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# HEALTHY HEART

## **Cardiovascular Disease and Mortality in Egypt**

An Epidemiological Analysis of Prevalence Risk Factors and National Intervention Outcomes

**CARDIOTRITITION®**

Series :

*Healthy Heart, Healthy Living*

### **Can we Reverse Egypt's Leading Cause of Death?**

**Cardiovascular Disease (CVD)** remains the leading cause of morbidity and mortality in Egypt, accounting for approximately **46%** of all deaths.

As **Egypt** aligns with the National Health Strategy 2025–2030, This analysis evaluates the central pathological drivers, examines the efficacy of national interventions in addressing these pervasive risk factors, and study the tangible impact of the "100 Million Healthy Lives" presidential initiatives.

Advancing the frontiers of cardiac health by integrating epidemiological insights with cutting-edge nanomedicine to secure a healthier future for Egypt.

### ● **Critical Analysis Areas**

- **The Burden of Hypertension:** Analysis of the "silent killer" in Egypt, where nearly 4 million adults remain with uncontrolled high blood pressure despite expanded screening.
- **The Metabolic Nexus:** Investigating the correlation between Egypt's high obesity rates (the highest in the MENA region for women) and the rising incidence of Type 2 Diabetes.
- **Intervention Efficacy:** A data-driven review of the 100 Million Healthy Lives initiative, assessing how mass screening has shifted early detection rates and lowered long-term healthcare costs.
- **Pathophysiological Drivers:** Examining how cardiac hypoxia leads to ATP depletion and oxidative stress, which are central to CVD progression in the Egyptian population.

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# Cardiovascular Disease and Mortality in Egypt

## An Epidemiological Analysis of Prevalence Risk Factors and National Intervention Outcomes

The epidemiological profile of the Arab Republic of **Egypt** is currently characterized by a profound and rapid transition from a disease burden dominated by communicable, maternal, neonatal, and nutritional conditions to one dictated by noncommunicable diseases (NCDs).

Within this shift, cardiovascular diseases (CVD) have emerged as the paramount challenge to public health, individual longevity, and economic stability. By 2025, NCDs accounted for a staggering 54% of all deaths in Egypt, with cardiovascular conditions representing the largest single contributor to this mortality.<sup>1</sup> The absolute volume of cardiovascular deaths recorded in 2025 reached 275,665, placing the nation in the top 20% of countries globally for age-standardized CVD mortality rates.<sup>2</sup>

This burden is not merely a statistical artifact of aging but a complex consequence of deep-seated metabolic risk factors, nutritional shifts, and socioeconomic variations that have accelerated over the past two decades.

### Demographic Context and Mortality Transitions

Understanding the cardiovascular crisis in Egypt requires a thorough analysis of the country's demographic evolution. As of 2025, the population of Egypt stands at approximately 118.5 million, with projections indicating a 41% increase to over 161.6 million by 2050.<sup>1</sup>

This rapid population growth is occurring alongside a significant shift in the age structure. While the population remains relatively young compared to Western Europe or East Asia, the absolute number of individuals entering age cohorts highly susceptible to cardiovascular events is increasing.

Life expectancy at birth reached a peak of 71.6 years in 2019, reflecting decades of improvement in sanitation, infectious disease control, and maternal care.<sup>1</sup> However, the period between 2019 and 2021 saw a regression to 69.1 years, a decline exacerbated by the COVID-19 pandemic and the cumulative impact of chronic diseases.<sup>1</sup>

**TABLE 1: Population and Life Expectancy Projections 2025-2050**

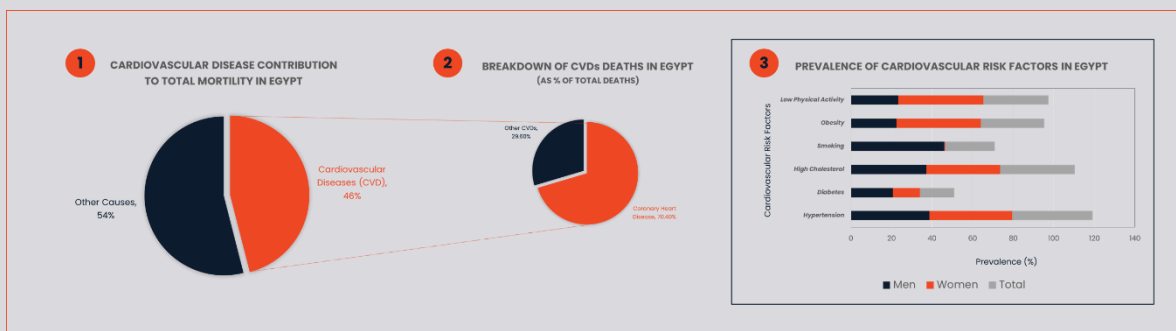
Demographic Indicator	2025 Value	2050 Projection	Change (%)
Total Population	118,535,772	161,630,192	+41.1%
Life Expectancy (Both Sexes)	69.1 years	-	-
Life Expectancy (Female)	71.7 years	-	-
Life Expectancy (Male)	66.7 years	-	-
Healthy Life Expectancy (HALE)	60.4 years	-	-

Source: Data sourced from.<sup>1</sup>

The divergence in healthy life expectancy (HALE) between genders provides a critical insight into the disparate impacts of NCDs. Between 2000 and 2021, HALE for females in Egypt worsened by 0.415 years, while HALE for males improved by 0.375 years.<sup>3</sup> This suggests that while women may live longer in absolute terms, they are spending a greater portion of their lives in a state of poor health, often driven by high rates of obesity and diabetes. In 2021, the healthy life expectancy at birth was 61.1 years for females and 59.7 years for males.<sup>1</sup> The narrowing gap in HALE reflects a mounting burden of morbidity that places immense pressure on the national healthcare infrastructure.

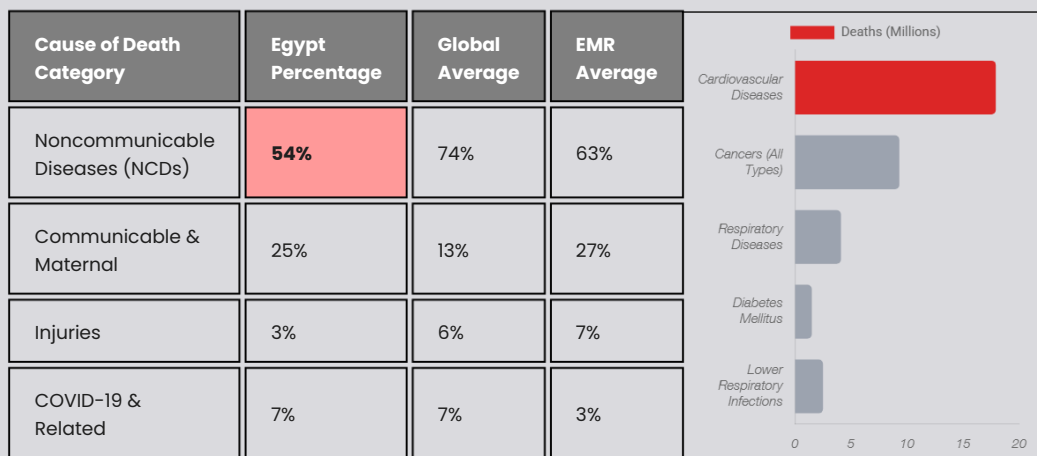
The overall mortality distribution in 2021 further illustrates the dominance of noncommunicable conditions. While communicable, maternal, and nutritional conditions still account for 25% of deaths, and injuries for 3%, the 64% attributed to NCDs defines the current health landscape.<sup>1</sup> Ischemic heart disease (IHD) alone was responsible for 19.2% of total deaths, a figure matched only by the acute impact of the COVID-19 pandemic during that specific year.<sup>1</sup> Stroke and hypertensive heart disease contributed an additional 9.0% and 3.2%, respectively, meaning that nearly one in three deaths in Egypt is directly attributable to a vascular event.<sup>1</sup>

### EXHIBIT 1: Cardiovascular Health Dashboard – Egypt 2025



Source: Data sourced from.<sup>2</sup>

### EXHIBIT 2: Comparative Mortality Statistics – Egypt 2025



Source: Data sourced from.<sup>1</sup>

### The Burden of Ischemic Heart Disease and Stroke

Ischemic heart disease represents the apex of the cardiovascular crisis in Egypt. The age-standardized mortality rate from CVD in Egypt is among the highest globally, reflecting a population that experiences cardiac events earlier in life compared to high-income regions.<sup>2</sup> The 2017 national STEPS survey revealed that 46.6% of total deaths were attributable to CVD, with IHD specifically causing 31.8% of deaths.<sup>5</sup> In contrast, IHD causes approximately 18.7% of deaths in the United States, highlighting a disproportionately high burden in the Egyptian context.<sup>5</sup>

The prevalence of eASCVD (established atherosclerotic cardiovascular disease) among high-risk groups, such as those with Type 2 Diabetes (T2DM), is particularly alarming. In a study of 550 adult T2DM patients in Egypt, the prevalence of

eASCVD was found to be 19.6%.<sup>4</sup> More concerning is the fact that 85.5% of the diabetic population without established eASCVD were categorized as "high risk" for such a disease, meaning approximately 99% of the diabetic population in Egypt falls into either the "high" or "very high" risk categories for a cardiovascular event.<sup>4</sup>

Stroke mortality also presents a significant public health concern. Between 2000 and 2019, stroke deaths in Egypt increased from 41.69 to 43.84 per 100,000 population.<sup>7</sup> The incidence of stroke is frequently linked to high systolic blood pressure, which remains poorly controlled across many segments of the population.<sup>8</sup> Research suggests that 54% of stroke episodes worldwide are associated with high blood pressure, and in Egypt, the combination of high prevalence and low control rates makes stroke a leading cause of adult disability.<sup>8</sup>

**TABLE 2: Specific CVD Mortality Rates and Indicators**

Condition	Indicator	Value (2025)	Source
Ischaemic Heart Disease	% of Total Deaths	19.2%	1
Stroke	% of Total Deaths	9.0%	1
Hypertensive Heart Disease	% of Total Deaths	3.2%	1
CVD Deaths	Total Number	275,665	2
eASCVD in T2DM Patients	Prevalence (%)	19.6%	6

Source: Data sourced from.<sup>1</sup>

### The Metabolic Syndrome Nexus Hypertension Diabetes and Obesity

The surge in cardiovascular mortality is inextricably linked to a triad of metabolic risk factors that have reached epidemic proportions in Egypt. These factors—hypertension, diabetes mellitus, and obesity—interact in a synergistic manner, creating a metabolic environment that predisposes the population to premature vascular aging and atherosclerotic progression.

**GRAPH 1: The Metabolic Syndrome Nexus Hypertension Diabetes and Obesity**



Source: Data sourced from.<sup>2</sup>

## Hypertension Prevalence and Management Gaps

Hypertension is a ubiquitous threat in Egyptian society. The age-standardized prevalence of hypertension among adults aged 30 to 79 years is estimated at 38.2%.<sup>1</sup> Historical surveys have suggested even higher rates in specific cohorts, reaching as much as 40.8% among women and 38.7% among men in previous Stepwise Surveys.<sup>10</sup> The critical issue is not only the high prevalence but the vast gap in management. Estimates from 2017 indicated that 71% of hypertensive patients in Egypt were not on any antihypertensive medication.<sup>5</sup>

The impact of high systolic blood pressure (HSBP) on the regional disease burden is profound. In the Eastern Mediterranean Region (EMR), HSBP accounted for an age-standardized death rate of 228.4 per 100,000 population in 2021.<sup>9</sup> While there has been a global and regional decline in age-standardized deaths related to HSBP (a 12.7% decrease in the EMR since 1990), the absolute number of people exposed to high blood pressure continues to rise due to population growth and aging.<sup>9</sup>

## The Rising Prevalence of Diabetes Mellitus

Egypt is currently facing one of the world's most severe diabetes crises. The nation consistently ranks in the top ten globally for both the highest prevalence of diabetes and the highest absolute number of adults living with the condition.<sup>11</sup> In 2024, the total adult population with diabetes was estimated at 13.2 million, representing a prevalence

of 22.4%.<sup>11</sup> This trajectory is projected to reach 24.7 million cases by 2050.<sup>11</sup>

The relationship between diabetes and cardiovascular complications is a primary driver of premature death in Egypt. Diabetes accelerates the development of macrovascular complications, making early screening and intensive management vital.<sup>10</sup> However, the proportion of people with undiagnosed diabetes remains high at 62%, representing nearly 8.2 million individuals who are unaware of their condition and are thus at high risk of silent cardiovascular damage.<sup>11</sup>

## Obesity and the Nutrition Transition

Obesity serves as the foundational risk factor for the metabolic syndrome in Egypt. The country has one of the highest obesity rates globally, with the age-standardized prevalence of obesity among adults (18+ years) reaching 44.3% in 2022, a 59.4% increase since 2000.<sup>1</sup> The gender disparity in obesity is stark: 44.7% of adult women are living with obesity compared to 25.9% of men.<sup>14</sup>

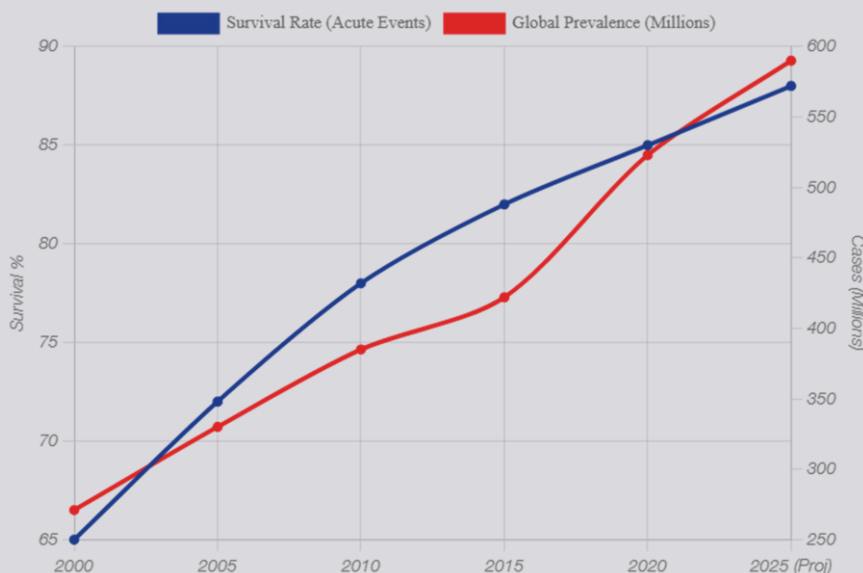
This obesity epidemic is driven by a comprehensive "nutrition transition." There has been a distinct shift from traditional diets—characterized by coarse grains, pulses, and vegetables—to modern, calorie-dense diets high in processed sugars, saturated fats, and fast foods.<sup>13</sup> Economic factors play a role as well; for the lower-income segments of the population, the most accessible and affordable calories are often the most unhealthy.<sup>15</sup> The prevalence of obesity among children and adolescents (aged 5–19 years) has also surged to 20.4%, ensuring that the cardiovascular crisis will persist into future generations.<sup>1</sup>

**TABLE 3: Specific CVD Mortality Rates and Indicators**

Risk Factor	Adult Prevalence (2019–2022)	Trend since 2000	Gender Disparity
Hypertension (30–79y)	38.2%	Stable/Slight Rise	High in both
Diabetes (20–79y)	22.4%	Significant Rise	High in both
Obesity (18+y)	44.3%	+59.4%	Female > Male
Tobacco Use (15+y)	24.7%	+27.3%	Male >> Female

Source: Data sourced from:<sup>5-8</sup>

**GRAPH 2: Specific CVD Mortality Rates and Indicators**



Source: Data sourced from:<sup>9-10</sup>

**Behavioral and Environmental Drivers of CVD**

The high incidence of cardiovascular disease in Egypt is not solely a product of metabolic dysfunction but is also heavily influenced by behavioral choices and environmental exposures. Tobacco use and physical inactivity represent the most significant modifiable behavioral risks, while air pollution has emerged as a critical environmental threat.

**I. Tobacco Use and Cultural Patterns**

Tobacco use remains a significant driver of heart disease and stroke in Egypt. The age-standardized prevalence of tobacco uses among persons 15 years and older was 24.7% in 2022.<sup>1</sup> However, this figure masks a massive gender gap: while male smoking rates are estimated at nearly 50%, the prevalence among adult females remains low (historically around 0.5–0.6%).<sup>5</sup> Despite this, smoking prevalence among adolescent girls is rising, with 3.8% of girls aged 13–15 years using some form of tobacco.<sup>16</sup>

The use of waterpipes (shisha) is a particularly problematic cultural habit. In some EMR countries, waterpipe tobacco smoking has surpassed cigarette smoking among women and adolescents.<sup>16</sup> Dual use—smoking both cigarettes and waterpipes—is common, and there is an increasing trend of electronic nicotine delivery system (ENDS) use among young adult females, who use these products at rates 12 times higher than their male counterparts in some cohorts.<sup>16</sup> Tobacco use is estimated to cause approximately 170,000 deaths annually in Egypt, with substantial economic impacts including health spending and lost productivity.<sup>17</sup>

## **II. Physical Inactivity and Urbanization**

A sedentary lifestyle is another primary driver of the CVD burden. Urbanization in Egypt has led to a reduction in public spaces for exercise and a growing dependence on motorized transport.<sup>10</sup> Studies among medical students at Mansoura University found that 52.9% were physically inactive, and this inactivity was a significant predictor of obesity.<sup>18</sup>

Among older adults (50+ years), the situation is even more critical. Only 30.63% of this population is considered physically active, and 63% adopt a sedentary lifestyle.<sup>19</sup> For adolescents, the figures are similarly concerning; 85% of girls and 75% of boys aged 13–15 years do not meet the recommended 60 minutes of daily physical activity.<sup>20</sup> This widespread lack of activity accelerates the onset of hypertension and diabetes, further tightening the cardiovascular nexus.

## **III. Environmental Impact: Air Pollution**

Ambient and household air pollution represent a non-behavioral but highly influential risk factor. In 2019, the annual mean concentration of fine particulate matter (PM<sub>2.5</sub>) in urban areas of Egypt was 63.2 µg/m<sup>3</sup>, significantly above safe levels.<sup>1</sup> The age-standardized mortality rate attributed to household and ambient air pollution was 105.9 per 100,000 population.<sup>1</sup> Long-term exposure to (PM<sub>2.5</sub>) is a known risk factor for ischemic heart disease, particularly among the elderly, and projections suggest that this environmental burden will continue to exacerbate the cardiovascular health of older adults.<sup>21</sup>

## **IV. Pediatric and Adolescent Cardiovascular Risk**

The roots of the adult cardiovascular crisis in Egypt can be found in the pediatric and adolescent populations. The coexistence of stunting and obesity—the "double burden of malnutrition"—creates a unique and challenging health profile for Egypt's youth.

## **V. Nutritional Habits and Malnutrition Facts**

In 2025, a nationwide study of adolescents aged 10–14 revealed that 37.5% were overweight or obese, while 18.4% were stunted.<sup>22</sup> This high rate of stunting is linked to poor consumption of milk and dairy products, while obesity is driven by late-night snacking, frequent consumption of fried potatoes, and excessive screen time.<sup>22</sup> These habits are established early; many Arab adolescents skip breakfast (52% to 82%) and have low daily intakes of fruits (22% to 50%) and vegetables (10% to 50%).<sup>20</sup>

**TABLE 4: Adolescent Lifestyle Habits and CVD Markers**

Habit/Indicator	Percentage in Adolescents	Impact on Future Health
Overweight or Obese (10-14y)	37.5%	Increased risk of early-onset HTN and T2DM
Stunting (10-14y)	18.4%	Metabolic vulnerability to weight gain
Skip Breakfast Daily	52% - 82%	Poor cardio-metabolic health markers
Fast Food (≥ 3 days/week)	16% - 35%	High saturated fat and sodium intake
Sugar-Sweetened Drinks (≥ 3 d/w)	45% - 67%	Drive for insulin resistance
Physically Inactive	75% - 85%	Foundation for sedentary adult life

Source: Data sourced from.<sup>20</sup>

These early-life exposures are critical because blood pressure and glucose levels in childhood are highly correlated with those in adulthood.<sup>23</sup> The prevalence of hypertension among secondary school students (17.51%) is a clear signal that the transition from pediatric health to adult NCDs is occurring prematurely in the Egyptian context.<sup>23</sup>

### Regional Disparities and Healthcare Infrastructure

The burden of cardiovascular disease in Egypt is not uniform across its geography. Socioeconomic variations, access to specialized care, and environmental differences between the urban north and the more rural south create distinct regional health profiles.

### Urban vs. Rural Health Dynamics

Urban areas like Cairo, Alexandria, and Giza are characterized by high rates of "lifestyle" NCDs. These trends are primarily attributed to urbanization, sedentary occupations, and the replacement of traditional meals with calorie-dense fast foods.<sup>10</sup> In contrast, rural areas, particularly in Upper Egypt and the Nile Delta, continue to face significant challenges from Rheumatic Heart Disease (RHD).

RHD remains a major cause of death and disability in rural regions where access to primary care for streptococcal infections is limited. In 2017, there were an estimated 628,681 cases of RHD in Egypt.<sup>5</sup> In rural populations, RHD accounts for nearly 25% of all heart failure cases.<sup>10</sup> Socioeconomic disparities are evident; the rural areas of Upper Egypt lag behind the rest of the country in access to health services and specialized cardiac care, such as percutaneous coronary intervention (PCI) centers.<sup>5</sup>

### Regional Variations in Hospitalized Heart Failure (HHF)

Studies of hospitalized heart failure patients across four major regions (Alexandria, Cairo, Delta, and Upper Egypt) reveal stark differences in patient demographics and disease etiology. Patients in Alexandria and Cairo tend to be older and present with higher rates of ischemic heart disease, hypertension, and chronic kidney disease.<sup>25</sup> In contrast, HHF patients from Upper Egypt are significantly younger (mean age 51.2 years) and show a higher prevalence of valvular heart disease and severe anemia (nearly 80% of patients).<sup>25</sup>

**TABLE 5: Demographics and Comorbidities of HHF Patients by Region**

Parameter	Alexandria	Cairo	Delta	Upper Egypt
Mean Age (Years)	62.3	56.2	59.9	51.2
Obesity (BMI ≥ 30) (%)	48.7	40.2	46.2	19.2
Hypertension (%)	51.8	26.2	34.5	17.8
Ischemic Etiology (%)	72.5	53.4	61.4	40.9
Valvular Etiology (%)	6.2	18.2	5.9	25.4
Severe Anemia (Hb ≤ 12) (%)	57.5	53.3	61.1	79.4
1-Year Mortality (%)	31.8	-	13.2	-

Source: Data sourced from.<sup>25</sup>

The disparity in one-year mortality between Alexandria (31.8%) and the Delta (13.2%) suggests that the intensity of risk factors and the quality of post-discharge follow-up vary significantly between administrative governorates.<sup>26</sup>

**Public Health Response:  
The 100 Million Healthy Lives Initiative**

In response to these escalating threats, the Egyptian state launched the "100 Million Healthy Lives" (Meet Milyon Seha) campaign in 2018. This presidential initiative is one of the largest public health screening campaigns in history, initially designed to eliminate Hepatitis C but rapidly expanded to address the mounting burden of noncommunicable diseases.<sup>27</sup>

**Screening Outcomes and NCD Management**

The campaign utilized nearly 6,000 fixed testing sites and 8,000 mobile teams to screen over 60 million people for Hepatitis C, blood pressure, blood sugar levels, and BMI.<sup>28</sup> This massive effort allowed for the creation of a nationwide NCD database and heat maps, enabling health authorities to target interventions strategically.<sup>28</sup>

As of August 2025, the "Albak Amana" campaign, a specialized program within the initiative, has reported significant success in early detection and management of cardiovascular risk factors. Between February 2023 and August 2025, the campaign delivered:

- 343,633 diabetes patient screenings and follow-ups.
- 307,431 hypertension screenings.
- 300,232 dual cases of hypertension and diabetes.
- 269,111 ECG screenings.
- 440,481 comprehensive cardiovascular risk assessments.<sup>29</sup>

Additionally, 401 primary healthcare units have been equipped with advanced medical devices across 21 governorates, and thousands of medical professionals have been trained in modern clinical protocols.<sup>29</sup> These initiatives represent a shift in the national health paradigm from reactive, hospital-based care toward proactive, primary-care-based prevention.

## National Health Strategy 2024–2030 and Targets

The National Health Strategy for 2024–2030 provides a roadmap for sustaining these gains. The strategy aims to achieve Universal Health Coverage (UHC) and significantly reduce NCD-related mortality.<sup>30</sup> Egypt has already implemented 7 out of 8 key CVD-related policies recommended by the World Heart Federation, including a national action plan and a dedicated NCD operational unit within the Ministry of Health.<sup>2</sup>

Specific targets set for 2025 and 2030 include:

- Reducing premature mortality from NCDs by 20% by 2025 and by 1/3 by 2030.
- A 10% relative reduction in physical inactivity by 2025.
- A 30% relative reduction in salt/sodium intake by 2025.
- A 20% reduction in tobacco use by 2025.
- Limiting industrially produced trans fats to 2g per 100g of total fat, with enforcement mandatory as of 2024.<sup>30</sup>

## Therapeutic Innovation: Cardiotriton® as a Targeted Nutritional Add-On

Addressing the physiological and metabolic gaps identified in the Egyptian population requires innovative therapeutic tools that go beyond traditional pharmacological interventions. Cardiotriton® Booster serves as a specialized, "Golden Smart Add-On" designed to integrate with standard medical therapy to enhance clinical outcomes for chronic, acute, and post-operative patients.

## Addressing Myocardial Bioenergetics and Oxidative Stress

The core therapeutic value of Cardiotriton® lies in its ability to support myocardial bioenergetics—the production of cellular energy (ATP)—while simultaneously neutralizing the oxidative stress that characterizes the "diabetic heart" and hypertensive vascular damage prevalent in Egypt.

- **Liposomal Co-enzyme Q10:** This is the primary catalyst for ATP production within heart cells.

Utilizing advanced liposomal technology, Cardiotriton® ensures an absorption rate five times higher than conventional CoQ10 supplements, essentially refilling the "ATP batteries" in exhausted heart muscles.

- **Liposomal Alpha Lipoic Acid (R-ALA):** Known as a metabolic shield, R-ALA functions within the mitochondria to protect against glucose-induced cellular damage and inflammation. This is particularly critical for the approximately 99% of diabetic Egyptians who fall into high or very high cardiovascular risk categories.
- **Acetyl L-Carnitine:** To combat the obesity-driven "lipotoxicity" observed in 44.3% of adult Egyptians, this ingredient triggers the metabolism of stored fatty acids within the heart muscle, converting them into functional energy (the "Fat-to-Fuel" process).

## Clinical Integration for Specialized Patient Categories

Cardiotriton® Booster is categorized to provide tailored support across the spectrum of cardiovascular care identified in this report:

1. **Chronic and Metabolic Patients:** For those with hypertension and metabolic syndrome, the formula improves vascular elasticity and reduces systemic resistance, helping the heart work more efficiently against the "stiffening" caused by high blood pressure.
2. **Post-Operative and Acute Recovery:** Following procedures like catheterization (stents) or open-heart surgery—which often subject the heart to "reperfusion injury"—Cardiotriton® fuels cell repair. Clinical studies have shown that its active ingredients can reduce the incidence of post-operative arrhythmias (like atrial fibrillation) by up to 67%.
3. **Chronic Cardiac Fatigue (NYHA I-II):** For patients experiencing the "Mitochondrial Starvation" typical of early heart failure, the targeted delivery system provides instant bioavailable fuel to reduce shortness of breath and physical fatigue.

## Technological Delivery: CardioDrone® and Innova3®

The effectiveness of Cardiotritition® is reinforced by two groundbreaking delivery systems designed for maximum precision. **CardioDrone® Technology** utilizes dual-ligand targeting peptides that act like a "smart GPS," guiding active ingredients directly to heart tissue. This is complemented by the **Innova3® Liposomal Delivery System**, which protects molecules during digestion for sustained release and prolonged mitochondrial support, ensuring that the therapeutic benefits are maintained throughout the patient's recovery and stabilization phases.

## Clinical Challenges and Healthcare Personnel

Despite these policy successes, Egypt faces systemic challenges in the delivery of cardiovascular care. These range from infrastructure disparities to a crisis in the medical workforce.

## Training and Brain Drain

There are two primary pathways for cardiology training in Egypt: a clinical-academic doctorate pathway through university hospitals and a professional five-year Egyptian Fellowship of Cardiology at public hospitals.<sup>5</sup> However, the healthcare system is struggling with a "brain drain" of qualified physicians. Low salaries, high-stress working conditions, and an increasing migration of medical staff led to a physician density of only 0.8 per 1,000 population in 2014.<sup>5</sup>

Recent studies have highlighted the extreme stress placed on junior medical staff. Resident physicians in Egypt are highly vulnerable to CVD due to long shifts

By 2050, the prevalence of diabetes in Egypt is expected to reach 25.7%, affecting over 24 million adults.<sup>11</sup> This rise in diabetes will inevitably lead to a higher incidence of eASCVD and related complications like chronic kidney disease and heart failure. The "nutrition transition" and high rates of

and sedentary lifestyles within the hospital setting.<sup>33</sup> Since 2021, there have been increasing reports of sudden deaths among junior physicians after long shifts, pointing to a systemic failure to protect the health of those providing care.<sup>33</sup>

## Access to Specialized Care

While major cities like Cairo and Alexandria have seen an increase in specialized PCI centers, access remains extremely limited in underserved rural regions. Charities like the Aswan Heart Centre provide high-quality, free cardiac care to the population of Upper Egypt, yet the overall need far exceeds the capacity of such specialized centers.<sup>5</sup> Research and clinical practice integration is also a pressing need, with more coordinated efforts required to modernize nursing schools and establish centers of excellence in the most remote areas.<sup>5</sup>

## Future Projections and Long-term Burden

The future trajectory of cardiovascular disease in Egypt is one of mounting pressure. Without sustained and enhanced intervention, the absolute number of CVD-related deaths and disability-adjusted life years (DALYs) will continue to rise, even if age-standardized rates remain stable or decline.

## Projections for 2030–2050

Globally, the crude cardiovascular mortality rate is expected to rise by 73.4% by 2050, primarily driven by population aging.<sup>34</sup> For Egypt, this means that even if primary prevention efforts are successful, the sheer volume of elderly citizens will demand an unprecedented expansion of cardiac care services. Ischemic heart disease will remain the leading cause of death, while high systolic blood pressure will continue to be the primary metabolic driver of mortality.<sup>34</sup>

childhood obesity suggest that the cohort of Egyptians reaching age 40 in 2050 will have a more severe metabolic profile than their predecessors, potentially leading to an earlier onset of heart disease.

**TABLE 6: Summary of Future Health Targets**

Target Goal (NCDs)	Baseline	2025 Target	2030 Vision
Premature NCD Mortality	High	-20%	-33%
Physical Inactivity	High	-10%	-15%
Salt/Sodium Intake	>4g/day	-30%	Alignment with WHO
Tobacco Use Prevalence	24.7%	-20%	Further Reduction
Industrial Trans Fats	Unregulated	2g/100g Limit	Elimination
Life Expectancy	69.1y	-	75.0y

Source: Data sourced from.<sup>30</sup>

### Conclusion

Cardiovascular disease and its associated metabolic risk factors represent the most significant threat to the health and prosperity of the Egyptian people. The data reveals a nation at a crossroads: while groundbreaking public health initiatives like the "100 Million Healthy Lives" campaign have achieved unprecedented screening success and created a robust foundation for NCD management, the structural drivers of the epidemic—tobacco use, sedentary lifestyles, and a deteriorating nutritional landscape—remain entrenched.

The regional disparities between the urban north and rural south necessitate a multi-modal approach to care, addressing both the "lifestyle"

ischemic disease of the cities and the persistent valvular heart disease of the countryside. Furthermore, the early onset of metabolic risk factors in adolescents indicates that the window for meaningful intervention begins in childhood. Sustaining the progress made through the 2024-2030 National Health Strategy will require not only political will and infrastructure investment but also a fundamental shift in the social and cultural norms surrounding diet, exercise, and tobacco. Without these changes, the economic and human costs of cardiovascular disease will continue to climb, shadowing Egypt's demographic and developmental aspirations for 2050.<sup>35-38</sup>

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# CARDIOTRITION®

## OUR GLOBAL BUSINESS

### MENA REGIONAL OFFICE – EGYPT

28H/1 Shokry Abd El Halim St. New  
Maadi Cairo, Egypt

**Tel:** + 02 106 9529952

[Info@nanotrition.tech](mailto:Info@nanotrition.tech)

#### Technical Inquiries

[mena.tech@nanotrition.tech](mailto:mena.tech@nanotrition.tech)

#### Sales Inquiries

[mena.sales@nanotrition.tech](mailto:mena.sales@nanotrition.tech)

#### Nanotrition Nord

[www.nanotrition.tech](http://www.nanotrition.tech)

### HEAD OFFICE

Forskningsparken, Raveien ,205

3184 Borre,Norway

Tel:+ 47 968 05 160

[norway@nanotrition.tech](mailto:norway@nanotrition.tech)

### RUSSIA

P.O. Box 5 ,198035 Gapsaleskaia St.,

Saint-Petersburg, Russia

Tel: + 7 904 601 23 23

[Info@nanotrition.tech](mailto:Info@nanotrition.tech)

[www.Cardiotrition.com](http://www.Cardiotrition.com)

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