



Public Health in the United Arab Emirates and Ras Al Khaimah

Introduction

Established on December 2, 1971, the United Arab Emirates (UAE) is a federation of seven emirates (Abu Dhabi, Ajman, Dubai, Fujairah, Ras Al Khaimah, Sharjah, and Umm Al Quwain). The discovery of oil drove significant economic and industrial growth in the UAE, which has impacted the demographic landscape of the nation.

Population growth in the UAE is currently reported to be among the highest in world, with census data recording a seven-fold increase in population between the years of 1975 and 2005 (Population of the UAE, 2014). The fact that this growth is bolstered by an influx of migrant workers, coupled with the high percentage of men working in the expansive construction industry, means that a large portion of the demographic are pre-retirement age males. In fact, 95% of the U.A.E. population is less than 50 years of age, with a 3:1 male-female ratio in the 25-50 year age group (U.A.E. National Bureau of Statistics, 2012).

While by 2010 87% of the UAE's population of 8.3 million were expatriates, certain government-provided benefits remain available solely to Emirati citizens (U.A.E. National Bureau of Statistics, 2012). These benefits extend to areas of education and health care and fuel debates on equity and access for a population that is predominantly expatriate. This report represents an overview of public health in the UAE, in the context of the country's unique historical, cultural, and socioeconomic landscape.

International Public Health Models

The main focus of public health policy development today is the provision of universal health coverage. In the 2013 World Health Report, the World Health Organization (WHO) defines universal health coverage as a system that "ensures everyone has access to the health services they need without suffering financial

hardships as a result” (WHO, 2013). The starting point for this effort is the establishment of an efficient health care model, which can serve as an instrument for policymakers to achieve targeted goals, such as improved health outcomes, equity, and public satisfaction.

Figure 1 below is Frieden’s 5-tier health impact pyramid, which illustrates the various levels of intervention required by a reliable and efficient universal public health care system.

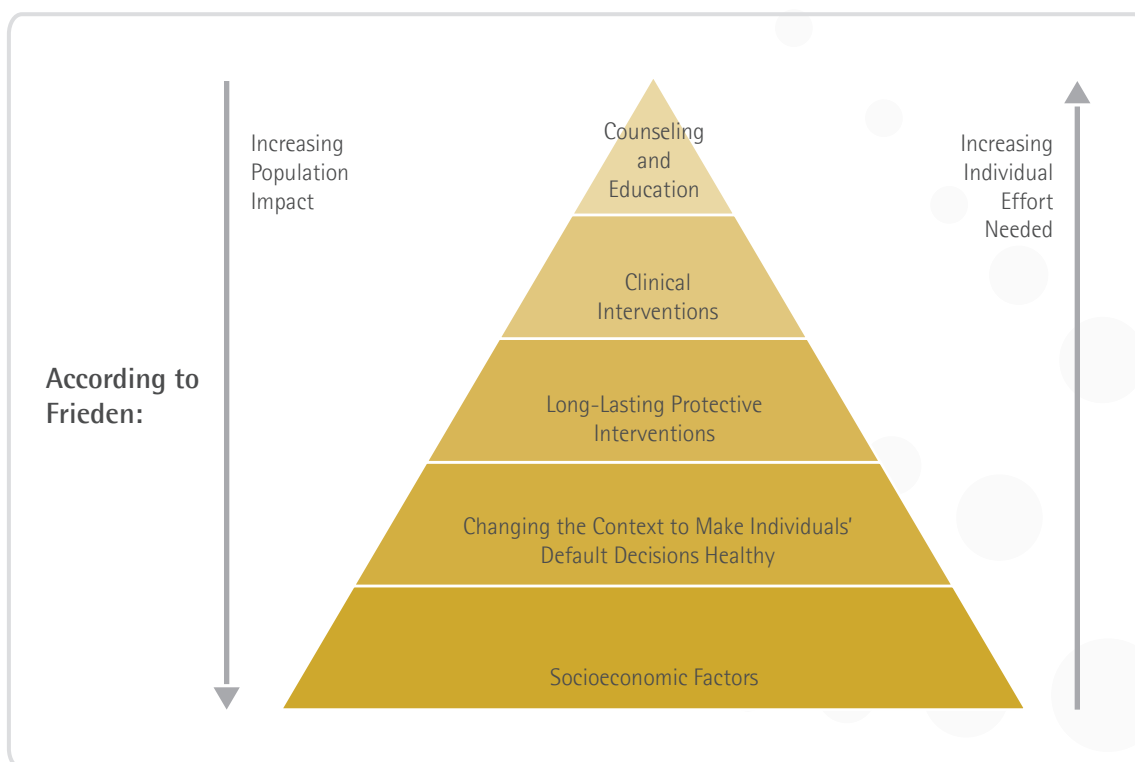
In this pyramid, efforts to address socioeconomic determinants are at the base, followed by public health interventions that change the context for health (e.g., clean water, safe roads); protective interventions with long-term benefits (e.g., immunizations); direct clinical care; and, at the top, counseling and education. In general, public action and interventions represented by the base of the pyramid require less individual effort and have the greatest population impact. Interventions at the top tiers are designed to help individuals rather than entire populations, but they

could theoretically have a large population impact if universally and effectively applied. (Frieden 2010, p. 591)

Public health care systems in France, Germany, the United Kingdom (UK), and Canada address each section of this impact pyramid (Brown, 2003; Commonwealth Fund, 2012; Altenstetter, 2003). Of particular interest is the success of the French health care system, which provides universal access to residents and citizens alike, at a low relative per capita health expenditure (WHO, 2013).

On the other side of the aisle is the United States’ (US’s) health care system, which, like the UAE’s, relies largely on privately purchased insurance. The U.S. health care system is often criticized for a lack of equality in access and quality of care, missed prevention opportunities, and unnecessary administrative costs (Organization for Economic Co-operation and Development [OECD], 2005; Davidson, 2010; National Academies Institute of Medicine, 2012). The section thus provides a comparative overview of generally commended and criticized models to put the UAE’s public health system in the context of international benchmarks.

Figure 1: Health Impact Pyramid



Source: Based on Frieden, 2010

France

The French health care system is praised for its balance between the nationalized and “over-rationed” National Health Service (NHS) of the UK and the competitive model of the US, in which many believe that too few people have access to health insurance (Brown, 2003). Financing of the French health care system comes through tax revenues and social health insurance contributions from employers and employees.

All legal residents of France are automatically enrolled in an insurance fund based on occupational status and place of residence. Ninety percent of the population obtains supplementary insurance to gain access to benefits not covered by the French National Health Insurance (Sandier, 2002). All diagnostic and curative procedures carried out in public hospitals are covered by a national budget. Patients have a free choice in selecting providers: patients can visit any General Practitioner (GP) or specialist practicing privately or working in hospital outpatient departments, without referral requirements or limit on the number of consultations.

United States of America

According to the OECD, the US is the last remaining industrialized country without an established form of universally accessible health care (Light, 2003). Private sector businesses account for the majority of health care facilities in the US, where 20% of hospitals are government-owned and 18% of hospitals are for-profit (Rosenthal, 2013). Despite the large privatization of health care in the US, a WHO report published that the country spent more on health care per capita, and more on health care as a percentage of its GDP, than any other nation in 2011 (WHO, 2011). Thus, the U.S. model is frequently criticized for its high cost, low accessibility, and lack of efficiency (Bloomberg, 2013).

Eighty-five percent of the U.S. population has access to medical coverage, the majority of which is provided by employers or family members’ employers. According to a comparative report highlighting the shortcomings of U.S. health care, the unrepresented 15% are neither organized, nor cohesive, nor politically active, and they cannot be grouped into an identifiable category (Brown, 2003).

United Arab Emirates

The UAE is one of the 58 countries worldwide that has a universal health care program (Bump, 2010). The U.A.E. government is committed to the WHO’s constitution stipulating that health is a basic right and is working towards the objective of providing an accessible and equitable health system.

As a young nation, the UAE is undergoing developmental evolution, and the government remains concerned with drawbacks of the existing health system such as the cost and quality of services and the scarcity of choices available. Approximately 67% of health expenditure in 2012 came from public sources. The Ministry of Health (MoH) consistently allocated an average of 7.7% of total government budget between the years of 1982 and 2011 to health care (WHO, 2006). Private health insurance companies cover the remainder of health financing in the country (World Bank, 2012).

Despite what is technically a universal health plan, private insurance is the primary means of coverage for most of the UAE’s population. The government provides free medical care and treatment to U.A.E. nationals. However, limited resources and demands in standards and quality control have skewed some preference towards the private sector. Non-Emirati residents do not have access to any free public health services, although, in 2013, the MoH introduced a series of health cards available to expatriates at an annual fee of AED 500, which give access to subsidized consultation and treatment charges at government hospitals (The National, 2013).

In addition, employers or sponsors of all non-national U.A.E. residents are obligated to provide comprehensive health insurance to employees and their families, with renewal of residence visas voided in the absence of appropriate health coverage. The regulation aims to minimize out-of-pocket health expenses for U.A.E. residents, yet it gives a greater degree of power to the private sector.

Table 1: Comparative Summary of Public Health Care Spending and Provisions in Six Countries

Country	% GDP spent on health	Source of funding	Complimentary public services available	Free services available to non-citizens?
France	11.7	Tax	Primary care, maternity, dental, geriatric	Yes
Germany	11.3	Tax, government funds	Primary care, secondary care, maternity, dental, geriatric, rehabilitative care	Yes
UK	9.4	Tax, government funds, charitable funds	Primary care, secondary care, maternity, dental, geriatric, rehabilitative care, preventative care	Yes
Singapore	4.7	Government-enforced insurance program	Primary care	No
USA	17.9	Private funds, nominal public funds	None	No
UAE	2.8	Private funds, nominal public funds	Free primary care, secondary care, maternity and geriatric care to citizens only	No

Public Health in the UAE: An Overview of Supply

The U.A.E. government envisions the establishment of a comprehensive health care system that is available to all residents, is capable of providing adequate health services within the Emirates, and will eventually serve as a focal point for quality health care in the region (Owais, 2014; Dubai Health Authority, 2014).

By the time the MoH was established in 1972, the UAE hosted a total of seven public hospitals. Federal law gave the MoH the role of licensing all health care providers, regulating medical practices, and managing health care services (U.A.E. National Societies of Public Welfare). Through federal policies, U.A.E. citizens are provided with health care, preventive awareness, and social care.

According to a report published by the WHO Regional Office for the Eastern Mediterranean (EMRO),

“Until 1982, all [U.A.E.] residents received free medical care. In that year, escalating costs, shrinking oil revenues, and a change in attitude toward foreign residents caused the UAE to begin charging non-citizens for all services except emergency, child, and maternity care. By the early 1990s, the quality of available health care in the Emirates had improved, but the system remained largely fragmented, with oil companies and the military having their own separate medical facilities.” (EMRO, 2010)

In 2001, the government of Abu Dhabi set up the General Authority of Health Services (GAHS) to oversee all matters pertaining to public health institutions in the emirate (Latham & Watkins, 2013). The GAHS was later restructured into the Health Authority—Abu Dhabi (HAAD) and the Abu Dhabi Health Services Company (SEHA). The former was responsible for regulating policy and the latter for managing the government-owned health care facilities (SEHA, 2008). This series of actions set the emirate of Abu Dhabi apart from the rest of the Federation in

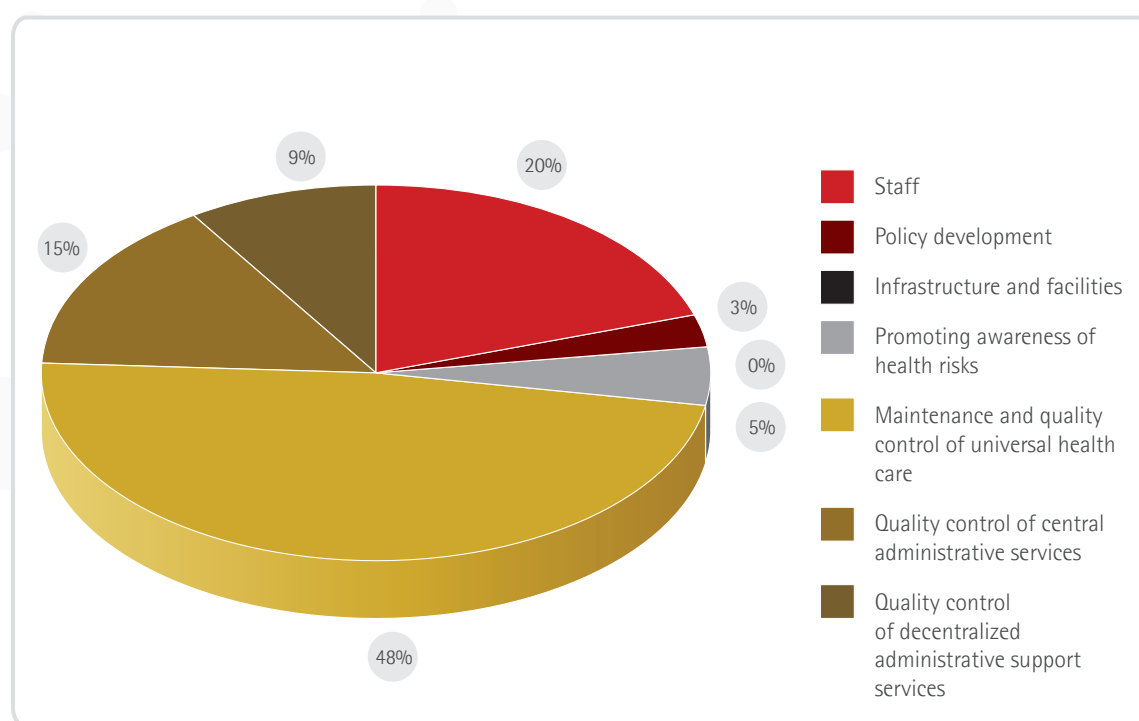
terms of health care and spring-boarded its expansion into a system with comprehensive coverage and high-quality services that meet international standards (Salem, 2013). HAAD policies have led to the implementation of numerous preventative actions in the emirate, such as population-based public awareness campaigns, cancer screening programs, and an online facility called Weqaya, which encourages the self-assessment of lifestyle habits and activities that contribute to some of the most common health problems in the UAE (e.g., diabetes and cardiovascular disease). SEHA, on the other hand, manages 12 hospitals, 57 primary health care centers (PHCs), and a wide range of outpatient services including x-rays, mammograms, electrocardiograms (ECG), and physical therapy via a network of ambulatory care clinics made accessible to all residents of Abu Dhabi (SEHA, 2014).

At the same time that the GAHS was restructured, His Highness Sheikh Mohammed bin Rashid Al Maktoum, ruler of Dubai, launched the Dubai Health Authority (DHA) with the objective of improving health care infrastructure and encouraging health care investment in Dubai. The DHA manages four hospitals, 20 PHCs, and numerous specialty centers with focuses on thalassemia, gynecology, diabetes, and geriatrics (Dubai Health Authority, 2014).

In addition to the government-provided DHA, the Dubai Health Care City (DHCC) is a health care free zone that was launched in 2002 with the purpose of being responsible, among other things, for the development of medical and paramedical colleges and universities, research centers, specialized health-related facilities, and pharmaceutical companies. The DHCC currently contains two hospitals and over 120 outpatient medical clinics and diagnostic laboratories, and its nature as a free zone authority precludes it from the 2012 licensing and disciplinary framework set out for medical practices and professionals by the Dubai Executive Council (Latham & Watkins, 2013).

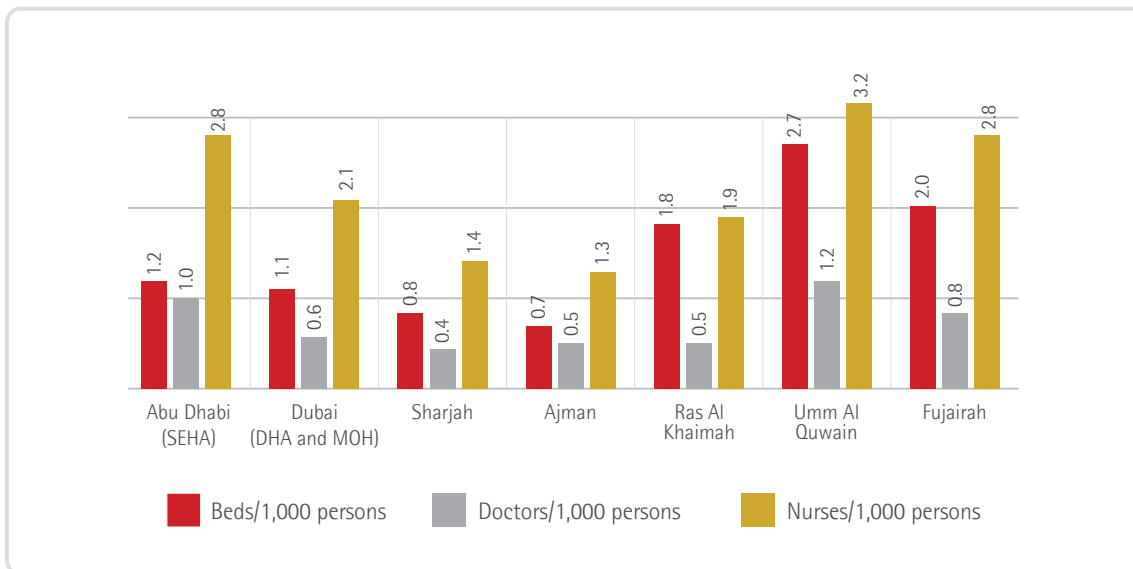
Subsequent to the establishment of individual emirate-based health care authorities by Abu Dhabi and Dubai, the focus of the MoH was shifted to the northern emirates (Ajman, Fujairah, Ras Al Khaimah, Sharjah, and Umm Al Quwain). In 2011, the MoH launched a strategic plan designed to enhance standards of health care, increase preventative action through public and community awareness, and to encourage investment in supporting medical and scientific research (U.A.E. Ministry of Health, 2011). Figure 2 shows a breakdown of the budget allocations as described by the MoH for the year 2012 (U.A.E. Ministry of Health, 2012).

Figure 2: U.A.E. Ministry of Health 2012 Budget Expenditures



Source: U.A.E. Ministry of Health, 2012

Figure 3: Public Health Resources per 1,000 Persons by Emirate



Source: U.A.E. National Bureau of Statistics, 2012

Public health care services are therefore administered by three different regulatory authorities in the UAE: the HAAD in the capital, the DHA and the MoH in Dubai, and the MoH in the northern emirates. These three authorities have the task of planning and implementing changes in infrastructure and policy to bring about improvements in the state of public health and reduce the cases of chronic disease and

premature mortality. Some of the most important standard variables linked with curbing mortality rates include provisions such as personnel and capacity (National Audit Office, 2012). Figure 3 is a comparison of the public health resources and personnel available across the emirates per 1,000 individuals in the year 2012, while Figure 4 compares the 2012 national averages of several developed countries.

Figure 4: Public Health Resources per 1,000 Persons by Country



Source: WHO, 2011

As seen in Figure 4, the UAE's public facilities fall below international standards in terms of accessibility to health resources. Aggressive investment in quality staffing and infrastructure development is needed in order for the universal health care system of the UAE to surpass the private sector in providing reliable and accessible services (Loney, 2013).

Despite government efforts to modernize the health care system by creating new authorities and issuing new regulations in the last decade, the division of powers and authorities among the various regulatory entities (between the federal- and emirate-levels, as well as between the various lateral entities) remains unclear in certain areas. In particular, overlaps exist between the different authorities in relation to licensing as well as to the monitoring and control of medical institutions. In light of the heavy reliance on the private health care sector, policies for health regulation and licensing are extremely important. The UAE's critical health challenges are in the areas of strengthening the organization of health services, health financing, resources for health, and health education (Ortashi, 2013).

Public Health in Ras Al Khaimah

Over the past ten years, the economy of Ras Al Khaimah has grown rapidly, and areas of public health are following suit in terms of expansion, but at a slower pace. A contact at the Public Health Care division of the Ras Al Khaimah Ministry of Health claims that local public health in the emirate has not kept up with economic development in recent years (G. M. Rao, personal communication, March 4, 2014).

Unlike Dubai and Abu Dhabi, which have independent bodies (DHA and HAAD respectively) administering public health care, Ras Al Khaimah's public health care system falls under the management of the Federal Ministry of Health. Since 2010, three new government hospitals have been built in the emirate (Sheikh Khalifa Hospital, Al Nakheel Hospital, and Abdullah Rashid Omran Hospital in Humraniya). In addition to this, recent years have seen the set-up of small mobile medical units to cater to patients in remote areas of the emirate. Government hospitals are open to holders of government health cards and to non-card-holders for emergencies only. Government hospital services are offered free of charge to Emirati

citizens with government-issued health cards, while expatriate residents are charged nominal, subsidized rates for consultations and treatments.

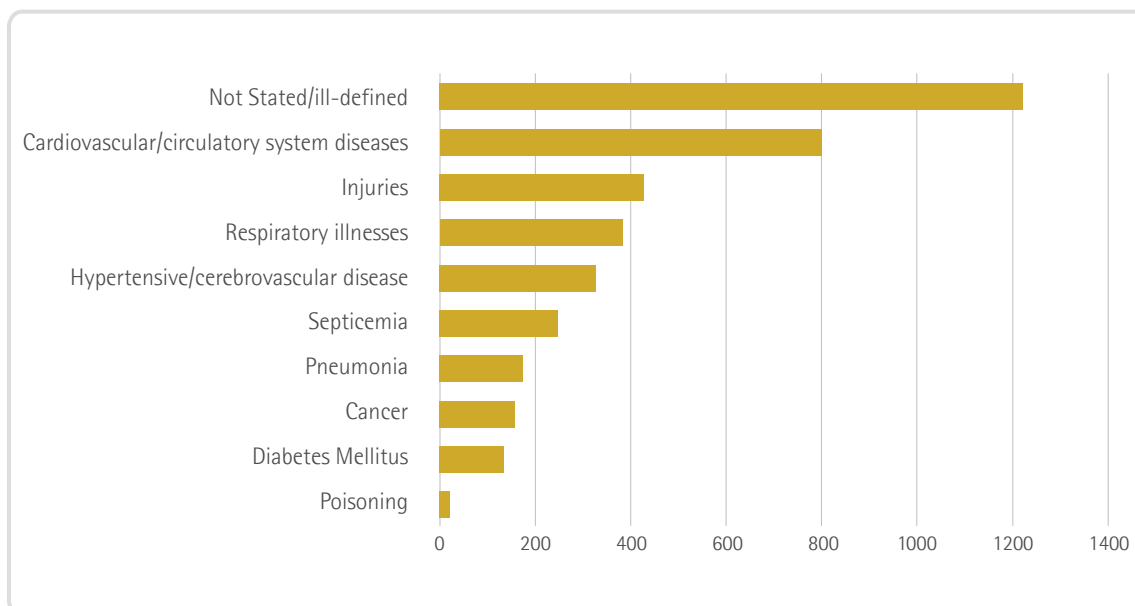
The perspective of an official of the Primary Health Care (PHC) department of the Ministry in Ras Al Khaimah sheds light on the recent developments seen in Ras Al Khaimah's public health landscape. Since 2011, there has been an introduction and expansion of new public health services, both preventative and curative. These include regular home visits for geriatric patients and those who return home after recovering from surgery or other inpatient visits. The MoH-enforced genetic health program encourages future parents to educate themselves about risks associated with consanguinity and offers free blood tests. School visits from members of the MoH are scheduled several times in the school year to spread awareness on dental health, nutritional health, and hygiene (RAK PHC official, personal communication, February 13, 2014).

During the same interview, on the topic of areas of demand, emphasis was placed primarily on infrastructure shortages. Remote areas of the emirate, inhabited by farmers and traditional indigenous populations, remain largely inaccessible. Administrators expressed particular concern for the lack of access to emergency and hospital services in remote locations.

PHC administrators identified the need for a larger number of qualified doctors and nurses as the second biggest challenge. As one administrator explains, "the mobile clinics and emergency care clinics are there, but what is the point if there is only one doctor and a long line of people needing treatment?" (RAK PHC administrator, personal communication, February 13, 2014)

In addition, according to representatives of the Ras Al Khaimah Primary Health Care department, many medical facilities severely need updates related to their medical tools and equipment, as well as to the state of hospital and clinic buildings. With the conditions of the older and outdated facilities being as they are, private health care options are, as in other emirates, more popular options in Ras Al Khaimah.

**Figure 5: Causes of Premature Mortality in the UAE
(Per Every 5,000 Cases)**



Source: U.A.E. Ministry of Health, 2012

Health Care Priorities in the UAE

Since 1971, the lifestyle of the local population has shifted from a traditional and semi-nomadic way of life to an urbanized regime characterized by reduced occupational physical activity and a heavy reliance on domestic help and vehicular transport (International Monetary Fund, 2012). Coupled with diets now heavy in high-sugar and high-sodium processed foods, these changes have adversely affected the local population—increasing rates of chronic, preventable, lifestyle-related health problems (Loney, 2013).

A survey conducted by the U.A.E. University Institute of Public Health (Loney, 2013) in 2013 highlighted the top priorities areas in U.A.E. health care as (in order of importance):

1. Cardiovascular diseases
2. Injury (including road traffic accidents and occupational injuries)
3. Cancer
4. Respiratory illnesses

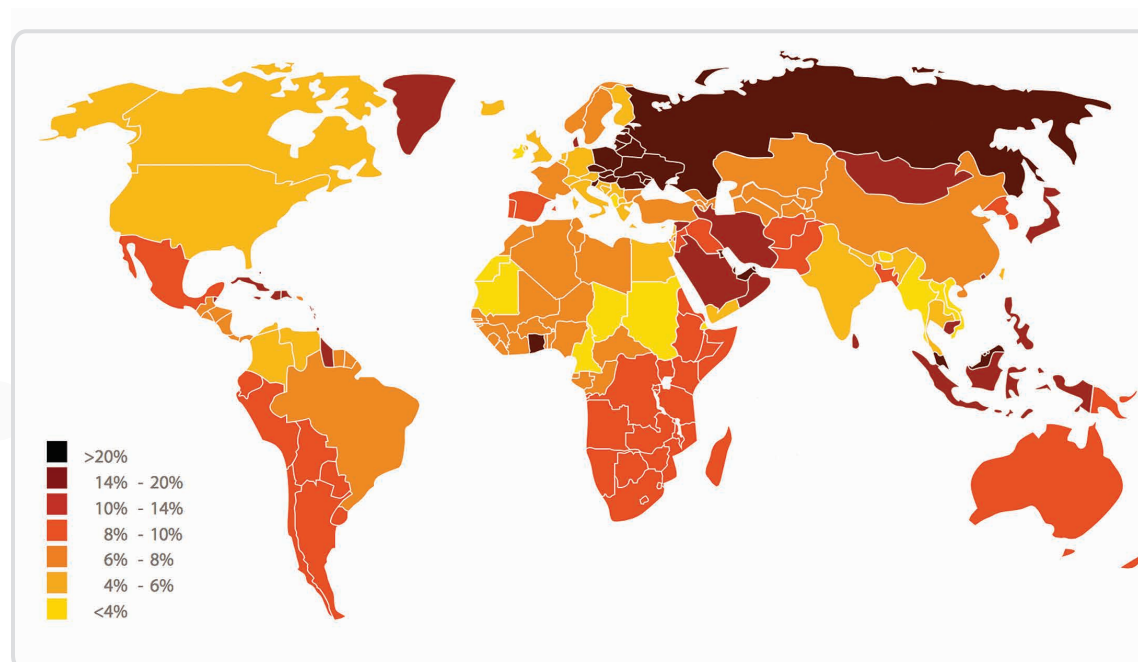
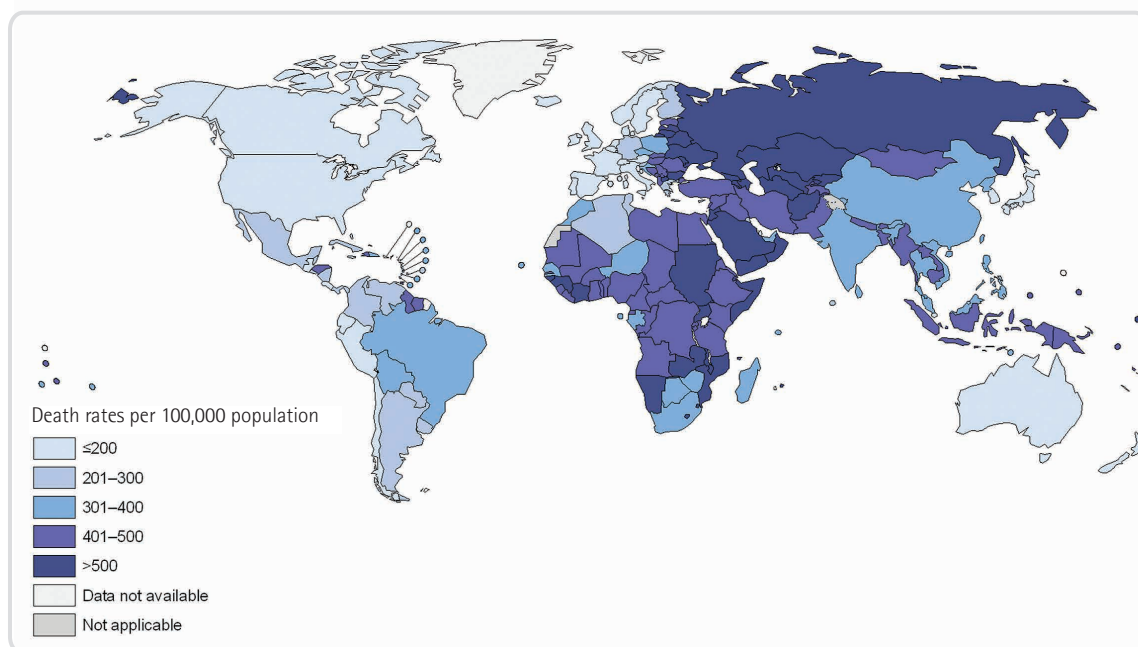
MoH statistics reveal that cardiovascular diseases, respiratory illnesses, and injuries rank among the highest causes of premature mortality in 2012 (Figure

5). Experts predict an increase in the demand for services in these areas over the next 10 years, but this demand could be controlled by curbing underlying risk factors such as tobacco consumption, unhealthy diet, and inadequate physical activity. Changing the attitudes toward healthy lifestyles among the local population is, thus, a high strategic priority for the emirates; various government bodies are investing in a number of campaigns aimed at spreading awareness about the importance of exercise and healthy diet.

Lifestyle Diseases

Poor lifestyle habits such as unhealthy diet, low physical activity, and smoking lead to a number of chronic and often life-threatening medical conditions, including obesity, diabetes, and lung diseases, all of which are linked to increased risk of developing the world's primary cause of premature death: cardiovascular diseases (CVDs) (WHO, 2013). As an example, Figure 6 illustrates the link between high incidences of CVD-related deaths (a) and prevalence of diabetes (b).

Figure 6: Global Incidence of CVD-related Deaths (a) and Statistics of Global Diabetes Prevalence as Projected for the Year 2025 (b)



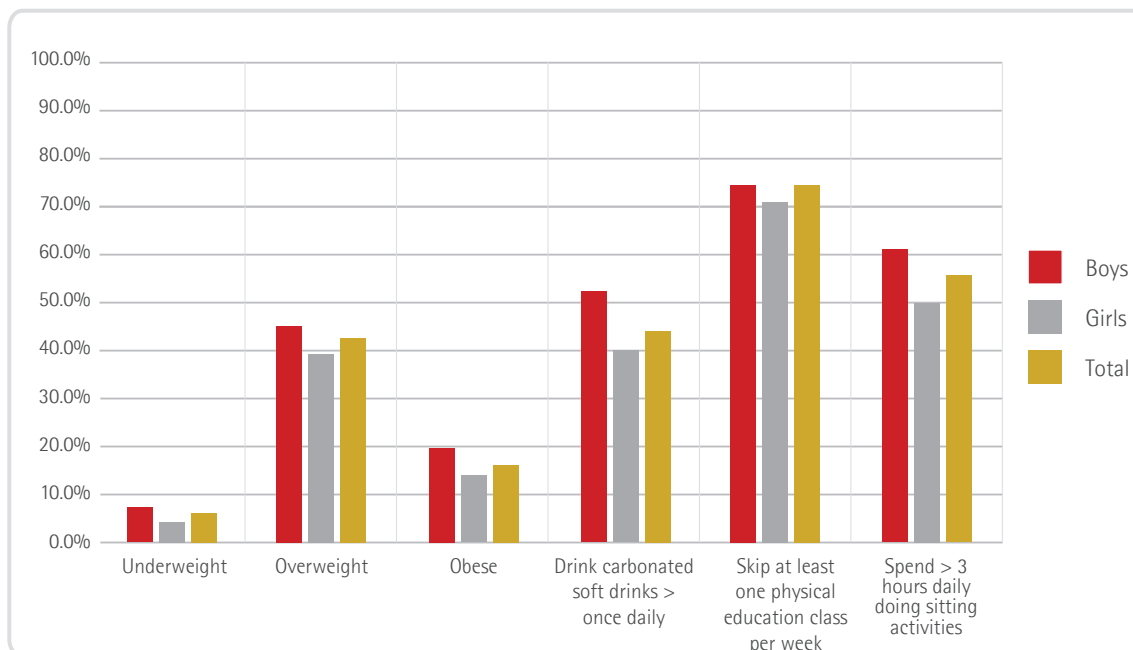
Source: WHO (2006), International Diabetes Foundation (2005)

Obesity and Diabetes

A study published by BioMed Central (BMC) Public Health ranked the UAE as the world's fifth most obese nation, reporting that the average adult in the UAE consumes over 3,000 calories per day, more than 20% over the recommended daily allowance

(Walpole, 2012). Between 1998 and 2003, nearly 80% of males and over 75% of females in the Emirates reported eating less than the recommended five daily servings of fruits and vegetables (Musaiger, 1998; WHO, 2003). Significantly, low-nutrition processed

Figure 7: Prevalence of Weight Issues and Related Lifestyle Habits in U.A.E. High School Children in 2010



Source: Global School-based Health Survey U.A.E., 2010

snacks account for 20% of the average caloric intake. In addition, beverages such as carbonated sodas and fruit-concentrate drinks account for up to 70% of daily liquid intake.

Physical activity levels are particularly low among female Emiratis and those living in urban areas (Ng, 2011). Past studies have alluded to possible societal and institutional reasons accounting for low physical activity levels among Emiratis of all ages (Carter, 2003; Wasif, 2004; Musaiger, 2003). Explanations include strong socio-cultural norms that create obstacles for physical activity and involvement in sports, a lack of active role models to exemplify healthy lifestyle habits, and—for females—limited access to segregated sporting venues and to appropriate athletic attire (Berger, 2009). Emiratis also forgo the traditional domestic activity related to chores, as these are often carried out by employed domestic housekeepers and cooks (Al Hourani, 2003).

Children tend to adopt the poor lifestyle habits of their family members. The frequency of obesity among youth in the UAE is reportedly two to three times higher than published international figures (Kelishadi, 2007). Statistics from a 2012 nationwide survey of Emirati and expatriate school children stated that over 15% of children were obese and nearly 40%

were overweight (Statistics Centre—Abu Dhabi, 2012). A statistical study of child obesity across the UAE revealed a relationship between obesity and age: obesity levels progressively increase in children from the ages of nine to 18. The prevalence of obesity in pre-adolescents is comparable to that in developed countries at approximately 5%. However, the number of obese children up to the age of 18 is three times greater in the UAE (Al Hadded, 2005). The 2010 U.A.E. Global School-Based Health Survey (GSHS) carried out a survey of students in grades 8, 9, and 10, which included measures of dietary behaviors and physical activity (Figure 7)

Another study suggests that childhood obesity may be linked to cultural restrictions on physical activity (particularly for females), lack of facilities that promote physical activity, and harsh weather conditions (Stott, 2012). According to the same study, 32.1% of parents “indicated income was a barrier to healthy eating patterns” (Stott, 2012, p.6). Interestingly, more than half of Emirati parents surveyed claimed that income was a barrier to health eating, while only 7.7% of expatriate parents shared this sentiment.

Obesity is linked to diabetes, and, in 2000, the WHO reported that 13.5% of the Emirati population was diabetic, the second-highest prevalence of the disease in the world (WHO EMRO, 2010). The figure

expected to rise to nearly 20% by the year 2030. The issue is not limited to nationals alone, as recent figures claim that 10% of the entire U.A.E. population is living with diabetes (Malik 2005, International Diabetes Federation 2013). Apart from unhealthy lifestyles, ignorance and negligence lead to under-diagnosis of the disease. Currently, around 35% of diabetes cases in the UAE remain undiagnosed, representing lost opportunities to avoid future costs and complications related to a largely preventable disease (Mugamer, 1995).

Interventions to curb obesity and diabetes have been in place for several years. Additionally, the MoH initiative implemented in government schools in Dubai and Ajman at the start of the 2009-2010 academic year provided a comprehensive program of regular physical activities, meal plans, and progress charts to participating students. By the end of the year, the pool of 144 student participants recorded an average of 40% reduction in weight (Qabbani, 2011). Following the success of this trial initiative, The School Health Education Project was launched in partnership with UNICEF at the start of the 2011-2012 academic year and expanded to include government schools in Ajman and Umm Al Quwain in the second phase (AMEinfo, 2013).

Respiratory Conditions

Respiratory diseases encompass conditions that affect the upper respiratory tract, trachea, bronchi, bronchioles, alveoli, pleura, pleural cavity, and the nerves and muscles that facilitate breathing. Common causes for respiratory illness include exposure to gases, dusts, and fumes, and even poor ambient air quality (Yeatts, 2012). The U.A.E. population in general is reported to be at a high risk of such exposures to smog and industrial emissions of particulate matter due to the increased urbanization, reliance on motorized transportation, traffic congestion, adverse weather conditions such as dust/sand storms, and the rapid expansion of the construction and manufacturing sectors that emit airborne pollutants (Loney, 2013). Pollutants often penetrate ventilation systems and contribute to existing indoor air pollution arising from smoking, cooking, and burning incense. A population-based study of indoor household air pollution in the Emirates revealed that participants in households with smokers were twice as likely to report doctor-diagnosed asthma and wheezing

symptoms, while those in which incense was used on a daily bases frequently complained of headaches, difficulty concentrating, and forgetfulness (Yeatts, 2012).

Nevertheless, tobacco consumption, rather than environmental factors, is the major contributor to increasing rates of respiratory ailments. Surveys conducted by the WHO report that nearly a quarter of 13 to 15-year-old males, 42% of 17-year-old males, and 20% of adult males are habitual smokers (WHO, 2005). Water-pipe (shisha) smoking is a popular past-time among both males and females in all age groups (Akl, 2011; WHO, 2005). During the average shisha smoking session, the smoker inhales chemicals equivalent to consuming 100 or more cigarettes, putting themselves and second-hand smokers at a high risk of developing chronic conditions such as lung cancer (WHO, 2005).

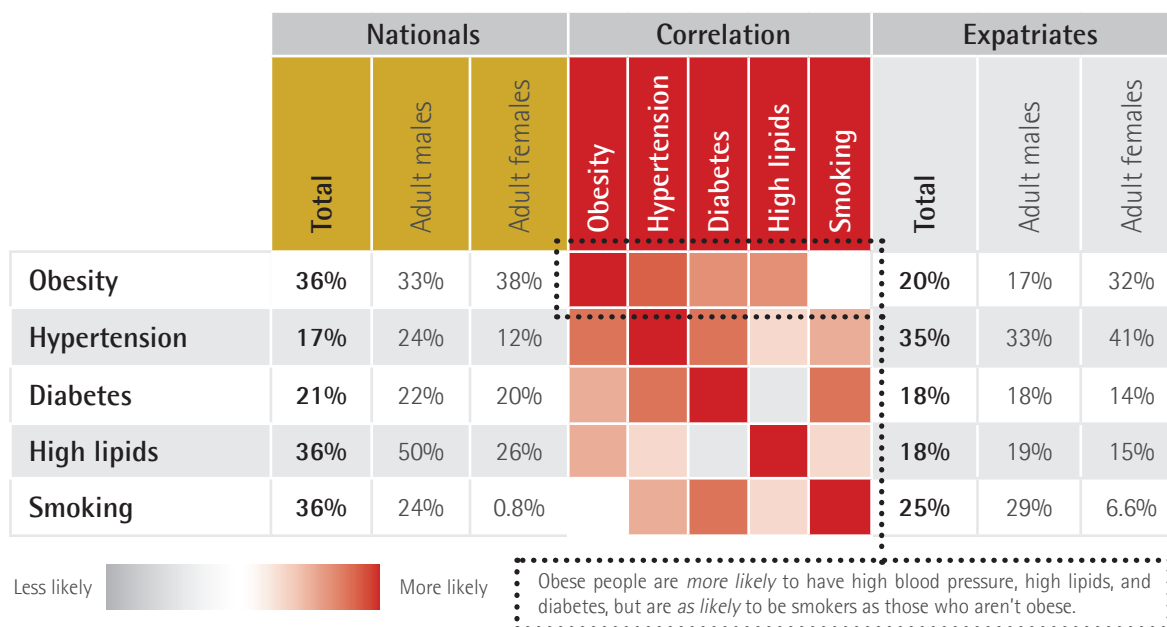
Aggressive interventions to curtail the smoking culture began with the Smoking Cessation Clinic (SCC), which was opened at the Sheikh Khalifa Medical City (SKMC) in late 2010. In 2009, federal law banned the promotion and public advertising of tobacco products. The law also “bans smoking in public transport and public places such as houses of worship, educational institutes, health and sports facilities and while driving with a child under 12 years old [sic]” (Abu Dhabi e-Government, 2009).

The government has also attempted to improve ambient air quality in recent years. The Abu Dhabi Emirate Environment Health & Safety Management System published a Code of Practice to minimize emissions of greenhouse gases and ozone-depleting substances in all targeted economic sectors, as well as to manage the quality of indoor air in industrial workplaces and commercial and public buildings (Health, Environment, and Safety Centre of Abu Dhabi, 2012).

Cardiovascular Diseases

Cardiovascular diseases are a class of diseases involving the heart, blood vessels, or parts of the cardiovascular system including the brain, kidney, and peripheral arteries (National Academies Press, 2010). More people die annually from CVDs than from any other cause, with 30% of all deaths worldwide attributed to cardiovascular conditions (WHO, 2008; WHO, 2011). The UAE has one of the highest age-

Figure 8: Select Cardiovascular Disease Indicators Among U.A.E. Population



Source: HAAD Health Statistics, 2012

standardized death rates caused by cardiovascular disease in the world (Loney, 2013). Despite this, recurrences of CVD can be diminished by up to 75% when an adequate combination of therapy is used (Yusuf, 2002).

Statistics show, despite the predominantly young population (median age is 18 for U.A.E. nationals and 31 for expatriates), cardiovascular diseases are the leading cause of mortality across the nation (Loney 2013; Hajat 2012). Mortality statistics reveal that 29% of all deaths in the emirate of Abu Dhabi in 2010, and over a quarter of all deaths in Dubai in 2012, were caused by cardiovascular conditions (Statistics Centre—Abu Dhabi, 2012; Dubai Health Authority, 2014). The DHA reports high proportions of cardiovascular disease risk factors, such as diabetes and hypertension, among U.A.E. nationals over the age of 15; other statistics reveal age-specific death rates due to diseases of the circulatory system that are five times higher among the local population than the expatriate population (Dubai Health Authority, 2014). Figure shows a breakdown of CVD prevalence among U.A.E. nationals and expatriates, as well as the degree of correlation to relevant risk factors.

To combat these trends, the Dubai Health Authority (DHA) commissioned cardiologists and specialists to conduct free tests for blood sugar, blood pressure, BMI, and full lipid profiles for World Health Day

2013. They then used the test results to provide free consultations and advice to participants. Similarly, the HAAD established a population-level “Weqaya” (Arabic for “prevention”) program for U.A.E. nationals living in Abu Dhabi and recruited approximately 95% of Emirati adults into routine screenings that could facilitate targeted interventions to control CVD risk factors (Hajat, 2012). While the body of research based on Abu Dhabi and Dubai is growing, however, limited information exists on the northern emirates.

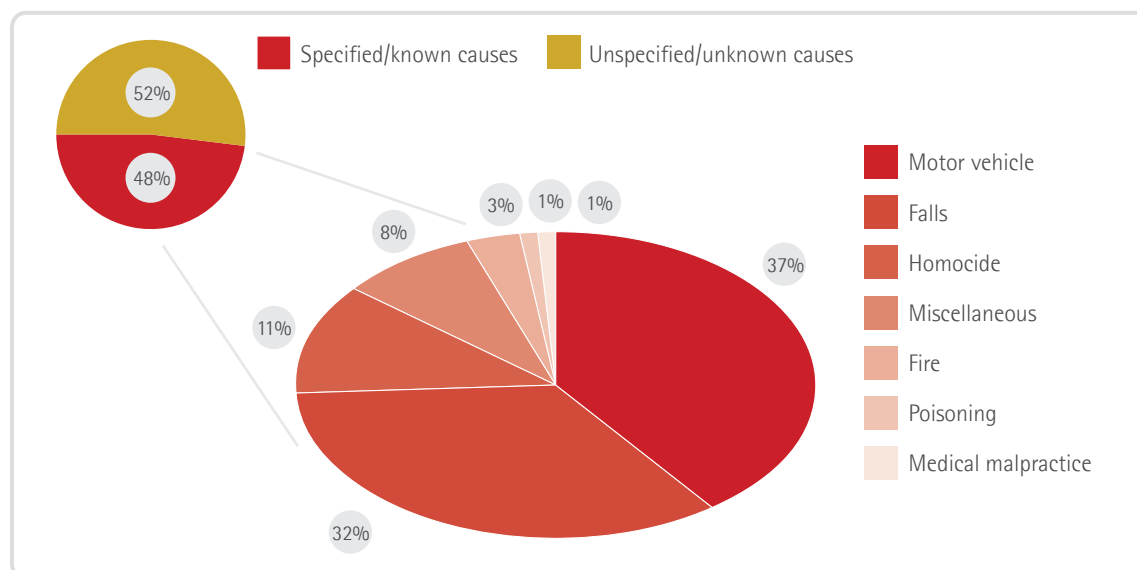
Non-Communicable Ailments

Injury

Injury is the leading cause of death for children under 15 and the second leading cause of mortality for all age groups, accounting for 17% of all deaths annually in the UAE (Grivna, 2012). Causes of injury-related deaths are outlined in Figure 9.

A notable 51% of injury-related accidental deaths were recorded without any specified cause in MoH data. Within the category of accidental deaths from known causes, road traffic-related injuries accounted for the largest number of accidental deaths in 2012. According to a study by Loney (2013), traffic-related

Figure 9: Causes of Injury-Related Deaths in the UAE in 2012



Source: U.A.E. Ministry of Health, 2012

Injuries have consistently been the predominant cause of injury-related death, causing nearly 70% of all accidental deaths between the years 2000-2008. The WHO estimates the traffic death rate in the UAE to be 37.1 fatalities per 100,000 inhabitants annually, which is several times higher than the equivalent rates in developed countries, such as Australia (7.8 per 100,000 population) and the United Kingdom (5.4 per 100,000 population) (WHO, 2009). Statistics suggest that a considerable degree of preventable mortality in the UAE is associated with negligence and the non-use of safety restraints (Ahmed 2010, Grivna 2012).

Deaths due to falling (9%) and drowning (3%) come next, and the former is primarily associated with occupational hazards (Loney, 2013; Grivna, 2012). Currently, there are limited efforts in place to prevent and address occupational injury and little has been published on the issue (Barss, 2009).

Cancer

An estimated 12.7 million new cancer cases were diagnosed worldwide in 2008, and cancer trends in the Emirates closely follow the global trends, making the disease a high priority for U.A.E. health care policy planners. Various forms of cancer caused 13.9% of all deaths in the Emirates in 2012, and cancer was the

third most common contributing factor to premature death among the population (Loney, 2013).

Breast cancer is the most common form of cancer among Emirati females. The most common cancer among Emirati males is lung cancer, affecting as many as 23% of men (but is rare in females at only 0.5% incidence), and colorectal cancer is the second most common cancer in both sexes (U.A.E. Ministry of Health, 2008; Gulf Centre for Cancer Control and Prevention, 2007). Although rates for all three types of cancer are still lower in the UAE than in most Western countries, and are also lower than in Qatar, Bahrain, and Kuwait, the rates are projected to double by the year 2020 as the U.A.E. population ages. Moreover, the current developmental stages of the public health care system in the Emirates, as well as the access barriers faced by desert-dwelling populations in the country, contribute to lower levels of screening and possibly an incomplete registration of cases.

Communicable Diseases

In view of the high immigration of expatriate workers to the UAE and the influx of tourists from all over the world, infectious diseases remain an important area

for public health in the UAE. However, communicable diseases are not included in the top four public health priority areas because rates of infectious and parasitic diseases in the UAE are low due to high standards of living, a strict immunization program, and regular health screenings of expatriate residents (Blair, 2012).

The MoH consistently strives to control potential outbreaks of new threats like avian flu or Severe Acute Respiratory Syndrome (SARS) as well as the “traditional” respiratory infections, such as tuberculosis, with the national immunization program and the visa-screening requirement for all expatriate workers in the UAE. Expatriate workers of certain nationalities are screened for communicable diseases, such as tuberculosis and Human Immunodeficiency Virus (HIV) before acquiring U.A.E. residence status (Loney, 2013). Additional screening for other communicable diseases is required for certain occupational categories, such as health care workers, cooks, house maids, and drivers (Loney, 2013).

Impact of Culture and Traditions on Public Health

Genetic Diseases

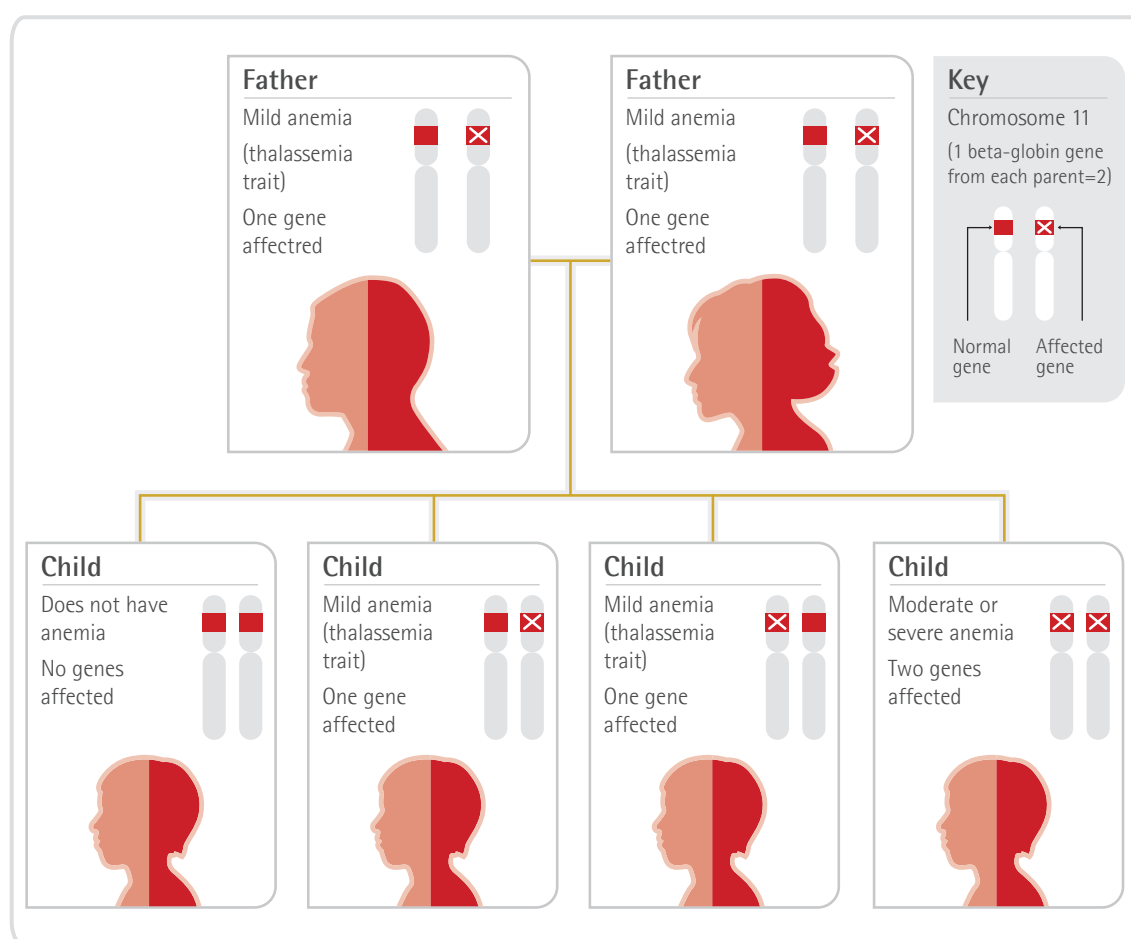
Despite improvements in recent years, congenital disease rates remain high in the UAE. An early review of the health status in the UAE in the 1990s revealed that congenital anomalies were the cause of 40.3% of all infant mortality and that the national population of the UAE exhibited the highest known rates in the world (Al Hosani, 1996). The high proportion of infant mortality caused by genetic disorders in the UAE is often attributed to three main factors: (1) A high proportion of pregnant women with advanced age (60% of children are born to mothers of 35-45 years); (2) a lack of pregnancy terminations due to fetal defects after abnormal findings on antenatal examinations; and (3) the traditionally high rate of consanguineous marriages (Denic, 2013). Genetic risks are higher due to the high level of endogamy—particularly between first cousins—that exists in the Arab world as a result of socio-cultural and religious traditions. Despite improvements in education and overall health of the population, the rate of consanguinity in the UAE increased from 39% to

50.5% in the 1990s (Al Ghazali, 1997).

One of the most common chromosomal anomalies, affecting on average one in every 800 live births, is Down syndrome, incidences of which are higher in the UAE (one in every 319) than in neighboring countries such as Oman (one in every 500) and Qatar (one in every 546) (Centre for Arab Genomic Studies, 2013). Although delayed pregnancies are often linked with the incidence of Down syndrome, U.A.E.-based statistics show that 75% of the mothers of Down syndrome patients were under 36 years of age, shifting the emphasis on genetic risks (Tadmouri, 2012). The relative risk for children with closely related parents is four times higher than for those with unrelated parents (Denic, 2013).

Hemoglobinopathies such as beta-thalassemia (beta-thal) make up the most common, inheritable, single-gene disorders affecting the Middle East. These disorders are often characterized by severe anemia, poor growth, and skeletal abnormalities, with affected children requiring life-long blood transfusions (Huisman, 1997). As illustrated in Figure 10, the child of two beta-thal minor (dormant gene carrying) parents has a 25% risk of being born with beta-thal major; a condition that if untreated, can cause severe bone deformities and lead to early death (Muncie, 2009). Furthermore, studies demonstrate that the burden of beta-thal is increased eight times by consanguinity (Denic, 2013) and data from the Centre for Arab Genomic Studies depict that the UAE exhibits one of the highest carrier frequencies of beta-thal in the Gulf region, with over 8% of U.A.E. population affected (Tadmouri, 2012). The U.A.E. Genetic Disease Association was established with the aim of preventing population-specific genetic disorders through promotion of health education, screening for genetic disorders, pre-marital screening, and provision of genetic counseling. The Association’s first project was a campaign focused on the eradication of thalassemia in the UAE by 2012, with efforts including a pre-marital screening program legislation enforced by the Dubai Health Authority. Thalassemia figures have halved since then, and the percentage of deaths caused by congenital malformations, deformations, and chromosomal abnormalities has dropped from 6.4% in 2005 to 2.9% in 2012 (Tadmouri, 2012).

Figure 10: Probabilities of Beta-Thalassemia Major Inheritance



Source: NIH, 2012

Women's Health

Maternal health care is well developed, and 98% of births take place in hospitals. The UAE has seen a remarkable decline in infant mortality rates (IMR) throughout the years, dropping from 14 infant deaths per 1,000 births in 1990 to seven infant deaths per 1,000 births in 2012 (Tadmouri, 2012). The UAE has also managed to reduce its maternal mortality ratios to levels considered low by international standards (no more than five maternal deaths per 100,000 live births) (UAE MoH, 2006). HAAD launched the "Enaya" program in 2013, dedicated to raising awareness of maternal health as well as newborn and infant care.

With the exceptions of pregnancy and breast cancer, however, women's health concerns are under-addressed in the UAE. Barriers to health care include community and cultural preferences that make women reluctant to seek health care outside the home (Kronfol 2012, Elbiss 2013). Studies also show

that most gynecological cancers and other women's health conditions are diagnosed in late stages in Arab countries due to a lack of reproductive health awareness combined with the cultural stigma of seeking medical advice for gynecological symptoms (Ibrahim, 2011). Female cervical cancer, triggered by infection of the human papilloma virus (HPV), can be prevented by vaccine; however, studies report a false perception among Arab and Islamic cultures that HPV can only affect men and women with multiple partners. In a country in which extra-marital relationships are prohibited, women tend to be ignorant of the fact that the risk of infection still exists and that vaccination is an important preventative measure for a potentially deadly disease (Ortashi, 2013).

A WHO study also documents the occurrence of female genital mutilation (FGM) in the UAE but does not provide data on its prevalence (WHO, 2008). The

practice is reportedly prevalent in rural and urban areas in the UAE (Kvello, 2003), with 34% of Emirati female respondents' saying they were circumcised (Al Marzouqi, 2011).

With cultural barriers affecting the demand side of health care for Emirati female patients, expatriate women seeking medical advice experience similar restrictions when they access the supply side of medicine in the UAE. U.A.E. Federal Law No. (10) of 2008 allows health care practitioners to breach doctor-patient confidentiality to report a crime (U.A.E. Supreme Council, 2008). Women are, therefore, required to present a marriage certificate when requesting maternity care, as extramarital relationships are criminal offences that may result in imprisonment and deportation. Government hospitals are particularly strict in enforcing these rules (Asger, 2011). In some cases, women have been criminally convicted and imprisoned after experiencing sexual assault. In addition, the cultural and legal stigma that is often linked with female reproductive health has also contributed to the rise of risky illegal abortions in the country (Asger, 2011).

Mental Health

According to statistics put forth by the DHA and the Community Development Authority in 2010, 20% of U.A.E. residents suffer from some form of mental or psychological disorder, including depression, anxiety, bipolar disorder, and schizophrenia.

In the UAE, though, many people opt to consult traditional healers and alternative medicine avenues before approaching mental health professionals (Eapen, 2004). For example, a study of attitudes towards mental health problems in children in the UAE found that only 37% desired to address their problems by seeking the help of a mental health specialist (Eapen, 2009). According to the same study, "Common barriers to seeking professional help include social stigma and the difficulty on the part of the family of accepting the fact that their child has a mental health problem, coupled with the negative perceptions of family and friends about mental health treatment" (Eapen, 2009, p. 44). Region-specific risk factors for psychiatric disorders in children include large number of children in the household and polygamous households (Eapen, 1998). In 1992, one of the earliest published studies on adolescent depression in the UAE identified 17.47% of school

students as depressed (Ghareeb, 1992). More recent studies have indicated a rise in rates, with 20% of 1,289 school students surveyed in Dubai showing signs of depression and 17.5% diagnosed with advanced symptoms (Sankar, 2013).

One of the most common mental disorders in both children and adults is depression, which can lead to anxiety, substance abuse, and a greater risk of suicide. Suicide is illegal in the UAE and is rarely studied in the region. One study on suicide in the UAE, however, revealed that the suicide rate among expatriates is seven times higher than the rate among nationals. The majority of suicide victims were male, older than 30 years, expatriate (almost 75% of Indian origin), single, employed, and had no more than a secondary-school education level (Dervic, 2012). According to a study on migrant domestic workers in the UAE, a major problem faced by expatriate domestic workers is the rampant incidence of deportation. Shah (2011, p. 271) explains, "Deportability affects the life of domestic workers and contributes to their perception as being 'disposable.'" This and other problems associated with expatriate life in the UAE (work's being tied to residency, feelings of isolation, lack of social support, etc.) are compounded by financial demands from family back home (Dervic, 2012; Manseau, 2006; Al Maskari, 2011).

Professional care is helpful in addressing mental health problems, but U.A.E. citizens and residents know little about how to pursue such care. Studies on mental health status in the Arab world found large proportions of respondents who were turning to traditional healers and prayer during times of psychological distress (Eapen, 2009; Al Kerwani, 2004).

Patients who do seek medical help for mental illness face the challenge of a supply gap in the mental health care sector, whose professionals lack sufficient quality control and training. In a recent study in Abu Dhabi, about 60% of general practitioners could not discriminate between depression and anorexia, and 85% did not recognize that cold cures interact significantly with antidepressants (Moselhy, 2009). The study also revealed that 94% of general practitioners' referrals to psychiatrists received no response (Saeed, 2006).

Although mental health is specifically mentioned in the U.A.E. general health policy, an officially approved mental health policy does not exist in the country. A Mental Health Act was proposed in 2013 but has yet to be passed (U.A.E. Ministry of Higher

Education and Scientific Research, 2013).

Areas of Demand

Overall, the UAE's health sector has developed significantly in the last decades, but areas of demand persist and fall into the following categories.

Research

A more pro-research model for health care and additional funding for public health initiatives could help balance dependence on the private providers found in the UAE's current health sector. Relevant research includes study at the medical and social levels. Extensive studies have been conducted into the country's most prominent chronic conditions, such as obesity and diabetes. However, a multitude of lesser-investigated problems exists and requires attention. These include, but are not limited to, the prevalence of respiratory illnesses and related risk factors, attitudes and behaviors that contribute to traffic injuries, cultural beliefs and traditions that hinder the improvement of overall health standards, and counter-productive attitudes toward mental health illnesses.

The institutions that currently generate the largest volume of health research in the UAE are the United Arab Emirates University, Al Ain and the Ras Al Khaimah Medical and Health Sciences University (RAKMHSU). RAKMHSU is set apart as the first comprehensive medical sciences training facility for both U.A.E. nationals and expatriate students, with full English language training encouraging enrollment from other countries in the region. The main barriers to research as expressed by officials at RAKMHSU are a lack of funding for equipment and quality

control, as well as a shortage of scholarships that could attract a larger number of promising students.

Infrastructure and Manpower

Primary care representatives in Ras Al Khaimah expressed a demand for added investment in improving infrastructure and access to health care, particularly in remote areas across the Emirates. One of the consistent burdens seen in both public and private providers is a shortage of qualified staff. Representatives of the MoH Primary Care Centers emphasized the need for nursing staff and on-call doctors to reduce the burden of long waiting lines and laboratory backlogs.

Shift in Attitudes

The single factor that would have the largest inter-generational impact on public health in the UAE would be a necessary shift in overall attitudes towards medicine and health care at the level of demand. For example, patients are accustomed to receiving medication for minor complaints, so they often feel inadequately treated if they do not receive a list of prescriptions at the end of each consultation. In turn, doctors respond to patients' demands for treatment by over-prescribing medicines. In addition, strong medications like antibiotics are often sold over-the-counter, which can result in their misuse and may compromise the patient's immune system. In sum, the greatest impact on health care in the UAE may depend on the paradigm of preventative medicine replacing that of curative medicine.

Bibliography

- Abu Dhabi e-Government. (2009). News. Retrieved from Abu Dhabi e-Government: https://www.abudhabi.ae/portal/public/en/abu_dhabi_emirate/government/news/news_detail?docName=ADEGP_DF_150248_EN8_adf.ctrl-state=jb3tyxyqu_4&afrLoop=9905947182163176
- Abu Dhabi Health Services Company (SEHA). (2008). Electronic patient care reporting system. Retrieved from SEHA: <http://www.seha.ae/en/tenders/pdf/G-RFP-24-2008/G-RFP-24-2008.pdf>
- Abu Dhabi Health Services Company (SEHA). (2014). SEHA facilities. Retrieved from <http://www.seha.ae/seha/en>
- Ahmed, H. O. (2010). Knowledge and practices related to occupational hazards among cement workers in the United Arab Emirates. *Journal of the Egyptian Public Health Association*, 85(3-4), 149-167.
- Akl, E. A. (2011). The prevalence of waterpipe tobacco smoking among the general and specific populations. *BMC Public Health*, 11(244), doi:10.1186/1471-2458-11-244
- Al Maskari, et al. (2011). Prevalence of depression and suicidal behaviors among male migrant workers in UAE. *Journal of Immigrant and Minority Health*, 13(6), 1027-1032. doi: 10.1007/s10903-011-9470-9
- Altenstetter, C. (2003). Insights from health care in Germany. *American Journal of Public Health*, 93(1), 38-44.
- Al Ghazali, L. (1997). Consanguineous marriages in the United Arab Emirates. *Journal of Biosocial Science*, 29(4), 491-497.
- Al Haddad, F. H. (2005). Childhood obesity in the United Arab Emirates: A national study. *Analysis of Human Biology*, 32(1), 72-79. doi:10.1080/03014460400027425
- Al Hosani, H. (1996). Unique demographic situation in the United Arab Emirates. *American Journal of Medical Genetics*, 61(1), 1-2. doi: 10.1002/ajmg.1320610102
- Al Hourani, H. M. (2003). Prevalence of overweight among adolescent females in the United Arab Emirates. *American Journal of Human Biology*, 15(6), 758-764. doi: 10.1002/ajhb.10212
- Al Kerwani, A. (2004). Cross-national study of attitudes towards seeking professional help: Jordan, UAE and Arabs in Israel. *International Journal of Social Psychiatry*, 50(2), 102-114.
- Al Marzouqi, W. (2011, July 23). Fatal traditions: Female circumcision in the UAE. The National.
- AMEinfo. (2013, February 10). Unicef reviews the UAE's successful anti-obesity programme for children. Retrieved from <http://ameinfo.com/blog/mining-&quarrying/united-nations/unicef/unicef-reviews-the-uaes-successful-anti-obesity-programme-for-children/>
- Asger, M. (2011, July 7). Illegal abortions: A fatal choice. Gulf News.
- Balasy, E. E. (1990). Prevalence on known diabetes mellitus among nationals in Abu Dhabi City. *Journal of Egyptian Public Health Association*, 65(633), 642.
- Barss, P. (2009). Occupational injury in the United Arab Emirates: Epidemiology and prevention. *Oxford Journal of Occupational Medicine*, 59(7), 493-498. doi: 10.1093/occmed/kqp101
- Bayouna, L. M. (2008). High prevalence of cardiovascular risk factors in Al Ain, United Arab Emirates: An emerging priority. *Saudi Medical Journal*, 29(8), 1173-1178.
- BBC. (2008, April 1). Health screening for the over-40s. Retrieved from <http://news.bbc.co.uk/2/hi/health/7323072.stm>
- Berger, G. (2009). Giving young Emirati women a voice: Participatory action research on physical activity. *Health Place*, 15(1), 117-124. doi: 10.1016/j.healthplace.2008.03.003
- Bernard, E. (1993). The politics of Canada's health care system: Lessons for the U.S. *Radical America*, 24(3). Retrieved from http://www.law.harvard.edu/programs/lwp/people/staffPapers/bernard/canada_healthcare_1992.pdf
- Blair, I. (2012). Population structure and the burden of disease in the United Arab Emirates. *Journal of Epidemiology and Global Health*, 2(2), 61-71. doi: 10.1016/j.jegh.2012.04.002
- Bloomberg. (2013, August 19). Most efficient health care: Countries. Retrieved from Bloomberg Visual Data: <http://www.bloomberg.com/visual-data/best-and-worst/most-efficient-health-care-countries>
- Bocognano, A. (2001). La complémentaire maladie en France: qui bénéficie de quels remboursements? Retrieved

from <http://www.irdes.fr/Publications/Qes/Qes32.pdf>

British Medical Association. (2007). Survey of the general public's views on NHS system reform in England. Retrieved from [http://bma.org.uk/ap.nsf/AttachmentsByTitle/PDFnhssystreform2007/\\$FILE/48751Surveynhsreform.pdf](http://bma.org.uk/ap.nsf/AttachmentsByTitle/PDFnhssystreform2007/$FILE/48751Surveynhsreform.pdf)

Brown, L. D. (2003). Comparing health systems in four countries. *American Journal of Public Health, 93*(1), 52-56. doi: 10.2105/AJPH.93.1.52

Bump, J. B. (2010). The long road to universal health coverage: A century of lessons for development strategy. Retrieved from <http://www.rockefellerfoundation.org/uploads/files/23e4426f-cc44-4d98-ae81-ffa71c38e073-jesse.pdf>

Busse, R. (1999). Priority-setting and rationing in German health care. *Health Policy, 50*(1-2), 71-90. doi: [http://dx.doi.org/10.1016/S0168-8510\(99\)00065-2](http://dx.doi.org/10.1016/S0168-8510(99)00065-2)

Cancer Research UK. (2012). Smoking statistics: Smoking and cancer. Retrieved from <http://www.cancerresearchuk.org/cancer-info/cancerstats/causes/tobacco-statistics/>

Carter, A. O. (2003). Health and lifestyle needs assessment of medical students in the United Arab Emirates. *Medical Teaching, 25*(5), 492-496. doi:10.1080/01421590310001605633

Centre for Arab Genomic Studies. (2013). Down syndrome in the Arab world. Retrieved from <http://www.cags.org.ae/Down%20Syndrome-English.pdf>

Chenier, N. M. (2002). Health policy in Canada. Retrieved from <http://publications.gc.ca/Collection-R/LoPBdP/CIR/934-e.htm>

Commonwealth Fund. (2012). International profiles of health care systems pub. no. 1645. Retrieved from http://www.commonwealthfund.org/~media/Files/Publications/Fund%20Report/2012/Nov/1645_Squires_intl_profiles_hlt_care_systems_2012.pdf

Davidson, S. M. (2010). Still broken: Understanding the US health care system (1st Ed.). Stanford, California: Stanford University Press.

Denic, S. (2013). Beta-thalassemia in Abu Dhabi: Consanguinity and tribal stratification are major forces explaining the high prevalence of the disease. *Haemoglobin, 37*(4), 351-358. doi: 10.3109/03630269.2013.790827

Dervic, K. (2012). Suicide rates in national and expatriate population in Dubai, UAE. *International Journal of Social Psychiatry, 58*(6), 652-656. doi: 10.1177/0020764011430038

Direction de l'Hospitalisation et de l'Organisation des Soins (DHOS). (2000). L'hospitalisation en France, Données et chiffres repères (Review article). Retrieved from <http://documentationcentrale.docchu-lyon.fr/cgi-bin/koha/opac-detail.pl?biblionumber=129298>

Dubai Health Authority (DHA). (2009). Dubai household health survey 2009: Preliminary summary of results related to smoking. Retrieved from <http://www.dsc.gov.ae/Publication/DHA%20DHHS%20Smoking%202009.pdf>

Dubai Health Authority (DHA). (2014, January 20). About us—Vision. Retrieved from www.dha.gov.ae

Dubai Health Authority (DAH). (2014). DHA: Our history. Retrieved from <http://www.dha.gov.ae/En/aboutus/pages/ourhistory.aspx>

Dubai Health Authority (DHA). (2014, January 20). Facilities. Retrieved from www.dha.gov.ae

Eapen, V. (2004). Child psychiatric disorders in a primary care Arab population. *International Journal of Psychiatry in Medicine, 34*(1), 51-60.

Eapen, V. (2009). Integration of child mental health services to primary care: Challenges and opportunities. *Mental Health in Family Medicine, 6*(1), 43-48.

Eapen, V. (1998). Mental health problems among schoolchildren in the United Arab Emirates: Prevalence and risk factors. *Journal of American Academic Child and Adolescent Psychiatry, 37*(8), 880-886.

Elbiss, H. M. (2013). Social impact and healthcare-seeking behaviour among women with urinary incompetence in the UAE. *International Journal of Gynaecology and Obstetrics, 122*(2), 136-139. doi: 10.1016/j.ijgo.2013.03.023

- Gautam, S. (1998). Clinical presentation of breast cancer in the UAE. *Emirates Medical Journal*, 6, 23-28.
- Ghareeb, G. A. (1992). The nature of adolescent depression in the UAE. *Egyptian Journal of Mental Health*, 33, 45-67.
- Government of Dubai. (2009). Retrieved from Dubai Municipality: <https://login.dm.gov.ae/wps/wcm/connect/4f00a9f6-e495-4923-b53e-35397f5a9962/MANUAL+OF+REGULATING+SMOKING+IN+PUBLIC+PLACES.pdf?MOD=AJPERES>
- Grivna, M. (2013). Child and youth traffic-related injuries: Use of a trauma registry to identify priorities for prevention in the UAE. *Traffic Injury Prevention*, 14(3), 274-282. doi: 10.1080/15389588.2012.711498
- Grivna, M. (2012). The legal framework and initiatives for promoting safety in the United Arab Emirates. *International Journal of Control and Safety Promotion*, 19(3), 278-89. doi: 10.1080/17457300.2012.696660
- Gulf Centre for Cancer Control and Prevention (GCCCP). (2007). Ten-year cancer incidence among nationals of the GCC states. Retrieved from <http://www.moh.gov.bh/pdf/publications/GCC%20Cancer%20Incidence%202011.pdf>
- Hajat. (2012). A profile and approach to chronic disease in Abu Dhabi. *Globalization and Health*, 8(18), doi:10.1186/1744-8603-8-18
- Health Authority Abu Dhabi (HAAD). (2013, October 7). HAAD news. Retrieved from HAAD.ae: <http://www.haad.ae/haad/tabid/58/ct/Details/Mid/417/ItemID/374/Default.aspx>
- Health Authority Abu Dhabi (HAAD). (2010). Medical liability report.
- Health, Environment and Safety Centre of Abu Dhabi. (2012). FEHS Management System.
- Huisman, T. J. (1997). A syllabus of thalassemia mutations. GA, USA.
- Ibrahim, A. (2011). Predictors of cervical cancer being at an advanced stage at diagnosis in Sudan. *International Journal of Women's Health*, 3, 385-389.
- International Diabetes Federation. (2013). IDF: United Arab Emirates. Retrieved from <http://www.idf.org/membership/mena/united-arab-emirates>
- International Monetary Fund. (2012). World economic outlook. Retrieved from <http://www.imf.org/external/pubs/ft/weo/2012/01/>
- Institute of Medicine (IOM). (2010). Promoting cardiovascular health in the developing world: A critical challenge to achieve global health. (V. F. Kelly, Ed.) Washington, D.C.: National Academies Press.
- Kelishadi, R. (2007). Childhood overweight, obesity, and the metabolic syndrome in developing countries. *Epidemiologic Reviews*, 29, 62-76.
- Kronfol, N. M. (2012). Access and barriers to health care delivery in Arab countries: A review. *Eastern Mediterranean Health Journal*, 18(12), 1239-1246.
- Kvello, A. (2003). Omskjering av kvinner i de forente arabiske emirater—er klitoridektomi i tradisjonell praksis et overgrep mot kvinner? (Concerning female circumcision in the UAE: Is clitoridectomy in a traditional context an assault against women?) (Doctoral dissertation). Retrieved from Faculty of Medicine, University of Oslo.
- Latham & Watkins. (2013, May). 2013 update: Healthcare regulation in the United Arab Emirates. Latham & Watkins Client Alert White Paper.
- Light, D. W. (2003). Universal health care: Lessons from the British experience. *American Journal of Public Health*, 93(1), 25-30.
- Loney, T. (2013). An analysis of the health status of the United Arab Emirates: The "Big 4" public health issues. *Global Health Action*, 6, doi: <http://dx.doi.org/10.3402/gha.v6i0.20100>
- Malik, M. (2005). Glucose intolerance and associated factors in the multi-ethnic population of the United Arab Emirates: Results of a national survey. *Diabetes Research and Clinical Practices*, 69(2), 188-195.
- Manseau, G. S. (2006). Contractual solutions for migrant labourers: The case of domestic workers in the Middle East. *University of Nottingham Human Rights Law Commentary*, 2. Retrieved from <http://www.nottingham.ac.uk/hrlc/documents/publications/hrlcommentary2006/migrantlabourers.pdf>
- Maraqqa, M. A. (2013). Key drivers for successful safety management system of construction activities in Abu Dhabi Emirate. *International Journal of Advanced Fire, Explosive, Environment Safety and Disaster Management*, 1(1), 1-17.

- Marmore, T. R. (2009, August). Health care abroad: Canada. (S. Arnquist, Interviewer).
- Mathers, C. D. (2006). Projections of global mortality and burden of disease from 2002 to 2030. *Public Library of Science Medicine*, 3(11) doi: 10.1371/journal.pmed.0030442
- Ministry of Health, S. (2012). Schemes and subsidies. Retrieved from http://www.moh.gov.sg/content/moh_web/home/costs_and_financing/schemes_subsidies.html
- Moselhy, H. F. (2009). Referrals to psychiatric service in United Arab Emirates: An analysis of the content of referral letters. *International Journal of Health Sciences*, 3(1), 13-18.
- Mugamer, I. T. (1995). Diabetes, obesity and hypertension in urban and rural people of bedouin origin in the United Arab Emirates. *Journal of Tropical Medicine and Hygiene*, 96(6), 407-415.
- Muncie, H. L. (2009). Alpha and beta thalassemia. *American Family Physician*, 80(4).
- Musaiger, A. O. (1998). Food consumption patterns of adults in the UAE. *Journal of the Royal Society of Health*, 118(3), 146-150.
- Musaiger, A. O. (2003). Lifestyle factors associated with obesity among male university students in the United Arab Emirates. *Nutritional Food Science*, 33(4), 145-147. doi: 10.1108/00346650310488480
- National Academies Institute of Medicine. (2012, September 6). Best care at lower cost: The path to continuously learning health care in America. Retrieved from <http://www.iom.edu/Reports/2012/Best-Care-at-Lower-Cost-The-Path-to-Continuously-Learning-Health-Care-in-America.aspx>
- National Audit Office. (2012). International health comparisons. Retrieved from http://www.nao.org.uk/wp-content/uploads/2003/02/Int_Health_Comp.pdf
- National Staff. (2013, August 13). UAE ministry health card allow expats to get treated at half price. The National.
- Ng, S. W. (2011). Nutrition transition in the United Arab Emirates. *European Journal of Clinical Nutrition* 65(12), 1328-1337. doi: 10.1038/ejcn.2011.135
- Organization for Economic Co-operation and Development (OECD). (2001). OECD health data 2001: A comparative analysis of 30 countries (ISBN 92-64-06876-7). Paris: OECD and CREDES.
- Organization for Economic Co-operation and Development (OECD). (2005). OECD health data 2005: How does the United States compare. Retrieved from <http://www.oecd.org/unitedstates/34970246.pdf>
- Ortashi, O. (2013). Gynaecological cancer services in Arab countries: Present scenario, problems and suggested solutions. *Asian Pacific Journal of Cancer Prevention*, 14(3), 2147-2150.
- Owais, A. R. (2014, July 2). Minister speech. Retrieved from Ministry of Health UAE: www.moh.gov.ae
- Population of the UAE. (2014). Retrieved from dubaifaqs: <http://www.dubaifaqs.com/population-of-uae.php>
- Qabbani, B. (2011, April 1). Anti-obesity campaign reports success. The National.
- Rosenthal, E. (2013, December 21). News analysis—Health care’s road to ruin. New York Times.
- Saeed, M. (2006). General practitioners knowledge and attitude towards anxiety and depression in Abu Dhabi. *Middle East Journal of Family Medicine*, 3(5), doi:10.1186/1752-4458-3-5
- Salem, O. (2013, March 20). UAE will improve health care in northern Emirates, minister assures FNC. The National.
- Sambridge, A. (2009, October 7). UAE population hits 6m, Emiratis make up 16.5%. Arabian Business.com.
- Sandier, S. (2002). Health care systems in eight countries: Trends and challenges. London School of Economics and Political Sciences.
- Sankar, A. (2013, June 19). Rise in cases of depression among school children worries authorities. Gulf News.
- Shah, M. (2011). Personal, occupational and public health perspectives on dealing with the first case of H1N1 in the UAE. *Safety and Health at Work*, 2(1), 83-86. doi: 10.5491/SHAW.2011.2.1.83
- Shah, N. M. (2011). “But we can always get more”: Deportability, the state, and gendered migration in the United Arab Emirates. *Asian and Pacific Migration Journal*, 20(3-4), 413.
- Sorensen, R. F. (2013). Lifestyle medicine: The future of chronic disease management. *Current Opinion in Endocrinology, Diabetes, and Obesity*, 20(5), 389-395. doi: 10.1097/01.med.0000433056.76699.5d

- Statistics Centre—Abu Dhabi. (2012). UAE Mortality and Sickness Statistics.
- Stott, K. (2012, January). Teachers', parents' and children's perceptions of childhood obesity in Ras Al Khaimah (Policy Paper No. 1). Retrieved from [http://www.alqasimifoundation.com/Files/Pub2-paper\(Kelly.Stott\).pdf](http://www.alqasimifoundation.com/Files/Pub2-paper(Kelly.Stott).pdf)
- Stuckler, D. (2010). The political economy of universal health coverage. Retrieved from <http://www.pacifichealthsummit.org/downloads/UHC/the%20political%20economy%20of%20uhc.PDF>
- Tadmouri, et al. (2012). Genetic disorders in the United Arab Emirates. Retrieved from Center for Arab Genomic Studies: <http://www.cags.org.ae/cbc04gu.pdf>
- Tadmouri, G. O. (2010). Cancers in the United Arab Emirates. *Generic Disorders in the Arab World*.
- U.A.E. Interact. (2013). UAE: Political system. Retrieved from http://www.uaeinteract.com/government/political_system.asp#E
- U.A.E. Ministry of Health. (2011). About the ministry: Strategy. Retrieved from <http://www.moh.gov.ae/en/About/Pages/Strategy.aspx>
- U.A.E. Ministry of Health. (2012). Allotment and actuals for budget by section. Retrieved from <http://www.moh.gov.ae/en/OpenData/Pages/OpenData.aspx?Category=All%20Open%20Data>
- U.A.E. Ministry of Health. (2008). Incidence and mortality rates for the UAE. Retrieved from <http://www.moh.gov.ae/en/OpenData/Pages/OpenData.aspx?Category=Statistics>
- U.A.E. Ministry of Health. (2012). UAE incidence and mortality rates. Retrieved from <http://www.moh.gov.ae/en/OpenData/Pages/OpenData.aspx?Category=All%20Open%20Data>
- U.A.E. Ministry of Higher Education and Scientific Research. (2013). Mental health law issued by the UAE soon. Retrieved from <http://www.mohesr.gov.ae/En/MediaCenter/News/Pages/Mental-Health-Law-issued-by-the-UAE-soon.aspx>
- U.A.E. National Bureau of Statistics. (2012). UAE in figures 2012. Retrieved from <http://www.uaestatistics.gov.ae/EnglishHome/tabid/96/Default.aspx>
- U.A.E. National Societies of Public Welfare. (n.d.). Federal Law No. 1 of 1972.
- U.A.E. Supreme Council. (2008). Federal law No. (10): Concerning medical liability. Retrieved from <http://www.dha.gov.ae/EN/SectorsDirectorates/Directorates/HealthRegulation/LegislationNPolicies/Documents/Medical%20Liability%20Federal%20Law%20No.10-2008.pdf>
- United Nations Children's Fund (UNICEF). (2012). Partnership profile—The fat truth: A partnership to raise awareness about child obesity in the United Arab Emirates. UNICEF.
- United Nations Development Programme (UNDP). (2002). Arab human development report: Creating opportunities for future generations. United Nations Publications.
- United States Department of State (DoS). (2007). World country profiles—United Arab Emirates. U.S. Department of State.
- Walpole, S. C. (2012). The weight of nations: an estimation of adult human biomass. *BioMed Central Public Health Journal*, 12(439), doi:10.1186/1471-2458-12-439
- Wasif, A. S. (2004). Sport practice among private secondary-school students in Dubai in 2004. *Eastern Mediterranean Health Journal*, 14(3), 704-714.
- Willett, W. C. (2006). Prevention of chronic disease by means of diet and lifestyle changes. In D.T. Jamison, et al. (Eds.), *Disease Control Priorities in Developing Countries* (2nd edition). Washington, D.C.: World Bank.
- World Bank. (2012). Health expenditure, public (% of total health expenditure). Retrieved from <http://data.worldbank.org/indicator/SH.XPD.PUBL> World Factbook. (2014). Country comparison: Net migration rate. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2112rank.html?countryName=India&countryCode=in®ionCode=sas&rank=85#in>
- World Health Organization (WHO). (2003). World health survey: United Arab Emirates. Retrieved from <http://apps.who.int/healthinfo/systems/surveydata/index.php/catalog/128>
- World Health Organization (WHO). (2006). Country Cooperation Strategy for the WHO and the United Arab Emirates. Retrieved from http://www.who.int/countryfocus/cooperation_strategy/ccs_are_en.pdf

World Health Organization (WHO). (2008). Eliminating Female Genital Mutilation (FGM): An inter-agency statement (ISBN: 978 92 4 159644 2). WHO Press.

World Health Organization (WHO). (2011). Global status report on non-communicable diseases (ISBN 978 92 4 068645 8). Retrieved from http://www.who.int/nmh/publications/ncd_report_full_en.pdf

World Health Organization (WHO). (2009). Global status report on road safety: Time for action (ISBN 978 92 4 156384 0). Retrieved from http://whqlibdoc.who.int/publications/2009/9789241563840_eng.pdf

World Health Organization (WHO). (2010). National strategy and action plan for environmental health: United Arab Emirates. Retrieved from <https://sph.unc.edu/files/2013/07/report.pdf>

World Health Organization (WHO). (2008). The global burden of diseases: A WHO global report. Retrieved from http://www.who.int/healthinfo/global_burden_disease/GBD_report_2004update_full.pdf

World Health Organization (WHO). (2005). Water-pipe tobacco smoking: Health effects, research needs and recommended actions by regulators. WHO Tobacco-Free Initiative.

World Health Organization (WHO). (2011). World health statistics. Retrieved from http://www.who.int/gho/publications/world_health_statistics/EN_WHS2011_Full.pdf

World Health Organization (WHO). (2013). World Health Statistics. Retrieved from http://www.who.int/gho/publications/world_health_statistics/2013/en/

World Health Organization (WHO). (2013). Research for universal health coverage: World health report 2013 (ISSN 1020-3311).

World Health Organisation's Regional Office for the Eastern Mediterranean (EMRO). (2010). Health systems profile—UAE. Retrieved from <http://gis.emro.who.int/HealthSystemObservatory/PDF/United%20Arab%20Emirates/Full%20Profile.pdf>

Yeatts, K. B. (2012). Indoor air pollutants and health in the United Arab Emirates. *Environmental Health Perspectives*, 120(5), 687-694. doi: 10.1289/ehp.1104090

Yusuf, S. (2002). Two decades of progress in preventing vascular disease. *Lancet*, 360(9326), 2-3.

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