, Hagarla Institute, and others are trying to provide beneficial services for the society. These voluntary organizations are conducting health education through local media, by organizing seminars, and by sending messages through social media. Some private hospitals have started vaccinations for Human Papillomavirus (HPV) and Hepatitis B virus. Women are being encouraged to do breast self-examination from the age of 20 and up and seek medical attention if they feel any suspicious lump or unusual swelling.

15.5.1 Obstacles and Challenges

- The Ministry of Health in Somalia lacks the capacity to participate in the prevention and control of the incidence of this deadly disease. The government budget cannot cover these programs.
- The majority of Somali people are not aware of the risk factors of this disease and ways and means of avoiding these factors and behaviors.
- There is a need to launch a massive health education to make people aware of the risk factors and avoid them. There is a need to fund programs that could identify risk factors and educate people about these risk factors.

15.6 Cancer Diagnosis

15.6.1 Laboratory

Until 2014, there was no proper diagnosis of cancer in Somalia. There was only one histopathologist in Somalia, but he was killed in an explosion together with other prominent intellectuals. Fortunately, there has been progress in this area. There are currently six pathology labs in Mogadishu that are conducting histopathological diagnoses. Most of these labs have qualified histopathologists (Table 15.4). There is no molecular testing, cytogenetic, and molecular genetic testing available in the country. Figure 15.1 shows the peripheral blood film of a child indicating Acute Lymphoblastic Leukemia (ALL).

Table 15.4 Number of histopathology labs in Mogadishu/Somalia (Source: According to my knowledge of the city). Copyrights—Dr. Hussein Abshir 2021

Name of the Doctor	Name of the facility	Location	Services offered	Price range	Waiting time
Dr. Sagal	Sagal pathology	Hodan district	FNA and histopathology	50–90 US $ per patient.	1–4 days
Dr. Mohamed.	Liibaan	Yakhshid district	FNA and histopathology	70–100 US $	1–7 days
Dr. Wehliye	Veritas	Hodan district	FNA and histopathology	50–90 US $	1–7 days
Dr. Abdullahi	Herd mark	Hodan	FNA and histopathology	50–90 US $	1–7 days
Erdogan Hospital staff	Erdogan Hospital	Hodan district	Cytology and histopathology	20–30 US $ per patient	1–10 days

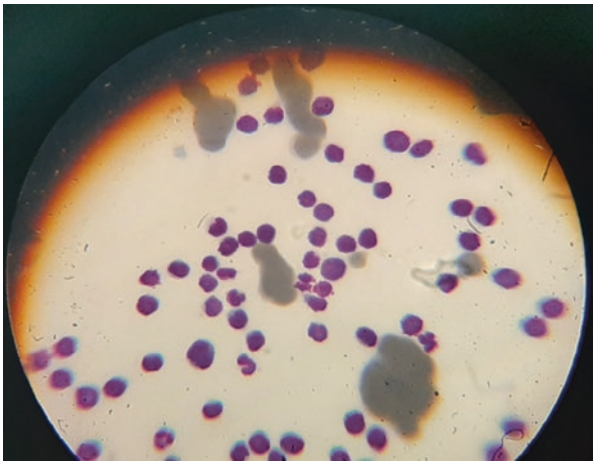

Fig. 15.1 Peripheral blood film of a child indicating Acute Lymphoblastic Leukemia (ALL) Copyright—Dr. Hussein Abshir, 2021

15.6.2 Imaging

Before 2010, there was no single Computed Tomography (CT) scan in Somalia. Today, there are CT scans along with four diagnostic centers that have Magnetic Resonance Imaging (MRI) scans (Table 15.5). The availability of modern imaging equipment and histopathology labs has greatly increased the diagnostic accuracy of cancer in Somalia. Some challenges that the country is facing are as mentioned:

- People are not aware of the importance of seeking diagnosis early enough, mainly because they cannot afford the cost of the tests.

Table 15.5 Number of imaging/radiology centers in Mogadishu/Somalia (Source: Myself; According to my knowledge of the city). Copyright—Dr. Hussein Abshir, 2021-02-09

Name	Location	Services	Price range	Waiting time
Kaamil	Hodan	CT, MRI & sonography	$100–200	1–2 days
Jasiira	Warta	CT	$120	1–2 days
Shaafi	Hodan	CT	$150	1–2 days.
Somali Sudanese	Hodan district	CT	$150	1–2 days
HawoAbdi	Hodan	MRI	$150	1–2 days

- Even if people can afford the cost of the diagnosis, the majority do not understand the importance of early diagnosis. These two factors have caused cancer to be diagnosed at an advanced stage, mostly at stage three or four.
- There is also stigma attached to this disease; a lot of people think this is a contagious disease. Others think this is totally incurable, so there is no need to diagnose them.

15.7 Treatment

15.7.1 Medical Oncology

There is only one medical oncologist in Somalia who is male and trained in China and Canada, Dr. Hussein Abshir Hassan. Currently, the only health facility that is providing cytotoxic chemotherapy treatment is in Mogadishu/Somalia. This is called UNISO Hospital and is a teaching hospital for the University of Somalia. It is attended by Somalia's only medical oncologist, Dr. Hussein Abshir Hassan. At present, there are no facilities that provide high-dose chemotherapy and Stem Cell Transplant (SCT). There is no advanced systemic therapy treatment or availability of immunotherapy/targeted therapy/biological agents.

Accessing these services is a challenge for the financially less fortunate patients, as there is no public coverage for these services. Most of the patients are poor and cannot afford the cost of chemotherapy. Currently, there is only one medical oncologist in Somalia, which is me, Hussein Abshir Hassan. I was trained in China as a medical oncologist (At Wuhan University, Wuhan city, China).

15.7.2 Radiation Therapy

Currently, there are no facilities that provide radiation therapy. However, there is a plan to establish a center soon in Mogadishu/Somalia. There is no availability of functional Linear Accelerators/gamma knife/cyberknife, neither has the country the

facility of Brachytherapy. There are no registered radiation oncologists or clinical oncologists who provide radiation in Somalia.

15.7.3 Surgery

There are several centers for oncological surgery in Mogadishu and Hargeisa. However, there are no robotic surgeries for cancer available in Somalia. Hyperthermic Intraperitoneal Chemotherapy (HIPEC) procedure is not available.

15.7.4 Pediatric Oncology

Somalia does not have the facility of pediatric oncology in the country. There are no centers providing comprehensive pediatric cancer treatment. The statistics of pediatric oncology are not available in Somalia.

15.7.5 Survivorship Track

There is only one hospital performing posttreatment surveillance in Somalia, i.e., the University of Somalia Teaching Hospital.

15.7.6 Palliative Care Track

Palliative care service is offered at UNISO Hospital, the same hospital that is offering chemotherapy and posttreatment surveillance. There is no country-specific palliative care in Somalia.

15.8 Research and Education

The only cancer education that is available in Somalia is a clinical oncology course, given in one semester each year at Somali National University, located in Mogadishu/Somalia. The course is given by Somalia's only cancer specialist, Dr. Hussein Abshir Hassan. This course is given to undergraduate students who are in the final

year of their MBBS program. There are two facilities in Mogadishu/Somalia that are involved in cancer research.

- Erdogan Hospital, run by the Turkish government
- University of Somalia teaching hospital

The research activities in these centers are focused on identifying the most common cancers in Somalia and their distribution in the country. At present, there are no clinical trials that are going on in Somalia.

15.8.1 Publications

- Baş, Y., Hassan, H. A., Adıgüzel, C., Bulur, O., Ibrahim, I. A., & Soydan, S. (2017, June). The distribution of cancer cases in Somalia. In Seminars in oncology (Vol. 44, No. 3, pp. 178–186). WB Saunders.
- Tahtabasi, M., Abdullahi, I. M., Kalayci, M., Ibrahim, I. G., & Er, S. (2020). Cancer Incidence and Distribution at a Tertiary Care Hospital in Somalia from 2017 to 2020: An Initial Report of 1306 Cases. Cancer Management and Research, 12, 8599.

15.9 Cost-Effective Cancer Care

Neither the Somali government nor international donors are spending any money to cover even partially the cost of effective cancer care in Somalia. Patients and their family members are shouldering the burden of cancer care-related problems in Somalia. Currently, the Somali government has no plans to tackle the increasing cancer care costs, increase in utilization of expensive medications (such as immunotherapy), radiation fractionation, etc.

15.10 Challenges and Advantages

Somalia is recovering from a devastating civil war that continued for 30 years. This war has destroyed all the health facilities in the country and since then, the country has not been able to reestablish the healthcare system. This healthcare system has affected cancer care in the country. There is only one facility in the entire country where cancer care is given, UNISO Hospital in Mogadishu/Somalia. This facility

has only chemotherapy and surgical services. No radiation therapy service is available in this facility.

Somali people are extremely generous and giving. They are kind and caring when it comes to sick people. They are the ones paying for the cost of cancer care in Somalia. Most Somali cancer patients go to India for medical treatment. It is estimated that they spend over one billion US dollars in India alone, excluding other countries like Malaysia, Turkey, Thailand, Egypt, China, and Saudi Arabia.

There is an extreme lack of human resources in Somalia for cancer care. Only one medical oncologist and some nurses trained by him are available in the country. The expertise that is available in Somalia for cancer patients includes chemotherapy, surgery, biopsy, histopathology, and imaging services.

The cancer care coverage is private, i.e., payment is paid by patients and their families and, fortunately, there is some outside assistance.

15.10.1 Medical Tourism for Cancer (Either to or from the Country)

Most Somalis travel abroad for cancer treatment after local diagnostic centers diagnose the disease. Top destination countries for medical treatment include India, Turkey, Malaysia, China, Thailand, Egypt, and Saudi Arabia. Some Kenyan and Ethiopian patients come to Mogadishu for medical tourism (ethnically Somalis).

15.10.2 Conflicts and War Effects on Cancer Care

The civil war in Somalia has destroyed the entire healthcare system and still is a major challenge to the restoration of the system. Somalia needs assistance with everything that concerns cancer care.

15.11 The Future of Cancer Care in Somalia

The future of cancer care in Somalia is bright as more doctors are planning to specialize in cancer and more investors are planning to invest privately in the healthcare sector, especially cancer care. Also, as the Somali government is getting stronger, it is hoped the government will play a bigger role in cancer care in Somalia.

Some suggestions to improve cancer care over the next decade in Somalia are mentioned here:

- Somalia needs to train more professionals who can deal with cancer care issues.
- Somalia needs to invest more money in cancer care to provide basic cancer care and diagnostic services, e.g., screening and prevention programs.

- Availability of early detection systems and reliable diagnostic facilities.
- Establishment of cancer centers like radiotherapy centers, cancer care centers, and palliative care centers.
- Research and clinical trials to identify the most common cancers in the country, their risk factors, and to allocate budget according to the distribution of the cancers.

15.12 Conclusion

Cancer is a major health challenge in Somalia. The cancer incidence rate is on the rise in Somalia. Cancer in this country is a neglected national health problem and there is no national cancer control program. The most common cancer in Somalia is Esophageal Cancer (EC) in both male and female patients. EC peaks in the fifth decade, and the most common histological type is squamous cell carcinoma. Liver cancer is the second most common cancer overall and is more common in men. Cervical cancer is the second most common cancer among women. Breast cancer is the third most common overall and in women. Other common cancers are Non-Hodgkin Lymphoma, pancreatic cancer, skin, thyroid, brain, bone, colorectal, and soft tissue. Because of the 30 years of conflict, Somalia has lost its healthcare system, including cancer care services. Currently, Somalia has no effective cancer care system and is up to the challenge of dealing with the increasing cancer cases in Somalia.

At present, Somalia has only one cancer specialist doctor, who is trying to provide basic cancer care services, e.g., chemotherapy, palliative care, and public health education through the media. There is no radiotherapy service, no reliable diagnostic centers, no national reliable data, no cancer registries, or cancer centers. The Somalia government and the international Non-Governmental Organizations have other priorities and are not involved in the fight against cancer in Somalia. According to the cancer studies done in Somalia, there is a high incidence rate of esophageal cancer and strongly suggests that environmental risk factors and nutritional habits have a strong impact on the population. Serious and extensive research on the etiology of esophageal cancer is required.

Conflict of Interest Authors have no conflict of interest to declare.

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