



## Health in the Arab world: a view from within 2

# Non-communicable diseases in the Arab world

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According to the results of the Global Burden of Disease Study 2010, the burden of non-communicable diseases (cardiovascular disease, cancer, chronic lung diseases, and diabetes) in the Arab world has increased, with variations between countries of different income levels. Behavioural risk factors, including tobacco use, unhealthy diets, and physical inactivity are prevalent, and obesity in adults and children has reached an alarming level. Despite epidemiological evidence, the policy response to non-communicable diseases has been weak. So far, Arab governments have not placed a sufficiently high priority on addressing the high prevalence of non-communicable diseases, with variations in policies between countries and overall weak implementation. Cost-effective and evidence-based prevention and treatment interventions have already been identified. The implementation of these interventions, beginning with immediate action on salt reduction and stricter implementation of tobacco control measures, will address the rise in major risk factors. Implementation of an effective response to the non-communicable-disease crisis will need political commitment, multisectoral action, strengthened health systems, and continuous monitoring and assessment of progress. Arab governments should be held accountable for their UN commitments to address the crisis. Engagement in the global monitoring framework for non-communicable diseases should promote accountability for effective action. The human and economic burden leaves no room for inaction.

### Introduction

The Global Burden of Disease Study (GBD) 2010 identified a clear shift between 1990 and 2010 in the number of deaths from communicable, maternal, neonatal, and nutritional causes to deaths caused by non-communicable diseases.<sup>1</sup> Two-thirds of the 52·8 million deaths worldwide in 2010 were caused by non-communicable diseases, with ischaemic heart disease, stroke, chronic obstructive pulmonary disease, lung cancer, and diabetes ranking among the top ten causes.<sup>1</sup> This trend is also true for the Arab world, particularly in middle-income and high-income countries where ischaemic heart disease is the number one cause of death.<sup>2</sup> Risk factors have increased substantially for the major non-communicable diseases (cardiovascular disease, cancer, chronic lung diseases, and diabetes). In nine Arab countries (Bahrain, Egypt, Jordan, Kuwait, Lebanon, Libya, occupied Palestinian territory, Tunisia, and Syria), the prevalence of daily tobacco smoking now exceeds 30% in men, and that of obesity, particularly in women, is alarmingly high.<sup>3-6</sup> The region has six of the ten countries in the world with the highest diabetes prevalence.<sup>7</sup>

Internationally, action against non-communicable diseases is gaining momentum, most notably with the political declaration of the UN General Assembly on the prevention and control of non-communicable diseases in 2011, and the subsequent monitoring framework.<sup>8,9</sup> Cost-effective and evidence-based prevention and treatment measures to address non-communicable diseases—called best buys by WHO—have been identified.<sup>10,11</sup> Arab governments need to engage with this international momentum and should be held accountable for their management of the non-communicable disease crisis, which threatens to derail an already fragile social and

economic development trajectory. The response of Arab countries to the crisis has so far been inadequate. The gap between epidemiological burden and policy response is surprising, given that a Global Burden of Disease Study, published in 1997, identified non-communicable diseases—notably cardiovascular disorders—as the leading causes of deaths in the Middle Eastern crescent (which included north Africa, the Middle East, Pakistan, and the central Asian republics of the former Soviet Union).<sup>12</sup> Subsequent evidence suggested that the greatest increase in non-communicable disease mortality rate between 2006 and 2015 was expected in Africa (27%) and the eastern Mediterranean region (25%), which includes most Arab countries.<sup>13</sup> The discrepancy between epidemiological data and policy response is partly caused by the weaknesses in the public systems (of which health systems are a part) and in the complex political, social, and economic environments in which these public systems operate.<sup>14</sup> Poverty, conflict, sex inequality,

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### Search strategy and selection criteria

We did an extensive review of work published between January, 2000, and October, 2013, in PubMed databases. The search language was English, with keywords including “noncommunicable diseases”, “obesity”, “cardiovascular disease”, “cancer”, “hypertension”, “salt interventions”, “physical activity”, “tobacco”, “Arab countries”, “health systems”, and “chronic disease”. Because Arab countries are classified differently by international organisations (namely WHO and the World Bank), search terms also included “Eastern Mediterranean Region”, and “Middle East and North Africa”. We searched for grey literature in both English and Arabic through colleagues and contacts in the region, including annual reports of ministries of health and unpublished policies. WHO’s Global Health Observatory data repository was used for non-communicable disease statistics, including mortality, risk factors, and health system response and capacity.

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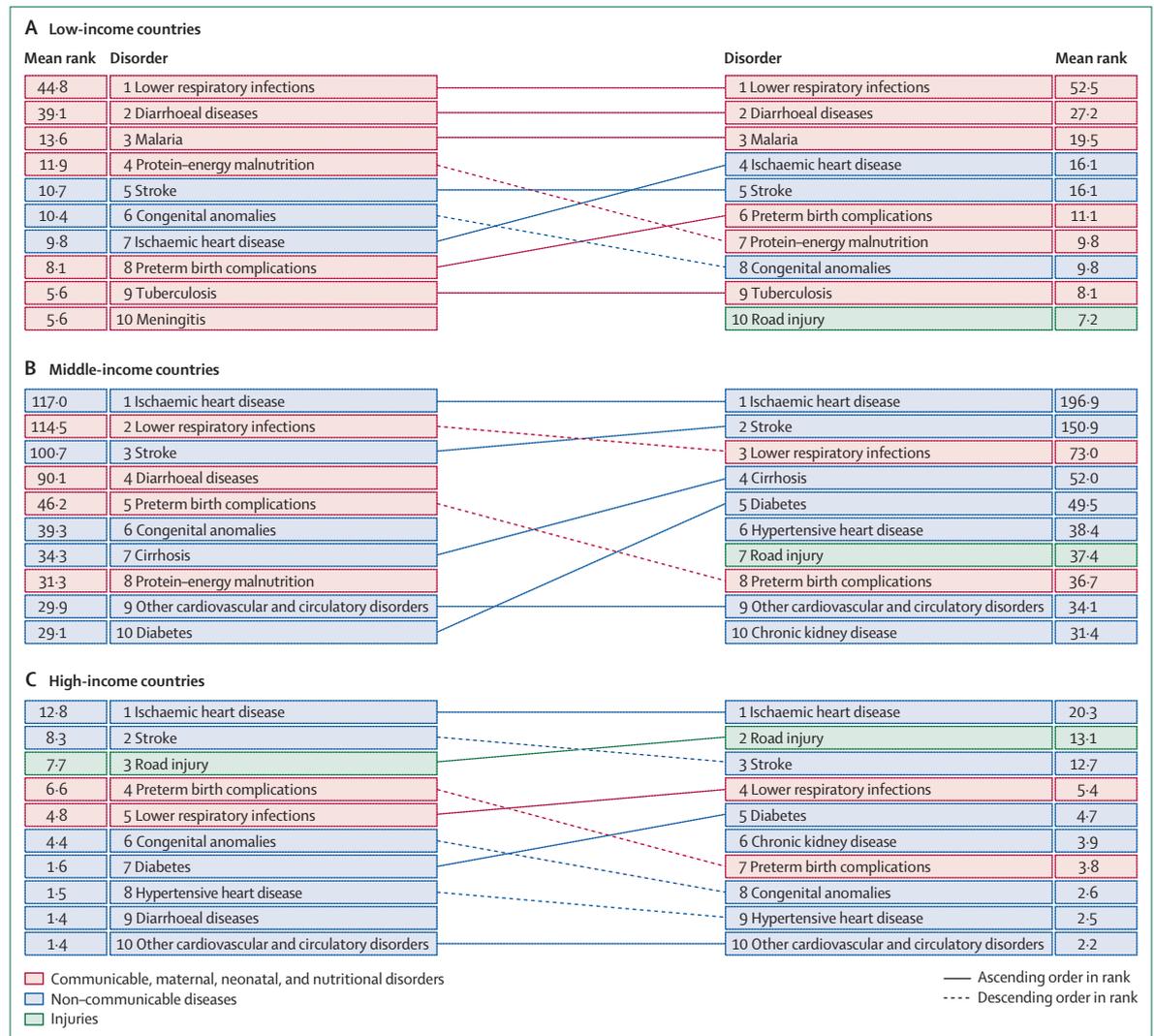
corruption, and lack of accountability have affected health in the Arab world to varying degrees, and Arab countries have substantial variation in the availability of resources for spending on health.<sup>15-17</sup>

This report will focus on current actions and future needs for an effective response to the non-communicable disease crisis. First, we briefly review the burden of non-communicable diseases and their risk factors in Arab countries. We summarise current actions to address non-communicable diseases and discuss the gaps between what needs to be done and what is being done. Following the proposed stepwise approach for national action to meet UN commitments on non-communicable diseases, we show where the focus of future actions must be shifted.<sup>18</sup> We will also draw attention to the challenges for effective action against non-communicable diseases.

**Mortality, morbidity, and disability burden**

In 2010, ischaemic heart disease and stroke were two of the top five causes of death in all income groups in the Arab world, whereas communicable diseases, such as respiratory infections, diarrhoeal diseases, and malaria continued to rank as leading causes of death in low-income countries (figure 1).

In 2008, more than 1.2 million people in the Arab world died from non-communicable diseases, accounting for nearly 60% of all deaths in the region, with wide variations between countries (ranging from 27% in Somalia to about 84% in Oman and Lebanon).<sup>19</sup> More than 34% of deaths from non-communicable disease related were in individuals younger than 60 years. We obtained data for age-standardised death rates (per 100 000) for non-communicable diseases in Arab



**Figure 1: Death ranks for top ten causes in the Arab world, 1990 to 2010**  
 Top ten causes of death and mean rank for low-income (A), middle-income (B), and high-income (C) Arab countries. Low-income Arab countries are Comoros, Djibouti, Mauritania, Yemen, and Somalia; middle-income Arab countries are Algeria, Egypt, Iraq, Jordan, Lebanon, Libya, Morocco, occupied Palestinian territory, Sudan, Syria, and Tunisia; and high-income countries are Bahrain, Saudi Arabia, Kuwait, Oman, Qatar, and the United Arab Emirates. Data are from Mokdad and colleagues.<sup>2</sup>

countries from Mokdad and colleagues' analysis<sup>2</sup> of GBD data, and grouped them according to level of income (figure 2). This figure shows a higher burden of non-communicable diseases in middle-income countries undergoing economic development than in high-income countries.

### Modifiable risk factors

Although prevalence of non-communicable diseases in the Arab world is expected to rise as more people live longer and infectious diseases are better controlled, a substantial proportion of the burden is caused by the modifiable risk factors of these diseases, including tobacco use, physical inactivity, and unhealthy diet.<sup>20</sup> Data for consumption of harmful amounts of alcohol show generally low levels of consumption and gaps in reporting, both of which might be due to the prohibition in Islam of alcohol consumption.<sup>21</sup> Although the burden of alcohol-related cancers and liver cirrhosis is expected to be low in this region, infection with hepatitis B and C viruses continues to be a risk factor.<sup>1</sup>

Attributable disability-adjusted life-years (DALYs) are a measure of a risk factor's contribution to premature death and disability. Figure 3 shows that between 1990 and 2010, attributable DALYs of all leading non-communicable-disease risk factors increased in the Arab world, except tobacco smoking, which fell in low-income countries.<sup>2</sup> Diet and high body-mass index (BMI) continued to be the risk factors with the highest attributable DALYs for non-communicable disease (figure 3).

Changes in the Arab diet are mainly characterised by an increased caloric intake and the replacement of the traditional diet with refined and processed foods and diets rich in fat and salt.<sup>22</sup> Data from regional STEPS surveys show that 79–96% of adults in Egypt, Jordan, Iraq, Kuwait, Saudi Arabia, Qatar, and Syria reported eating less than the recommended five servings of fruit and vegetables per day.<sup>5,23</sup> Available estimates of salt consumption range from 7.2 g/day per person in Lebanon to 19 g/day per person in Jordan, which are substantially higher than the WHO recommendation of less than 5 g/day per person for adults. About 20% of the total salt intake in the region comes from bread.<sup>24</sup>

We compared the prevalence of daily tobacco smoking, insufficient physical activity, and overweight and obesity in Arab countries and noted that the 2008 age-standardised prevalences of daily tobacco smoking in adults aged 15 years or older varied widely among the Arab countries,<sup>3–6</sup> from 3.4% in Oman<sup>4</sup> to 37.6% in Lebanon<sup>3</sup> (table). In all countries, men reported smoking more than did women, and the largest disparities were in Egypt, Algeria, Morocco, and Libya (table). Waterpipe smoking, which is mistakenly perceived as being less harmful than cigarette smoking, is increasing in young people living in the region, with prevalence estimates between 6% and 34% of those aged 13–15 years.<sup>25</sup>

The Arab region has countries with some of the highest levels of physical inactivity in the world.<sup>26</sup> Insufficient

physical activity is particularly prevalent in the high-income countries of the Gulf Cooperation Council (GCC; Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates)—almost 70% in Saudi Arabia—and in almost all Arab countries it is higher in women than in men (table).

The 2008 age-standardised prevalence rates of overweight and obesity in adults aged 20 years or older in Arab countries are alarmingly high (table). The prevalence of overweight is highest in high-income countries, but very high levels are also reported in some middle-income countries (table). In all countries, the prevalence of obesity was higher in women than in men (table). Using a population-based dataset of 199 countries between 1980 and 2008, Danaei and colleagues<sup>27</sup> showed that mean BMI increased for Arab men and women. In women, mean BMI increased per decade in high-income countries (by 1.29 kg/m<sup>2</sup> in Bahrain and 1.18 kg/m<sup>2</sup> in Saudi Arabia) and middle-income countries (by 1.67 kg/m<sup>2</sup> in Egypt and 1.38 kg/m<sup>2</sup> in the occupied Palestinian territory).<sup>27</sup>

The global obesity epidemic is not restricted to the adult population; it has also emerged as a public health concern in children and adolescents. Orsi and colleagues<sup>28</sup> reported data from the National Health and Nutrition Examination Survey (NHANES), the Pediatric Nutrition Surveillance System (PedNSS), and the National Center for Health Statistics (NSCH), showing high overweight and obesity rates in young children (ages studied ranged from 1 to 5 years), school-aged children (aged 6–11 years), and adolescents (age range

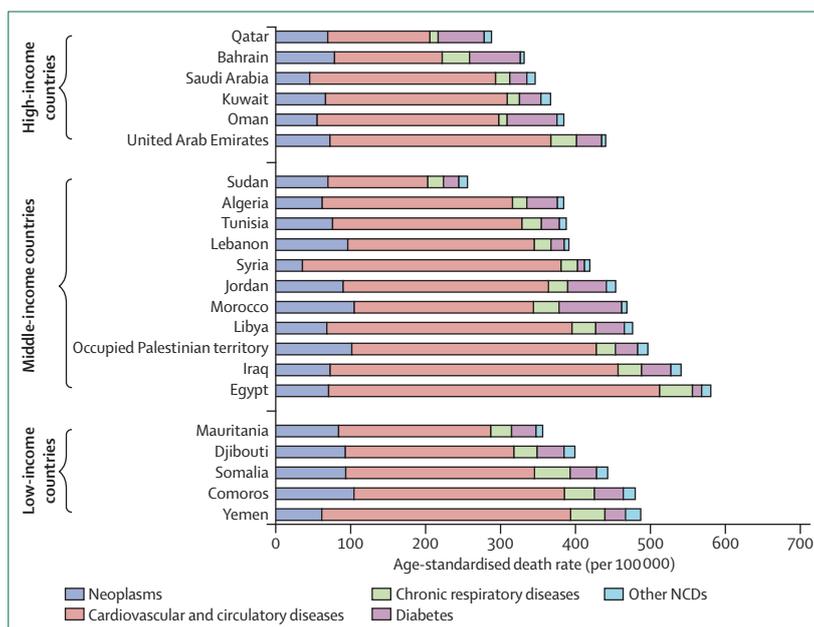
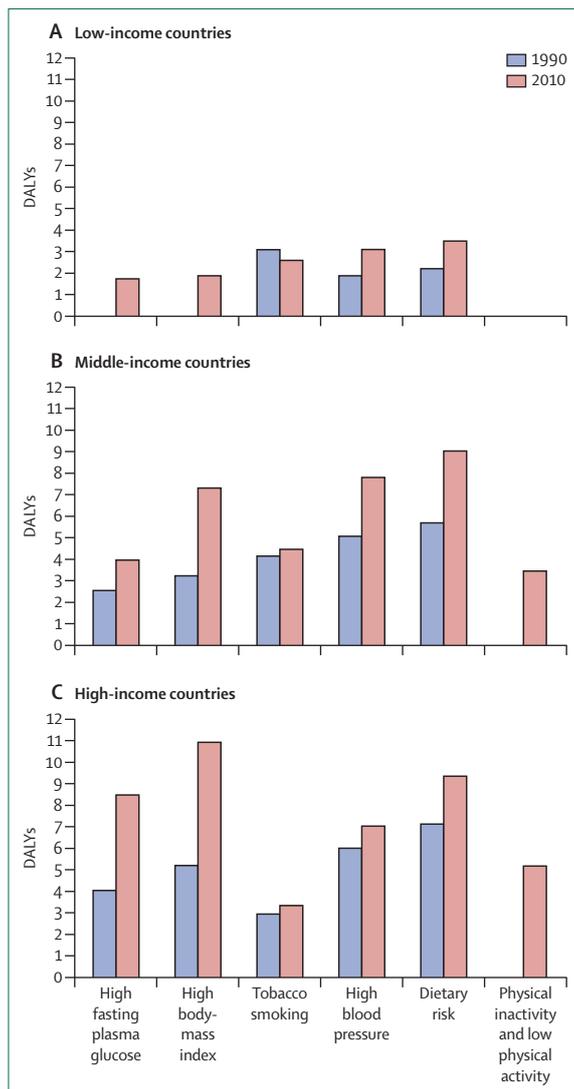


Figure 2: Age-standardised death rates from non-communicable diseases (per 100 000 population) in Arab countries, 2010

Arab countries have been grouped according to income level. Data are from Mokdad and colleagues.<sup>2</sup> NCD=non-communicable disease.



**Figure 3: Leading non-communicable disease risk factors and attributable DALYs in the Arab world, 1990 and 2010**

Low-income (A), middle-income (B), and high-income (C) countries of the Arab world. Low-income Arab countries are Comoros, Djibouti, Mauritania, Yemen, and Somalia; middle-income Arab countries are Algeria, Egypt, Iraq, Jordan, Lebanon, Libya, Morocco, occupied Palestinian territory, Sudan, Syria, and Tunisia; and high-income Arab countries are Bahrain, Saudi Arabia, Kuwait, Oman, Qatar, and the United Arab Emirates. Data are from Mokdad and colleagues.<sup>7</sup> DALY=disability-adjusted life-year.

10–19 years). This increase is of particular concern because paediatric obesity has been shown to continue into adulthood and to predict a broad range of adverse health effects such as hypertension, type 2 diabetes, and insulin resistance later in life (panel; figure 4).<sup>49–50</sup> The prevalences of overweight and obesity have increased in both young and adult populations of GCC countries, including Kuwait, Qatar, Saudi Arabia, and Bahrain, where 66–75% of the adult population (aged >18 years) and 25–40% of children and adolescents (<18 years) are estimated to be overweight and obese.<sup>51</sup>

### Changes in risk factors

Modernisation, economic development, and technological advances have brought rapid demographic and epidemiological changes to the Arab world. These changes are manifested by increases in death rates from chronic non-communicable diseases, replacing the once-dominant infectious diseases.<sup>13,52</sup>

The traditional Arab diet has changed from high-fibre and low-fat food with increased integration of the Arab world into the global market over the past four decades. Unhealthy dietary habits are prevalent in children, adolescents, and adults, especially in the wealthy GCC countries where a wide variety of global fast-food chains are near ubiquitous. People in the Arab countries have a high intake of fast food and carbonated beverages and a low intake of milk, fruits, and vegetables, and frequently consume snacks rich in calories, salt, and fat between meals, skip breakfast, consume foods outside the home, and eat while watching television.<sup>53–55</sup>

Paradoxically, although changes in diet typical of the nutrition transition have occurred,<sup>56</sup> political and economic problems in the Arab world have affected the availability of food, including the continued siege of the Gaza Strip in the occupied Palestinian territory, the embargo on Iraq in the early 1990s, the current conflict in Syria, and the recurring famine in Somalia. For varying periods, these factors have affected the availability of and access to foods of sufficient calorific value or nutritious variety. Increasingly, research has been pointing to the effects of malnutrition (both overnutrition and undernutrition) in pregnant women and during early life on the development of chronic diseases in adulthood.<sup>57</sup> As such, the long-term effects of these political events might yet be unseen.

Increased urbanisation has changed traditional lifestyles and occupation patterns to the detriment of physical activity.<sup>58</sup> People in GCC countries, for example, rely heavily on cars for transportation, have reduced physically demanding occupations, are increasingly using mechanised appliances, have domestic helpers, live in a hot climate, and spend an increasing amount of time watching television, using the internet, and playing computer games. In almost all countries in the Arab world, men are more active than are women because of conservative social norms and cultural restrictions on outdoor activities and exercise for women.<sup>59</sup>

### Way forward: a stepwise national response

A phased plan for national action on non-communicable diseases has been proposed that would include, in addition to strong political commitment, three crucial steps: plans to mobilise multisectoral support and to build necessary capacity; implementation of the most important feasible and cost-effective interventions; and accountability through monitoring and review of progress, and appropriate response.<sup>18</sup>

In the next section, we apply elements of the stepwise approach proposed by Bonita and colleagues<sup>18</sup> to the

	Current daily tobacco smoking			Insufficient physical activity*			Overweight (BMI ≥25 kg/m <sup>2</sup> )			Obesity (BMI ≥30 kg/m <sup>2</sup> )		
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total
<b>High-income countries</b>												
Bahrain	30.2%	7.4%	18.8%	..	..	..	70.2%	70.5%	70.3%	28.9%	38.2%	32.6%
Kuwait	31.2%	2.8%	17.0%	56.9%	72.1%	64.5%	78.1%	81.3%	79.3%	37.2%	52.4%	42.8%
Oman†	6.4%	0.3%	3.4%	..	..	..	57.8%	57.2%	57.5%	19.4%	25.9%	22.0%
Qatar‡	29.1%	0.6%	14.7%	37.4%	54.2%	45.9%	72.5%	71.3%	72.1%	30.8%	39.3%	33.1%
Saudi Arabia	8.5%	3.4%	6.0%	61.5%	76.2%	68.8%	70.2%	73.2%	71.3%	29.5%	43.5%	35.2%
United Arab Emirates	13.1%	1.2%	7.2%	56.1%	68.9%	62.5%	71.3%	73.9%	72.0%	30.2%	43.0%	33.7%
<b>Middle-income countries</b>												
Algeria	24.2%	0.2%	12.2%	31.9%	49.2%	40.5%	41.8%	54.5%	48.2%	10.7%	24.3%	17.5%
Jordan	47.6%	4.9%	26.3%	..	..	..	66.5%	71.2%	68.8%	27.3%	41.7%	34.3%
Lebanon	44.6%	30.7%	37.6%	51.9%	41.7%	46.8%	67.0%	58.7%	62.8%	26.4%	29.7%	28.2%
Libya	45.2%	0.2%	22.7%	37.3%	54.4%	45.8%	60.4%	71.0%	65.4%	21.5%	41.3%	30.8%
Tunisia	55.6%	6.6%	31.1%	31.5%	40.3%	35.9%	47.5%	64.2%	55.9%	13.9%	33.4%	23.8%
Egypt	37.2%	0.6%	18.9%	..	..	..	62.4%	76.9%	69.8%	22.5%	46.3%	34.6%
Iraq	26.6%	2.9%	14.8%	62.8%	54.0%	58.4%	62.2%	68.2%	65.2%	22.3%	36.2%	29.4%
Morocco	28.9%	0.2%	14.5%	..	..	..	43.1%	53.6%	48.5%	11.1%	23.1%	17.3%
Occupied Palestinian territory§	36.2%	2.2%	19.3%	33.8%	59.2%	46.5%	55.2%	60.7%	57.8%	23.3%	30.8%	26.8%
Sudan	23.1%	2.2%	12.7%	..	..	..	..	..	..	..	..	..
Syria	38.9%	..	..	..	..	..	63.4%	69.3%	66.4%	23.8%	39.0%	31.6%
<b>Low-income countries</b>												
Comoros	20.1%	8.9%	14.5%	6.1%	10.6%	8.3%	19.4%	21.1%	20.1%	3.5%	5.3%	4.4%
Mauritania	28.4%	3.6%	16.0%	40%	47.6%	43.8%	22.8%	53.9%	38.7%	4.3%	23.3%	14.0%
Yemen	29.3%	8.0%	18.6%	..	..	..	..	..	..	..	..	..
Somalia	..	..	..	..	..	..	..	..	..	..	..	..
Djibouti	..	..	..	..	..	..	..	..	..	..	..	..

Data are age-standardised adjusted estimates of prevalence. Data are from the WHO global status report on non-communicable diseases 2010 (which refers to 2008 data),<sup>2</sup> unless otherwise specified. No data were reported for Somalia or Djibouti. BMI=body-mass index. \*2008 estimated prevalence; †insufficient physical activity is defined as less than five times 30 min of moderate activity per week, or less than three times 20 min of vigorous activity per week, or equivalent. ‡Data are from Al Riyami and Afifi. §Data are from Haj Bakri and Al-Thani. ¶Data for current daily smokers, low level of total physical activity (defined as <600 metabolic equivalent min per week), and overweight and obesity were obtained from the occupied Palestinian territory STEPS survey 2010–11<sup>4</sup> for persons aged 15–64 years.

**Table: Tobacco smoking and insufficient physical activity in adults aged ≥15 years and overweight and obesity in adults aged ≥20 years in Arab countries**

situation in Arab countries, with emphasis on its specific challenges and limitations. We will also make recommendations for priority actions.

## Planning

Accurate and relevant data are needed for effective planning. However, relative to other regions, data for non-communicable diseases and their risk factors in Arab countries are rather sparse. Particularly scarce are implementation studies that assess intervention programmes and monitor population-based policies. Existing studies are mostly descriptive, and there is little evidence that they are being used in programme design or policy formulation.<sup>60</sup>

Although non-communicable diseases will be treated in the health sector, prevention efforts need to extend well beyond this sector to include the education, agriculture, transport, urban planning, and finance sectors. In the Arab world, weak public institutions, and inadequate governmental oversight and regulation of key organisations that affect public health, are unlikely to lead to effective

intersectoral collaboration or to successful collaboration with private sector and special interest groups (such as the food, hospitality, or tobacco industry). Without the cooperation of these sectors, the structural and environmental factors that contribute to non-communicable diseases will persist (eg, unaffordable fresh fruits and vegetables, packaged foods with high trans-fat and salt contents, uncontrolled advertising that targets young people) and thereby negatively affect behavioural risk factors.

With the exceptions of Libya and Somalia, all the Arab countries have a governmental unit, branch, or department responsible for non-communicable diseases; the funding and staffing for these units vary (appendix). Furthermore, the effects of these units are unlikely to extend beyond the health sector. A national-level body consisting of stakeholders across the government and from civil society and the private sector, endorsed by the highest political authority and empowered to effect the necessary regulatory changes, will more effectively lead and implement useful measures to address non-communicable diseases. A high-level political decree

See Online for appendix

**Panel: Obesity and undernutrition in early life in the Arab world**

Recently, attention has been directed towards a developmental rather than a degenerative hypothesis linking maternal diet and inadequate nutrition in early life to endocrine, physiological, and metabolic adaptations that might increase sensitivity to the lifestyle-related risk factors leading to obesity and other non-communicable diseases later in life.<sup>29,30</sup> Evidence is accumulating that metabolic events during the crucial periods of prenatal and postnatal development have substantial modulating effects on adult health.<sup>31</sup> Such lifelong programming events are regulated by undernutrition and stunting in early life followed by rapid weight gain during late childhood and adolescence, and by faulty early feeding practices that seem to constitute an epigenetic basis for common non-communicable diseases. A combination of factors have probably contributed to the increasing prevalence of non-communicable diseases reported in countries of the Arab world,<sup>32</sup> for which available studies have documented a high prevalence of obesity in children younger than 5 years, inadequate maternal and infant feeding practices, and faulty growth patterns, which warrant thorough investigation.<sup>33</sup>

Although few data exist for the association between dietary patterns and disease in the Arab world, the implication of these trends for adult health is still questioned. A study of Lebanese adults (aged >18 years) has related a diet of fast food and dessert with metabolic syndrome and hyperglycaemia,<sup>34</sup> whereas a national study of Lebanese adults (aged 20–55 years) has reported an association between this type of diet and higher body-mass index.<sup>35</sup> Additionally, reports from the region have suggested that children younger than 5 years have less than optimal growth patterns and dietary practices. A review by Khanna and colleagues<sup>36</sup> shows that, in countries undergoing a nutrition transition, fetal growth failure followed by excessive weight gain increases the exposure to risk factors for later-onset chronic diseases.

Although undernutrition is the biggest contributor to child mortality in the eastern Mediterranean region—with 15% of the global burden among newborn babies and young children occurring in this region<sup>37</sup>—some countries have a double burden of malnutrition, with the coexistence of child stunting and overweight in children younger than 5 years. Although research on undernutrition and overnutrition in the Arab world is scarce, available figures show that the region has similar malnutrition indicators—stunting (28%), underweight (11%), and wasting (9%)—to those reported in children younger than 5 years in other developing countries.<sup>38</sup> However, available data<sup>39–46</sup> suggest that rates of overweight and obesity in children younger than 5 years are similar to rates reported in developed countries (11.7%), including those in Europe and North America, and Japan.<sup>47</sup> Prevalence of obesity in children younger than 5 years in Arab countries ranges between 6.5% and 9.9%, which is similar to rates documented in the USA (10.4%).<sup>39</sup> This high prevalence of obesity in young children is worrying, because this trend is known to continue into adulthood, thereby increasing risk for later-onset chronic diseases.

The pre-post natal period has been referred to as a crucial window of opportunity for interventions to curb the growing epidemic of chronic non-communicable diseases.<sup>48</sup> The importance of inadequate early feeding patterns and dietary practices at this crucial phase in life calls for early-life nutrition to be a strategic priority at the core of national agendas.

should be issued to form these national-level bodies, indicating their scope and importance.

In terms of data and information needs, research into the capacity of health systems to implement policies for non-communicable diseases, taking into account specific contextual factors and competing interests, is urgently needed.<sup>61</sup>

Studies that clarify the associations between risk factors for non-communicable diseases and broader economic policies are needed. Equally, research findings

need to inform policy options that can be used by decision makers as the basis for action. An example is the link between non-communicable diseases and food security. As one of the most food-insecure regions in the world, the Arab world is highly dependent on food imports and is also very susceptible to changes in global food prices. Rising food prices, increasing poverty, and even government subsidies for some foods drive people to buy cheaper, more energy-dense, and less nutritious foods, which contribute to the increasing burden of non-communicable diseases. These forces are beyond the capacity of the health sector.<sup>62</sup>

Mobilisation of intersectoral action will also require deployment of different types of evidence from that used traditionally. In tobacco control, for example, a political economy analysis to address the effectiveness of tobacco control policies and the barriers to their implementation in the Arab world has not been done, despite this region having half of the 16 state-owned tobacco companies worldwide (Yemen, Egypt, Libya, Algeria, Iraq, Syria, Tunisia, and Lebanon).<sup>63</sup> Understanding specific contextual factors and competing interests is likely to be more effective than using a health argument alone.

**Implementation****Reorientation and strengthening of health systems**

Having a burden of communicable and nutritional diseases for many years, health systems in most Arab countries are still oriented towards curative and episode-based care. Reorientation of the health system is needed towards outreach, prevention and management of several risk factors, management of comorbidities, counselling, and patient self-management.

Despite differences in resources, Arab countries need to have universal health coverage to guarantee access to health care and thereby improve health outcomes. Out-of-pocket expenditures on health care, which can have catastrophic effects on households, vary greatly across the region, being lowest in the wealthy GCC countries (11–18% of total health expenditure) and highest in Sudan and Yemen (70–80%).<sup>64</sup> Political commitment is needed at the highest level for the implementation of universal health coverage. Action needs to be supported with reliable data and sound economic analyses from national surveys and health accounts to make the case for additional funding.<sup>65</sup>

In terms of health expenditure, most investments are made in tertiary-care-oriented services rather than public health services and prevention. Data for the proportion of total health expenditure that goes to public health and preventive activities are very difficult to obtain, especially when most Arab countries do not have national health accounts. The Global Health Expenditure Database<sup>66</sup> contains data for public health expenditures for less than half the Arab countries, and in some cases, the estimates are a decade old. Nevertheless, available estimates range from a low of 1% (Lebanon, 2004) to a high of 10% (Egypt, 2002). Expenditure on non-communicable diseases is

also adversely affected in Arab countries that depend heavily on international aid, such as the occupied Palestinian territory, where non-communicable diseases became a priority target only recently.<sup>67</sup>

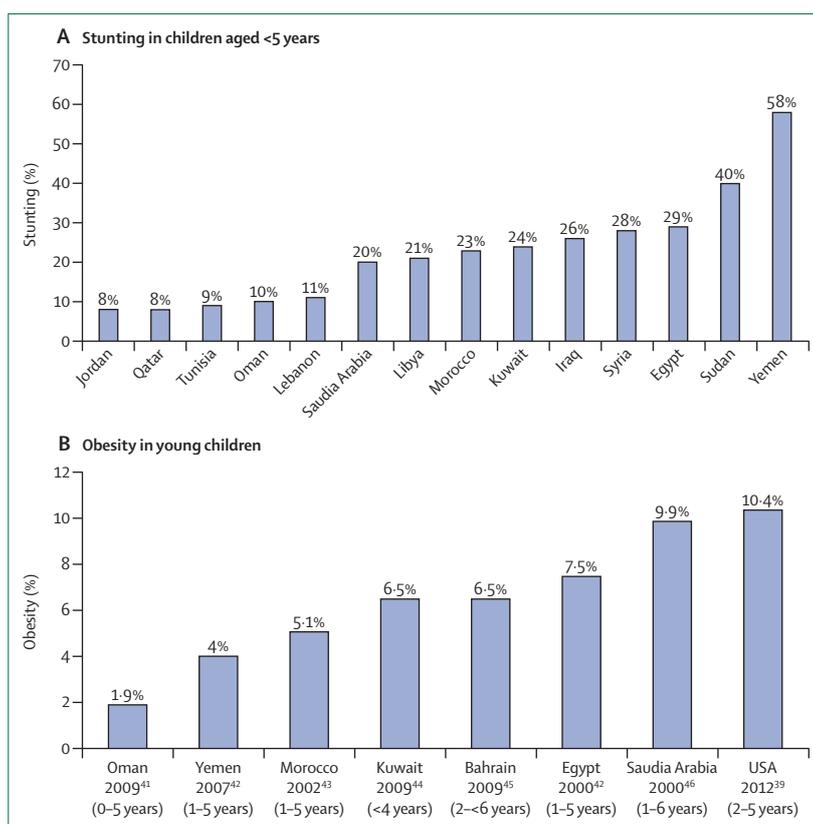
Non-communicable diseases are often diagnosed at a late stage in the Arab world, when people are admitted to hospitals with acute events or long-term complications and disabilities. At the same time, access to drugs and technologies is not sufficient. Strengthening of primary health care is a necessary strategy to deliver preventive and curative care, for the general population and for individuals at high risk or already diagnosed with one or more non-communicable diseases.

Several actions are needed to reorient services to non-communicable diseases.<sup>68</sup> The chronic nature of non-communicable diseases requires a team approach—necessitating an increase in the number, composition, and skills of primary health-care professionals besides physicians—that includes nurses, laboratory technicians, and health educators. Curriculum development and in-service training are needed for primary-care physicians to assess risk factors and implement early and appropriate prevention interventions using evidence-based guidelines for risk assessment and management. In addition to the appropriate training of health workers, close follow-up and supportive supervision are essential to ensure quality and consistency of care. Although several countries in the region are trying to adopt the family-practice model, there is a shortage of adequately trained family physicians who can deliver preventive care and effective treatment at the primary-care level.<sup>65</sup>

With the appropriately qualified and trained workforce, frequently used health services can be used to provide selected interventions for non-communicable diseases as well.<sup>69</sup> For example, most countries in the region have well established maternal and child health services in which prevention and management of non-communicable diseases can be integrated. Such integration might result in synergy, not only in service delivery, but also in monitoring and assessment, community engagement, and mobilisation, which could save costs.<sup>69</sup> Indeed, maternal and child nutrition services are an example of an intervention that can have long-term effects on the incidence of cardiovascular and other non-communicable diseases in later life.

Continuity between levels of care is needed, linking primary health care to secondary and tertiary levels through a coherent system of referral and re-referral. Such a strategy also needs reliable records and a strong health information system that allow accurate assessment and effective management of non-communicable diseases and their risk factors.

In view of the diversity in resources and in organisation of health services across the Arab world, the scope of interventions needs to be put into context, ranging from interventions targeting individuals at highest risk to those directed at primary prevention.<sup>69</sup>



**Figure 4: Prevalence of stunting and obesity in young children in selected countries of the Arab world** (A) Proportion of children younger than 5 years with stunting in Arab countries for which data were available. Data for Kuwait, Lebanon, Libya, Morocco, Qatar, Saudi Arabia, Sudan, and Yemen are from a 2009 UNICEF report on tracking progress on child and maternal nutrition;<sup>40</sup> data for Egypt, Iraq, Jordan, Oman, Tunisia, and Syria are from a 2012 UNICEF report on the state of the world's children.<sup>47</sup> (B) Proportion of young children who are obese in Arab countries for which data were available, and in the USA (for comparison); data are from various sources.<sup>39,41–46</sup>

### Delivery of best buys to address the crisis

Best buys are proposed as a core set of non-communicable-disease interventions for national scale-up and as a starting point for work towards universal coverage.<sup>11</sup> On the basis of country situations, resources, and capacity, which vary greatly in the Arab world, other interventions need to be added and implementation and coverage need to be gradually expanded using a primary health-care approach. Although a comprehensive set of non-communicable-disease interventions could be implemented in high-income countries in the region, feasibility in low-income and middle-income countries will depend on the level of health-care spending, competing health priorities, and capacity of the health system.

Factors specific to each country need to be considered—eg, human resources are a central component of any non-communicable disease strategy and can greatly affect the possibility of sustained improvements in the health sector. In most of the wealthy Gulf Cooperation Council countries, reliance on the transient expatriate population is not conducive to the

development of sustainable long-term skills in the health sector (and others), nor to the transfer of knowledge and experience. Therefore, any national strategy should include the gradual development of national capacity.<sup>65</sup>

Another important factor for some countries in the Arab world is conflict—from drawn-out occupation in the occupied Palestinian territory to the unstable aftermath of the invasion of Iraq and the current revolution in Syria. Such factors affect the availability of a health workforce and the capability of health systems to function.<sup>14</sup> They also restrict a country's ability to apply the measures needed for effective prevention of non-communicable diseases, such as control over imports (eg, of healthy food) and taxation (eg, of tobacco products), and control of the increase in risk behaviours as a result of high levels of psychological distress.

#### **Actions to address tobacco consumption**

The WHO Framework Convention on Tobacco Control has been signed or ratified by most Arab countries,<sup>70</sup> but tobacco use in the region has been increasing. WHO's global tobacco report<sup>71</sup> shows that Arab countries still lag behind other countries with respect to policies for tobacco control. Policies for promotion of smoke-free environments, labelling of products, and taxation are particularly scarce (appendix).

Implementation of tobacco control measures has challenges. First, effective tobacco control mechanisms fall largely outside the health sector. The implementation of smoke-free environment legislation, for example, might be under the authority of the Ministry of Interior, and taxation of cigarettes might be the remit of trade rather than health authorities. Second, control measures are subject to complex interactions between political and economic forces and to the strategies used by transnational tobacco companies.<sup>16</sup> Examples of industry tactics that have been used in the region include targeting of young people, circumvention of existing laws, dissemination of misinformation, lobbying of government officials, and even smuggling of tobacco products to closed markets.<sup>16</sup>

Although important tobacco-control initiatives have been implemented in some Arab countries—eg, pictorial warnings<sup>72,73</sup> and smoke-free spaces and to a lesser extent cigarette taxation—genuine political commitment to full implementation of the MPOWER measures<sup>71</sup> to reduce the demand for tobacco is needed (appendix). Reduction in tobacco demand also requires systematic and effective health education campaigns, and counselling and cessation support services that can be provided at the primary-care level.

Fortunately, anti-tobacco coalitions formed in Lebanon and the occupied Palestinian territory have been successful in bringing together academics, non-governmental organisations, media, and health professionals. In Lebanon, the efforts of this broad-based coalition were

instrumental in passing the tobacco control law. Involvement of civil society will be important in anti-tobacco efforts in Arab countries.

#### **Actions to address unhealthy diets**

National policies, programmes, and action plans to improve diet and increase physical activity are undeniably important for non-communicable-disease prevention, but little is known about their scope and content in the Arab world (appendix). More importantly, the realities of implementation are likely to be very different from the written policies. Results of a review of diet and physical activity policies in low-income and middle-income countries showed that availability of policy documents was particularly low for the eastern Mediterranean region.<sup>74</sup> Of the countries in the region, only Jordan had a policy that addressed all four risk factors: salt, fat, fruits and vegetables, and physical activity. In particular, the review reported that diet and physical activity policies tended not to be associated with specific action plans, timelines, and budgets, and they were also mostly focused on individual behavioural changes, with little involvement of the private sector.<sup>74</sup> Policies that link to specific budgets and priority actions, and involve a broader range of stakeholders, are needed. Importantly, pricing regulations are needed to ensure that fruits and vegetables are more affordable than processed foods, thus targeting both obesity and micronutrient deficiencies.<sup>75</sup>

Evidence from the large-scale INTERSALT study (which does not include any Arab countries) shows that population-wide decreases in salt intake will reduce the risk of coronary and stroke deaths.<sup>76</sup> Even slight reductions in salt intake will result in substantial reductions in medical costs and cardiovascular events.<sup>77</sup> Reduction in salt intake can be achieved with behaviour modification efforts (through advertising and health education campaigns) and reformulation of food products by industry.<sup>78</sup> In the Arab world, bread is a big source of salt in the diet, and should be the first target for reformulation by gradual reduction. Studies on salt consumption are a priority in the region, with the aim to reduce salt consumption by 30% by 2025.<sup>24</sup> Surveillance of sodium intake requires 24 h urinary studies, none of which are being done in any Arab country.

In high-income and middle-income countries, reduction of trans-fat consumption has been addressed through mandatory labelling of the trans-fat content in foods and voluntary agreements with the food industry.<sup>79</sup> Little information about trans-fat intake in the Arab world is available. A recent study in Jordan showed a high and variable content of trans fat in both locally produced and imported foods.<sup>80</sup> The WHO Regional Office for the Eastern Mediterranean has proposed various policies to reduce trans-fat intake, including further studies on trans fat with respect to labelling, pricing regulations, and import restrictions.<sup>24</sup> Health

education campaigns are needed to educate consumers about trans fats.

### **Actions to address inadequate physical activity**

Monitoring of physical activity is weak in the region; less than half of Arab countries did not have data for this risk factor.<sup>81</sup> This lack of data is particularly worrying because of the reported prevalence of inactivity in countries that do have data, and the rising levels of overweight and obesity, especially in women. Capacity to promote physical activity and implement effective policies and interventions to encourage greater physical activity is inadequate and needs to be improved in the primary health-care sector and also in schools and other appropriate settings.

Participation in sports has gained momentum in the region, with Qatar's winning bid to host the 2022 International Federation of Association Football (FIFA) World Cup, which could be an opportunity to promote sports, especially among children and young adults. Mass media will also have an important part to play.

In addition to promoting leisure-time physical activity, active lifestyles need to be encouraged in the region. However, urban spaces will need to be redesigned to provide a more supportive environment.

## **Accountability**

### **Monitoring and assessment**

The capacity of the Arab region to undertake surveillance and to provide stakeholders with timely information needed for development and assessment of policies and programmes varies greatly across countries and is generally inadequate.<sup>82</sup> Only ten Arab countries have done population-based national surveys, 12 have government funding allocated for non-communicable disease surveillance, monitoring, and assessment, and eight have a national health reporting system for non-communicable-disease risk factors.<sup>79</sup> These indicators point to an inadequate capacity for the gathering of information about non-communicable-disease risk factors and for surveillance.

In addition to surveillance data, well designed studies are needed for the assessment of the effect of interventions and provide meaningful input for policy formulation and future interventions. An example of a large, community-based intervention in Oman is the Nizwa Healthy Lifestyle Project (appendix). The assessment documented changes in the levels of risk factors; however, the design did not allow for conclusive statements on the effects of the intervention that were independent of possible confounding variables (appendix).

### **Strong political commitment**

Political commitment at the highest national levels is crucial for the implementation of the phased response to the non-communicable-disease crisis in the Arab world. Governments should be held accountable for compliance with international frameworks through

monitoring and reporting, not only of risk factors and non-communicable-disease morbidity and mortality, but also of implementation of multisectoral policies and effective interventions and the provision of adequate financial and regulatory support.

The political declaration resulting from the high-level meeting of the UN General Assembly in September, 2011, recognised the human and economic burden of non-communicable diseases (principally cardiovascular disease, cancer, chronic lung diseases, and diabetes) as an issue of development as well as health.<sup>8</sup> A monitoring framework containing nine voluntary targets was endorsed by the World Health Assembly in May, 2013, focusing on assessing reductions in exposure to the main risk factors of non-communicable diseases, progress in reduction of associated morbidity and mortality, and health systems' responses.<sup>9</sup> Defining a clear set of targets and indicators should streamline efforts in the fight against non-communicable diseases and raise international and national accountability, which has so far been insufficient.

The Arab world seems to have a growing recognition of the enormity of the non-communicable-disease crisis and its economic and health effects, and possibly new momentum for action. The high-profile Riyadh Declaration (September, 2012), which was the first regional response to the UN political declaration on non-communicable diseases, was held under royal patronage and pledged multisectoral cooperation and commitment of governments and civil society in the Arab world and the Middle East to scale up the fight against non-communicable diseases and implement the political declaration of the UN General Assembly on non-communicable diseases prevention and control.<sup>83</sup> The Riyadh Declaration also pledged to advance the implementation of the best-buy interventions in the Arab world, involving all relevant sectors and civil society as appropriate.

Successful implementation of the Riyadh Declaration will depend on countries' abilities to overcome some of the barriers that have been slowing progress in the fight against non-communicable diseases, such as inadequate intersectoral collaboration, prioritisation of non-communicable disease reduction, and funding for prevention and treatment. Endorsement by heads of governments will lead to actions across sectors to implement effective population-wide prevention strategies that could have a rapid effect on the increase in non-communicable diseases.

### **Cost of inaction**

With one of the youngest populations in the world, the Arab region stands to reap the economic benefits of the demographic dividend, provided that the appropriate educational and labour policies and investments are put in place.<sup>84</sup> However, the human and economic burden of non-communicable diseases might well derail this pros-

pect. In addition to necessitating increased health and social welfare spending, non-communicable diseases also lower the labour supply and labour outputs.<sup>85</sup> An analysis of the economic burden of non-communicable diseases in Egypt, for example, showed that people who reported having non-communicable diseases worked fewer hours (an average of 22 h less per week), which reduced the aggregate labour supply to 19% below its potential, leading to an estimated overall 12% loss in the country's gross domestic product.<sup>86</sup> Such analyses emphasise the need to tackle the rise in non-communicable diseases in the Arab world as a development imperative. Going forward, Arab countries should engage with the enormous amount of international activity that is now happening to reduce the prevalence of non-communicable diseases, especially as the Millennium Development Goals will come to an end in 2015. Experience, in the Arab world and elsewhere, has shown that clear targets increase accountability, which is much needed.

#### Contributors

HFAR is the lead and corresponding author. HFAR, AS, YK, NH, AM, and AH conceptualised the first draft, and HFAR, AS, YK, NH, AH, HA, and SM contributed to writing segments of the paper. IF, AM, and AHM provided data and comments, and all authors reviewed and commented on several drafts of the paper.

#### Conflicts of interest

We declare that we have no conflicts of interest.

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