

*Invited paper*

# Noncommunicable diseases: risk factors and regional strategies for prevention and care

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**SUMMARY** Noncommunicable diseases (NCDs) are a major disease burden in the Region. Many of the risk factors are related to lifestyle and can be controlled. Physical inactivity, low fruit and vegetable intake, high fast food consumption and high cholesterol are predominant causes of cardiovascular disease and some cancers. Overweight and obesity can lead to metabolic changes and raise the risk of NCDs, including heart disease and type 2 diabetes. Three main strategies are proposed to deal with the problem: estimate need and advocate for action; develop national policies, strategies and plans for prevention and care; promote and implement community participation in prevention and care. NCDs are preventable using available knowledge; solutions are effective and highly cost-effective.

## Introduction

The incidence of noncommunicable diseases (NCDs) such as cardiovascular disease, diabetes, cancer and renal, genetic and respiratory diseases is rising significantly in the Eastern Mediterranean Region. Currently, 47% of the Region's burden of disease is due to NCDs and it is expected that this will rise to 60% by the year 2020. The modifiable risk factors—smoking, unhealthy diet and physical inactivity, expressed as diabetes, obesity and high lipids—are the root causes of the global epidemic in NCD. Although the relative importance of these may vary in different populations, these conventional risk factors may explain 75% of chronic conditions [1].

## Prevalence and burden of NCD risk factors

The World Health Organization (WHO) Eastern Mediterranean Region is exposed

to NCD risk factors as part of risk-transition as a result of marked changes in the pattern of living in many countries of the Region, particularly countries of the Gulf Cooperation Council, where rapid increases in obesity are being recorded, primarily among children, adolescents and young adults. Overweight and obesity have risen 2-fold or more since 1980. Changes in food processing, production and type of food (fast food) have affected health in the majority of countries in the Region.

A review of available data from the Eastern Mediterranean Region shows that both men and women are at high risk [2]. Table 1 shows the frequency of distribution of NCD risk factors among adults aged 20 years and above in Member States. Figure 1 shows the overall prevalence of NCD risk factors among the adult population  $\geq 20$  years in the Region [2]. When considering the prevalence of multiple risk factors, however, it was found that, of an adult population of 300 million, 60% had at least

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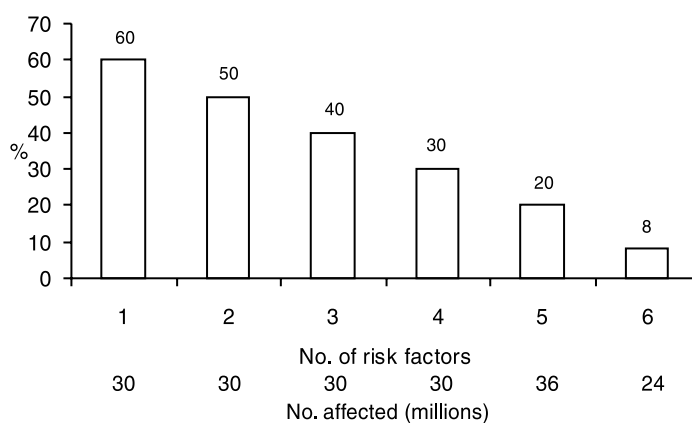
**Table 1 Distribution of noncommunicable disease risk factors in the countries of the Eastern Mediterranean Region [2]**

Risk factor	Regional adjusted mean (%)	Range (%)
Smoking		
Males	40	9–82
Females	13	–
Hypertension	26	7–48
Diabetes	14.5	3–36
Overweight/obesity	43	11–79
Dyslipidaemia	50	4–57
Physical inactivity	79	18–97

1 risk factor and 8% had 6 risk factors. A sizeable proportion of the population is at risk since 30 million people have 4 risk factors, 36 million have 5 risk factors and 24 million have 6 risk factors. Figure 2 illustrates the burden of these risk factors as

measured as a percentage of the disability adjusted life years (DALYs) among the countries of the Region that have low mortality rates (Bahrain, Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia and United Arab Emirates) compared with those with high mortality rates (Afghanistan, Djibouti, Egypt, Iraq, Morocco, Pakistan, Somalia, Sudan and Yemen). A comparison between risk factors in the Gulf Cooperation Council countries and in industrialized countries is shown in Table 2.

Many of the risk factors for heart disease, diabetes, cancer and pulmonary diseases are related to lifestyle and can be prevented. Physical inactivity, low fruit and vegetable intake, fast food consumption, high cholesterol, smoking and suboptimal control of blood pressure are the predominant causes for the endemic prevalence of coronary heart disease and ischaemic stroke.



**Figure 1 Overall prevalence of risk factors for noncommunicable diseases among adult population ≥ 20 years in countries of the Eastern Mediterranean Region**

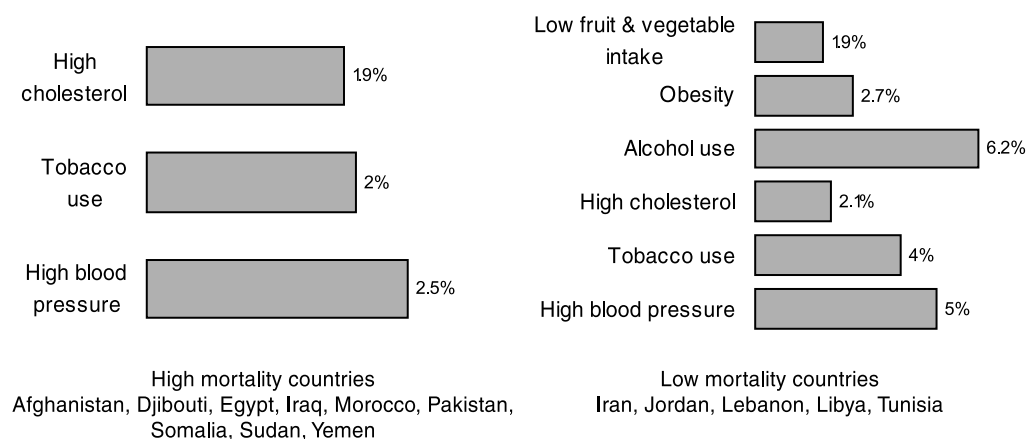


Figure 2 Burden of risk factors (%DALYs) among high and low mortality countries of the Eastern Mediterranean Region

### Overweight and obesity

Overweight and obesity can lead to adverse metabolic changes, including increases in blood pressure, unfavourable cholesterol levels and increased insulin resistance. They raise the risk of coronary heart dis-

ease, stroke, type 2 diabetes, atherosclerosis, gall bladder disease, hypertension, kidney failure and many forms of cancer, particularly breast cancer.

World Health Organization criteria for overweight and obesity are overweight =

Table 2 Leading risk factors among industrialized countries and Gulf Cooperation Council countries as percentage contribution to burden of all diseases [1,3]

Risk factor	Contribution to burden of disease (%)	
	Industrialized countries	Gulf Cooperation Council countries
Physical inactivity	3.3	3.0
Low fruit & vegetable intake	3.9	2.5
Obesity	7.4	5.4
Alcohol use	9.2	—
High cholesterol	7.6	5.0
Tobacco use	12.2	8.0
High blood pressure	10.9	7.5

body mass index (BMI) 25–29 kg/m<sup>2</sup> (body weight/height<sup>2</sup>) and obesity = BMI ≥ 30 kg/m<sup>2</sup> [4–6]. Globally, the Organization estimates that 58% of diabetes mellitus, 21% ischaemic heart diseases, 4%–42% of certain cancers are attributable to BMI above 21 kg/m<sup>2</sup> [7].

The prevalence of overweight and obesity for males and females in a number of countries of the Region is shown in Table 3. Among males, prevalence ranges from 10.5% in Pakistan to 64.0% in Saudi Arabia, while for females it ranges from 21.7% in Morocco to 79.0% in Bahrain [8–12]. The regional adjusted mean for overweight and obesity is 54.2% for women compared to 31.4% among males. Obesity kills around 150 000 men and women a year in the Region.

**Table 3 Prevalence of overweight and obesity among some countries of the Eastern Mediterranean Region [8–12]**

Country	Overweight/ obesity (%)	
	Males	Females
Bahrain	56.4	79.0
Egypt	43.8	41.0
Islamic Republic of Iran	57.0	67.7
Jordan	46.0	43.7
Lebanon	60.0	53.0
Libyan Arab Jamahiriya	42.5	74.9
Morocco	37.2	21.7
Oman	40.5	43.5
Pakistan	10.5	34.6
Saudi Arabia	64.0	70.0
Tunisia	13.1	41.9
United Arab Emirates	25.5	39.9

### Unhealthy diet: low fruit and vegetable intake

The contribution of suboptimal systolic blood pressure, high cholesterol, low fruit and vegetable intake and physical inactivity to the development of coronary heart disease and ischaemic stroke is shown in Figure 3. Globally, low fruit and vegetable intake is estimated to contribute to the development of approximately 31% of coronary heart disease and 11% of ischaemic stroke [1].

Low intake of fruits and vegetables among many countries of the Region has increased the prevalence of cardiovascular diseases and some cancers. At the same time, changes in lifestyle and rapid urbanization have led to less physical activity and this has contributed heavily to the increased regional prevalence of obesity and diabetes mellitus.

The prevalence of low intake of fruits and vegetables for 4 countries for which data are available (Bahrain, Pakistan, Saudi Arabia and United Arab Emirates) [8, 13] is shown in Figure 4.

The total caloric intake among a number of Member States is shown in Figure 5 [2]. The mean daily intake in 2000 was 3000 kcal/capita, except in Yemen where it was 2000 kcal/capita, and it seems there was no improvement between 1994 and 2000.

The proportion of the population that has NCD but is undiagnosed varies from country to country. Throughout the Region, 30% of the population are healthy, 50% are healthy with ≥ 1 NCD risk factors, 15% have NCD (including diabetes, cardiovascular disease, cancer, asthma and chronic obstructive pulmonary disease) and 5% have acute illness [14].

In a study in Oman, the majority of the participants (96%) were undiagnosed for

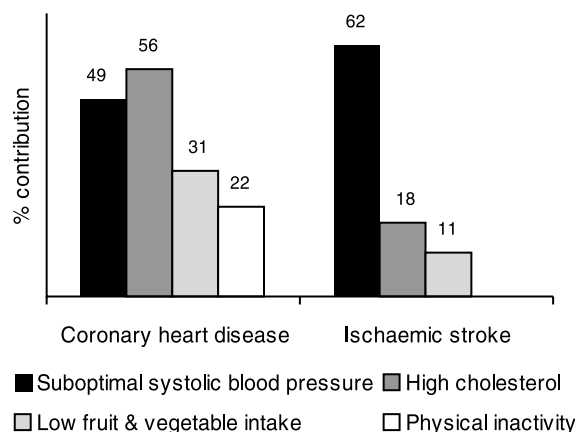


Figure 3 Contribution of selected risk factors to coronary heart disease and ischaemic stroke worldwide

NCD risk factors: 96% for hypercholesterolaemia, but lower for hypertension (69%) and diabetes (60%) [15].

### Cardiovascular disease

Cardiovascular disease and stroke are rapidly growing problems, and are the major causes of illness and deaths in the Eastern Mediterranean Region, accounting for 31% of deaths. Approximately 75% of cardiovascular disease can be attributed to conventional risk factors [16]. Hypertension affects almost 26% of the adult population in the Region. These conditions have major adverse health, social and economic effects within and beyond the health sector. This is because of the ageing population, high rates of smoking and changing nutritional and behavioural habits, along with a sedentary lifestyle. With the changing lifestyles, there is likely to be greater exposure to risk factors such as high blood pressure, physical inactivity and diets high in saturated fat, leading to elevated serum cholesterol levels.

Regional and national data have shown that cardiovascular disease imposes the highest morbidity burden for NCDs. The total DALYs lost in the Region in 2001 was approximately 136 million, of which approx 53 million (39%) were a result of NCD (Table 4) [1]. Total DALYs lost among the countries of the Region that have low child/low adult mortality (Bahrain, Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia and United Arab Emirates) is approximately 23 million, of which just over 13 million (57%) were a result of NCD (Table 4). On the other hand, total DALYs lost for the countries which have high child/high adult mortality (Afghanistan, Djibouti, Egypt, Iraq, Morocco, Pakistan, Somalia, Sudan and Yemen) is approximately 113 million, of which NCD contributes 39 million (35%) (Table 4).

Interestingly, the burden of DALYs lost due to cardiovascular disease in the coun-

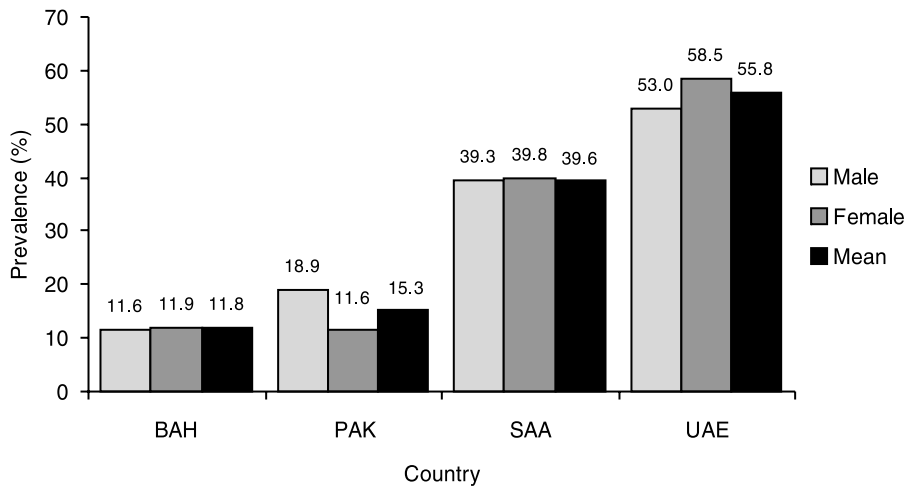


Figure 4 Prevalence of low fruit and vegetable intake in Bahrain (BAH), Pakistan (PAK), Saudi Arabia (SAA) and the United Arab Emirates (UAE) [8, 13]

tries of the Region which have low child/low adult mortality is 3 million (23% of NCD burden) and is approximately 8.8 million (23% of NCD burden) among the high

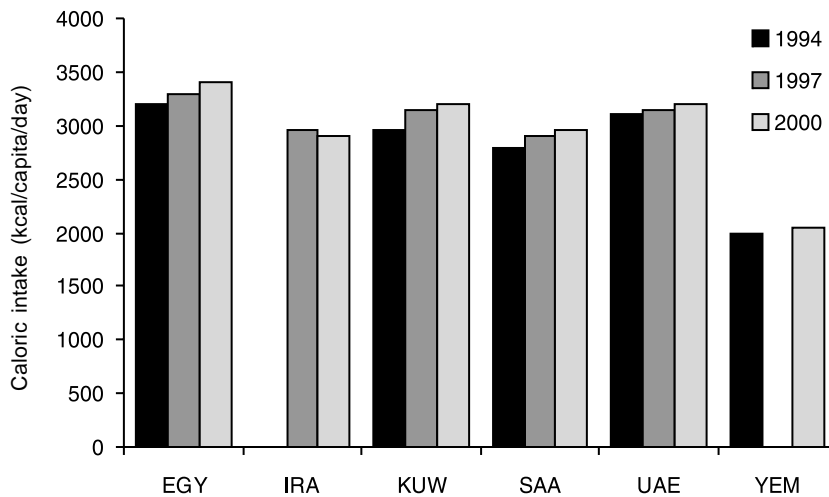


Figure 5 Trend in total daily caloric intake (kcal/capita) among selected Member States, 1994–2000 (Egypt, Iran, Kuwait, Saudi Arabia, United Arab Emirates, Yemen)

child/high adult mortality countries, i.e. the burden of cardiovascular disease as part of total NCD burden is similar.

The countries of the Eastern Mediterranean Region are, therefore, suffering from a double burden of both communicable and noncommunicable diseases. Within a short time, however, NCD will dominate the scene of health problems [14]. Regional and national data have shown that cardiovascular disease will impose the highest morbidity burden among NCDs in both the low child/low adult mortality and high child/high adult mortality countries [2,17-19].

### Strategic directions

In the Eastern Mediterranean Region, NCDs are the major cause of premature

adult death, representing a major health challenge. These conditions can be prevented and controlled using available knowledge. Without national strategic action, however, deaths from NCDs are expected to increase by 17% from 2005 to 2015 [2]. There are several problems facing countries of the Region in dealing with the challenge: lack of national risk factor surveillance; lack of harmonization of monitoring and surveillance methodologies; no linking of mortality data to NCD prevention and control; lack of availability of a model of integrated care for an NCD prevention programme; and inadequate national capacity-building and lack of programme sustainability.

Three main strategic directions are advocated. These are outlined below.

Table 4 Deaths by cause and mortality stratum in the countries of the Eastern Mediterranean Region, 2001

Variable	Countries				Total	
	Low child adult <sup>a</sup> No.	low mortality %	High child adult <sup>b</sup> No.	high mortality %	No.	%
Population (000)	141 835		351 256		493 091	
Deaths (000)						
Total	707		3 449		4 156	
Communicable disease	126	17.8	1 700	49.2	1 826	43.9
Noncommunicable disease (total)	475	67.2	1 454	42.2	1 929	46.4
Cardiovascular disease	280	62.1	757	22.0	1 037	25.0
DALYs lost (000)						
Total	23 007		113 214		136 221	
Communicable disease	5 691	24.7	61 446	54.3	67 137	49.3
Noncommunicable disease (total)	13 282	57.8	39 329	34.7	52 611	38.6
Cardiovascular disease	2 935	22.0	8 855	22.5	11 790	22.4

<sup>a</sup>Bahrain, Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia and United Arab Emirates.

<sup>b</sup>Afghanistan, Djibouti, Egypt, Iraq, Morocco, Pakistan, Somalia, Sudan and Yemen.

DALYs = disability adjusted life years.

### **Estimate population need and advocate for action**

There is a relatively long time between exposure to a risk factor and development of NCD. Consequently, the most effective strategy for surveillance is to focus efforts on the major NCD risk factors that predict disease. The population distribution of these risk factors is the key information required by countries in their planning of prevention and control programmes. It can also contribute to the monitoring and evaluation of these activities.

Many countries of the Region do not have a surveillance system for chronic diseases. Knowledge of NCD risk factors is important for predicting the burden of chronic disease in populations and for identifying potential interventions to reduce such burdens [1]. The *World Health Report 2002* identified 8 risk factors that contribute the most to mortality and morbidity, but which can be reduced through primary intervention and can be easily measured in populations [1]. They are tobacco use, alcohol use, physical inactivity, low fruit/vegetable intake, obesity, raised blood pressure, raised cholesterol and diabetes. In fact, the joint effects of tobacco use, raised blood pressure and raised cholesterol account for 65% of all cardiovascular disease in those above the age of 30 years.

In the STEPwise approach, WHO recommends 3 steps to implement effectively the approach to NCD surveillance ([http://www.who.int/ncd\\_surveillance/steps/resources/en/index.html](http://www.who.int/ncd_surveillance/steps/resources/en/index.html)). This is based on a conceptual framework that offers a distinction between different levels of assessment of risk factors, i.e. by questionnaires, physical assessments and blood samples. This requires national authorities to develop or strengthen the national surveillance system for NCDs and risk factors. Once pop-

ulation need is estimated, the information must be synthesized into advocacy for policy action at the national level.

### **Develop national policies, strategies and plans for NCD prevention and care and capacity-building**

As NCDs can be prevented and controlled using available knowledge, a comprehensive and integrated approach is required at country level, led by the government, and with the full participation of the whole community. The population-wide approach seeks to reduce the risks in the entire population. NCDs can be reduced by small reductions in the average population levels of several risk factors, such as tobacco use, unhealthy diet and physical inactivity, which in turn lead to population-level reductions in risk for cholesterol, blood pressure, blood glucose and body weight. Population-wide and individual approaches are complementary strategies that provide a continuum of interventions. Countries of the Region need to set up strategies for developing a model of integrated care for NCD prevention and national capacity-building.

There are 4 approaches to prevention [20,21]:

- Clinical prevention: interventions involving a health care provider and a recipient of care. Clinical prevention services are provided to individuals who may accept or decline the service or the recommended health actions. A physician counselling individual patients to quit smoking is an example of a clinical prevention activity.
- Health protection: interventions that reduce health risks by changing the physical or social environment in which people live. Prohibiting smoking in pub-



lic places is an example of a health protection intervention.

- Health promotion: interventions that aim at encouraging individual behaviours believed to produce positive health effects and discouraging behaviour that produces negative health effects. Health promotion interventions frequently take the form of public information campaigns. A media-based antismoking campaign is an example of health promotion; taxation on tobacco products to reduce use is another tool.
- Public health policy: social or economic interventions that affect health but do not have health as the main policy objective.

Preventive strategies need to focus on the population as a whole, or on the people identified as being at high risk of certain diseases. Thus, it is important to integrate a comprehensive approach to NCD at the primary care level. Primary care physicians at all levels need to integrate both preventive and promotive aspects into their practices. The comprehensive approach entails providing curative, preventive and rehabilitative care and active involvement of the patients, their families and the community. Primary health care physicians must also play their part in providing education in healthy living. Health care workers are thus role models and leaders in all matters that influence health.

#### **Promote and implement community participation in prevention and care of NCD**

Integrated community-based intervention programmes for prevention and care of NCD are comprehensive packages in which different kinds of activities are combined to produce a synergistic effect. The community approach in NCD prevention

has a high degree of generalization and cost-effectiveness, is able to diffuse information successfully and has the potential for influencing environmental and institutional policies that have a bearing on the health status of the population. Close collaboration between those implementing the community approach and the national health authorities is important to sustaining the programme and for influencing policy development in regard to health.

The people of the Region share a deeply-rooted health heritage. Recognizing this, in June 1989, a consultation was convened to respond to the need to formulate appropriate health messages for the people. This resulted in the Amman Declaration on Health Promotion [22]. As a part of integrated community-based intervention programmes for prevention and care of NCD, this Declaration can play a major role in our Region in helping to raise community awareness and involve the people in health promotion and disease prevention.

#### **Conclusion**

The need for a comprehensive vision to address the health and economic burden of NCD in the Eastern Mediterranean Region is clear and urgent. The current burden of NCD in the Region is a reflection of exposure to the main risk factors; the future burden will be determined by conducting reliable epidemiological population studies of the major risk factors. Regional and national strategies are essential for community mobilization and for developing and implementing successful and sustainable NCD prevention and control policies and programmes.

Experience in the Region has shown that a community-based approach is feasible and that prevention of NCD and NCD

risk factors can be successful through joint collaborative efforts and coalition between health providers and the community. Population-wide interventions that seek to reduce risk factors in the entire population are needed. There is strong evidence that the policies, strategies and plans for NCD prevention and control should be comprehensive and integrated, focusing on common risk factors.

Prevention and care of NCDs represent a challenging task, nationally and regionally. Advocacy is needed to raise awareness of NCD and create a climate for resource mobilization. Two key messages for advocacy are: NCDs are the major disease burden; NCDs are preventable using available knowledge, and solutions are effective and highly cost-effective. Research is needed

to explore the effectiveness of community-based programmes for NCD prevention and control. The aim is to gather solid evidence on the effectiveness of community-based programmes for NCD prevention in the Region, and for each country specifically. Community-based programmes need to be oriented appropriately with regard to regional cultures. National capacity-building is crucial to meeting national needs in tackling the NCDs and their determinants in the population.

As the regional mean prevalence for hypertension is 26.5% and diabetes prevalence is 14.5%, these 2 diseases represent a particularly important challenge to the Region, which requires early attention within the overall context of NCDs.

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