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Special issue on scaling up prevention and control of noncommunicable diseases in the Eastern Mediterranean Region

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Printed by WHO Regional Office for the Eastern Mediterranean

Scaling up action on the prevention and control of noncommunicable diseases in the WHO Eastern Mediterranean Region

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Citation: Fikri M, Hammerich A. Scaling up action on the prevention and control of noncommunicable diseases in the WHO Eastern Mediterranean Region. *East Mediterr Health J.* 2018;24(1):3–4. <https://doi.org/10.26719/2018.24.1.3>

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Noncommunicable diseases (NCDs) are the leading causes of death worldwide. They are responsible for approximately 68% of global mortality each year, with cardiovascular diseases, cancers, diabetes, and chronic respiratory diseases being the four main NCD killers. It is estimated that annually, 16 million people die prematurely (before the age of 70) as a result of NCD (1). The majority of NCD deaths (74%) occur in low- and middle-income countries, where this public health crisis is especially challenging due to severe social and economic conditions already faced (1).

In the Eastern Mediterranean Region (EMR), currently around 60% of deaths are attributed to NCDs. The Region also suffers from some of the highest rates of NCD-related risk factors, such as physical inactivity, obesity, tobacco, and high salt, sugar and fat intake (2). Despite this, with sound and committed national, regional as well as international efforts, the burden of NCDs in the Region could be controlled.

The Political Declaration of the High-level Meeting of the UN General Assembly on the Prevention and Control of NCD in September 2011 clearly identified these diseases as a threat to socioeconomic development, and called for inclusion of their prevention and control in all governmental programmes (3). The Declaration commits Member States to creating a clear governance structure integrating all aspects of NCD control; i.e. surveillance, prevention and quality health care. They have also recognized the need for multisectoral cooperation between health and non-health government agencies, private industry, academic institutions and civil and international organizations. Cross-governmental “health-in-all-policies” initiatives have recently gained momentum in several countries of the Region.

In May 2013, the World Health Assembly endorsed the WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020. This Global Action Plan provides Member States, international partners and WHO with a road map and menu of policy options based on nine global NCDs targets, to be attained by 2025, including the number one target: to achieve a 25% relative reduction in premature mortality from NCDs by 2025.

Following these global commitments, a number of initiatives have taken place at the regional level. One of the guiding documents is the Eastern Mediterranean

Regional Framework for Action on Noncommunicable Diseases. This framework was endorsed at the WHO Eastern Mediterranean Regional Committee in 2012, and includes 17 strategic interventions and 10 monitoring indicators, covering the areas of NCD governance, prevention, surveillance and healthcare. Moreover, NCDs are a priority area in the WHO Eastern Mediterranean Regional Director’s Roadmap for 2017–21 (4). Progress is being monitored on an annual basis through development of country progress factsheets on NCDs. The factsheets provide an update for each of the 22 countries, on whether they are fully implementing, partially implementing or not implementing each of the progress 17 sub-indicators.

To date, seven countries in the Region are fully achieving over six of the sub-indicators; however, the remaining 15 countries are fully achieving less than one-third of the sub-indicators. Progress is slowest in the areas of planning and surveillance, and tobacco control. In addition, WHO Regional Office for the Eastern Mediterranean has developed a number of additional tools to scale up progress across the NCD agenda. These include: diabetes and cancer progress sheets; priority legal interventions to address NCDs in the Region; a framework to scale up mental health; a framework on NCD integration in primary health care; and a framework for cancer prevention and control.

In 2015, heads of states and governments committed themselves at the United Nations General Assembly to develop national responses for implementation of the 2030 agenda for Sustainable Development, which includes five goals related to NCDs, to be attained by 2030, more commonly known as the “33% reduction by 30” targets (5). The Sustainable Development Goal (SDG) agenda reinforces our work in the prevention and control of NCD and achievement of related targets in the Region.

However, despite an overall high political commitment, regional progress in implementing the UNPD is uneven and insufficient to achieve NCD global voluntary and SDG-related targets. Regional implementation challenges include: emergencies and political instability; competing development priorities and inadequate commitment; limited health system capacity; weak multisectoral and multi-stakeholder collaboration; incoherent policies and competing interests (industry and trade promoting unopposed

marketing); and unsustainable funding and human resources. With WHO support and other partners, countries need to address those challenges to scale up their national responses and improve progress at three important milestones, namely 2018 – for the four time-bound commitments; 2025 – for the nine voluntary global targets; and 2030 – for reducing deaths from NCDs by one third. We must also ensure that these milestones are to be achieved through guidance by the regional framework and country tracking sheets. These are the tools for reviewing progress, catalyzing action and identifying areas for further work in the prevention of NCDs.

The good news is that there is now plenty of evidence of what works. It is up to countries to implement these “best buys” for NCD prevention and control, in their respective national context. The following interventions are recommended to lead the way forward in the EMR to achieve the NCD-related goals outlined for 2018, 2025 and 2030:

1. Scaling up implementation of all time-bound commitments and NCD voluntary targets, guided by the Regional Framework for Action, and related guidance and tools developed by WHO.
2. In the area of governance, a) including health-related SDGs and targets in national development policies, plans and strategies; b) setting national targets, endorsing and implementing multi-sectoral action plans; and c) discussing the current situation across government departments and civil society in order to identify gaps where technical support would be needed and engage the required stakeholders.
3. In the area of prevention a) fostering implementation of cost-effective interventions for the prevention and reduction of NCD risk factors; b) scaling up tobacco control measures (MPOWER) at the highest level and in a sustainable way; c) implementing the guidelines of Article 5.3 of the WHO Framework Convention for Tobacco Control, alongside the best buys to end tobacco industry influence; d) scaling up and taking proactive measures in the implementation of the regional action plan on reduction of salt, fat and sugar; e) enforcing implementation of the code of marketing for breast milk substitutes, and f) promoting physical activity through proven effective public health campaigns.
4. In the area of healthcare a) reorienting and strengthening health system to address NCDs, prioritizing cost-effective interventions, with a focus on strengthening NCD integration in primary healthcare (PHC), both in stable and emergency settings, and b) defining NCD service package to be integrated in PHC with adequate supplies of medicines, technologies and trained personnel.
5. In the area of surveillance a) strengthening NCD surveillance systems, focusing on the three pillars of surveillance: health outcomes, risk factors and national systems response; b) preparing for 3rd High-level Meeting of the UN General Assembly in 2018 by implementing monitoring systems to report on 10 progress indicators (using the latest NCD country capacity survey 2017); c) seeking to institutionalize the STEPs or an equivalent NCD risk factor survey (conduct a STEPs survey, if the last one was conducted prior to 2010), and d) institutionalizing NCD surveillance measures that can be conducted periodically.

In conclusion, good progress has been made in the EMR in important areas of NCD prevention and control. However, challenges remain and countries have to continue their efforts to meet expectations of the global and regional NCD agenda in 2018 and beyond. The WHO Eastern Mediterranean Regional Director’s Roadmap for 2017–21, prioritizing NCDs, may provide further guidance on that path.

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The integration and management of noncommunicable diseases in primary health care

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Citation: Slama S, Hammerich A, Mandil A, Sibai AM, Tuomilehto J, Wickramasinghe K, et al. The integration and management of noncommunicable diseases in primary health care. *East Mediterr Health J.* 2018;24(1):5–6. <https://doi.org/10.26719/2018.1.5>

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Noncommunicable diseases (NCDs) are a great burden in the Eastern Mediterranean Region (EMR) and, if no strategic intervention is taken, the burden is forecast to become even heavier, particularly with the additional impact of ageing populations. Currently, 62% of deaths in the EMR are due to NCDs (1). However, by 2030 this proportion is projected to increase to nearly 70% (2). The EMR is disproportionately affected by NCDs as a result of the Region's rapid urbanization and the globalization of unhealthy behaviours (3). Moreover, many of the EMR countries have health systems whose structures are not designed for the prevention, early detection and management of NCDs.

Indeed, the World Health Organization's (WHO) 2016 'Framework on integrated, people-centred health services' (4) emphasized the importance of organizing primary health care (PHC) around the comprehensive needs of people, rather than around a singular focus of specific diseases. When combined with population-wide preventative measures, people-centred PHC can prove very effective in tackling NCDs both at the population and individual level. The chronic nature and multiple comorbidities in people with NCDs are targeted by the core principles of people-centred PHC (5). The family practice model of people-centred care must be *continuous*, that is, the patient/client returns to the same health worker over time; the care should be *accountable*, with each health team responsible for a defined population; close-to-client care ensures *improved access* to PHC within the community; and care must be *coordinated*, with the PHC acting as the first point of entry and referring patients/clients to other levels of the health system where necessary. Such a model promotes improved prevention as well as the early detection and management of NCDs. It enables health workers to work closely with people with a high risk of developing NCDs and treat those with the early stages of a disease, thereby preventing the disease from advancing or developing complications. This is also an ideal environment for the implementation of cost-effective brief interventions such as WHO recommended 'Best Buys' (6). If required, PHC workers can then efficiently refer on patients/clients who require specialist care.

Thus, PHC represents the most appropriate and equitable framework for implementing individual health care interventions for NCDs (7). On a regional level, WHO Regional Office for the Eastern Mediterranean (EMRO) has also acknowledged the need for family practice to address NCDs and, beyond that, advance universal health coverage (UHC) (8,9). However, challenges to the integration of NCDs in PHC remain, not least due to the diversity among and within the EMR's 22 countries, due to various socio-economic and logistic reasons.

Despite the differences in health system performance and level of health expenditure, the service delivery of NCD-orientated PHC is a constraint common to each of the EMR's Member States. The Region's PHC systems have traditionally focused on communicable diseases, other acute conditions and maternal and child health. Primary health care was consequently arranged vertically and organized according to specific services. Patients/clients might be attending a different health professional each time they visit the clinic. This structure was incompatible with the need to develop a holistic appreciation of the PHC visitor, his or her health conditions and lifestyle throughout the life course. Therefore, a transition has begun away from the vertical, disease-specific approaches of the past and towards broader people-centred care.

Any effort to integrate NCDs in PHC must firstly identify the key interventions and cost-effective services that can be implemented. This led to the 2010 launch of the 'WHO Package of Essential Noncommunicable Disease Interventions for Primary Health Care' (WHO PEN) (10). The WHO PEN is composed of a prioritized set of measures that address the four major NCDs (cardiovascular diseases, cancer, diabetes, and chronic respiratory disorders) and their risk factors. Secondly, a means of ascertaining the capability of each country's PHC system and ways of improving this system are also required. In view of this, EMRO has developed the 'Framework on Strengthening the Integration and Management of Noncommunicable Diseases in Primary Health Care' (11). Adopting a health systems perspective, the Framework provides EMR countries with key action areas, tailored to NCDs, for each of the six building blocks (governance; financing; health workforce development;

service delivery; essential medicines and technologies; and health information) (12). Some recommended interventions, such as the need to support community-based training and self-care, are applicable to all countries. Other interventions target specific countries, depending on the challenges they face. For instance, countries in the midst of conflict require the development of a resilient PHC system. More developed countries may need to focus on health information systems, including electronic health records to link individuals' data across PHC and higher levels of care.

Early progress in integrating NCDs in PHC has focused on cardiovascular diseases (CVD). This is in large part because two of the WHO 'best buys' (6) and two of the nine global NCD voluntary targets (13) relate to CVD. As well as offering recommended interventions, the EMR Framework also allows a situational analysis of each country to be carried out, as in a 2016 review of the nationally adapted PEN initiative in the Islamic Republic of Iran (IraPEN). The Framework-based analysis identified short-, medium- and long-term health system reforms for the optimal integration of NCDs into PHC. When considering the challenges that lie ahead, it should be remembered that NCD integration in people-centered PHC cannot occur in isolation; instead it should be part of wider health sector reform that is a continuous process. This is the case for several EMR countries currently expanding their essential service delivery package, models of care and healthcare financing. Thus, integrated people-centred PHC services form a crucial component of strong health systems and are vital for moving closer to UHC, especially in the Eastern Mediterranean Region.

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Multiple tobacco use among young adult waterpipe smokers in Egypt

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Abstract

Background: The use of multiple tobacco products is an emerging trend. Studies on multiple use among waterpipe smokers are limited.

Objectives: We aimed to estimate the proportion of other tobacco products used by current adult waterpipe smokers in Egypt and identify the determinants of multiple tobacco product use.

Methods: Population-based surveys were conducted using interview questionnaires during 2015–2017 in urban Cairo and rural Menoufia. Participants aged 18 years and older were selected using purposive quota non-random sampling. The total sample included 2 014 participants. We analysed the data on 1 490 current waterpipe smokers. Variables recorded included: tobacco use, health beliefs, waterpipe smoking behaviour, sociodemographic characteristics, and perceived effectiveness of pictorial health warnings on waterpipe tobacco packs. Current waterpipe smokers were classified as waterpipe-only users and multiple tobacco product users.

Results: Almost half (47.9%) of the current waterpipe smokers used multiple tobacco products; 93.4% were dual users and 6.6% poly-users. The other tobacco products used were cigarettes (86.4%), electronic nicotine delivery systems (ENDS) (7.0%) or both (6.6%). Multiple users were more likely to be younger than waterpipe-only users. Young adult female waterpipe smokers used ENDS 12 times more than young adult males (48.8% versus 4.1% respectively). Non-daily waterpipe smoking, usually smoking at cafes, higher education and knowledge of pictorial health warnings were independent predictors of multiple tobacco product use.

Conclusion: Multiple tobacco product use was common among current waterpipe smokers in our study. Interventions to tackle non-cigarette and multiple tobacco use, especially in young adults, are urgently needed.

Keywords: waterpipe;tobacco; multiple use; young adults; e-cigarettes/ electronic nicotine delivery systems

Citation: Mostafa A, El Houssine M, Fotouh A. Multiple tobacco use among young adult waterpipe smokers in Egypt. *East Mediterr Health J.* 2018;24(1):7–17. <https://doi.org/10.26719/2018.24.1.17>

Received: 15/09/17; accepted: 21/11/17

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Introduction

Tobacco use is a risk factor of the main noncommunicable diseases that cause 80% of premature global mortality (1,2). Most of the world's smokers live in low- and middle-income countries, and 80% of the projected 8 million annual tobacco-related deaths by 2030 will occur in these countries (3). Therefore, tobacco control is one of the sustainable development goals for prevention and control of the noncommunicable diseases (4).

In the past few years, a trend in multiple or concurrent use of tobacco products has emerged (5–13). Growing evidence on the health hazards of the use of non-cigarette or other tobacco products has been reported (14–16). In Egypt, treatment of tobacco-related diseases costs US\$ 616 million annually, while 170 000 deaths attributable to tobacco occur each year (17). The use of multiple tobacco products may increase this health and economic burden, and prevent the achievement of the global target of a 30% relative reduction in tobacco use by 2025 (2).

The reported rates of multiple tobacco product use are high. A large national study in the United States of

America (USA) found that 40% of both adult and youth tobacco users used multiple tobacco products, mostly combining cigarettes and e-cigarettes (10). However, cigarette smoking is not always included in multiple tobacco use combinations (12). Waterpipe tobacco smoking, smokeless tobacco and electronic nicotine delivery systems (ENDS) are increasingly used worldwide (5,7,8,12,13,18,19), and have been promoted as less harmful alternatives to cigarettes (20,21). Young people who use multiple tobacco products are more prone to nicotine dependence and to continue using tobacco as adults (22). In the USA, about half of young current tobacco product users used 2 or more tobacco products (23). In the Eastern Mediterranean region, adolescents used other tobacco products (mainly waterpipe) more frequently than cigarettes (24). However, other tobacco products are not all regulated by national tobacco control laws (25).

Egypt has one of the highest rates of tobacco use in the Eastern Mediterranean region (26). Nearly half of Egyptian men currently smoke cigarettes or other tobacco products – most of them smoke daily – compared with 0.2% of women (27). Young adult males use tobacco in

similarly high proportion (40.5%) (27). Tobacco smoking is projected to increase to 62.9% among men in Egypt by 2025 (28). Also, young women in Egypt are using tobacco more, particularly non-cigarette tobacco products (29). In the 2005 and 2009 Global Youth and Global Adult Tobacco Surveys, Egyptian adolescent girls were 11 times more likely to smoke waterpipe tobacco than adult women and reported a higher prevalence of overall use of any tobacco product (3.8%) than older females (0.3%) (29). Studies determining the magnitude of multiple use of tobacco products among waterpipe smokers are limited. The aim of our study therefore was to estimate the proportion of other tobacco use among adult waterpipe smokers in Egypt, and to identify the factors associated with the use of multiple tobacco products.

Methods

Data for this study were collected as part of a larger study on the effectiveness of pictorial health warnings on waterpipe tobacco packs in encouraging cessation and preventing initiation of waterpipe tobacco smoking in Egypt.

Study design and sample

The larger study consisted of 2 cross-sectional, population-based surveys conducted in July–November 2015 and September 2016–January 2017. The target sample included 1 025 individuals in each survey period and consisted of male and female waterpipe smokers and nonsmokers aged 18 years and older from urban Cairo and a rural village in Menoufia governorate. Participants were selected using a purposive quota non-random sampling scheme. Trained field interviewers approached individuals at cafes, homes, workplaces and universities. Researches explained the purpose of the study before they screened individuals for age eligibility. Individuals who agreed to participate in the study provided their voluntary informed verbal consent to respond to a 25-minute face-to-face interview questionnaire. Participants were assigned an identification number for anonymity and to ensure confidentiality of their data. The total targeted sample in the 2 surveys of the parent study was 2 050 and the final sample included 2 014 participants (response rate 98.2%); of these, 1 490 (73.9%) were current waterpipe smokers.

Data collected

In this study, we analysed a subset of data from the larger study that focused on the current waterpipe smokers. Data included were respondents': tobacco use, sociodemographic characteristics, exposure to household second-hand smoke, health beliefs about waterpipe tobacco smoking, waterpipe smoking behaviour, and perceived effectiveness of pictorial health warnings on waterpipe tobacco packs.

For tobacco use, we considered 3 types of tobacco products: waterpipe, cigarettes, and electronic nicotine delivery systems (ENDS) – e-shisha or e-cigarettes. Respondents were defined as current smokers if they had

used any of the 3 tobacco products in the past 30 days (30); otherwise they were considered a nonsmoker (Figure 1). The main outcome studied was the sole use of waterpipe tobacco or the use of waterpipe tobacco in combination with other tobacco products. We defined a waterpipe-only user as a participant who currently smoked waterpipe tobacco only and did not concurrently use any other tobacco product. A multiple user was defined as a participant who currently smoked waterpipe tobacco as well as one or more other tobacco product – cigarettes or ENDS (dual user), or both (poly-user). The frequency of waterpipe tobacco smoking was measured as daily, weekly or monthly; cigarette smoking as daily or non-daily; and ENDS smoking as any use. Data on duration of use were available only for waterpipe tobacco smoking.

Sociodemographic data collected were: age, gender, residence (urban/rural), marital status, educational attainment and occupation. Data were also collected on participants' household exposure to second-hand smoke from cigarettes or waterpipe or both, and their beliefs about the effect of waterpipe tobacco smoking on health – whether they considered waterpipe smoking and the nicotine content of waterpipe tobacco were less, more, or equally hazardous compared with cigarette smoking and cigarette tobacco. To assess the waterpipe smoking behaviour of the participants, data were collected on: age at starting smoking waterpipes, preferred type of waterpipe tobacco (plain, flavoured), usual place to smoke waterpipes, average daily spending on waterpipe smoking, and previous attempts to stop smoking waterpipes. To evaluate the effectiveness of pictorial health warnings on waterpipe tobacco packs, data were collected on knowledge of pictorial health warnings on waterpipe tobacco packs, discussion of pictorial health warnings with others, and change induced in waterpipe smoking behaviour – e.g. smoked fewer *hagar* (portion of tobacco), had foregone a smoke, was more likely to consider quitting waterpipe smoking.

Statistical analysis

We described the sociodemographic characteristics of the participants and the proportions of tobacco users in the total sample ($n = 2\ 014$) and in the subset of 1 490 current waterpipe smokers. We categorized current waterpipe smokers into waterpipe-only users and multiple users and compared them according to sociodemographic characteristics using the chi-squared test for categorical variables. A P -value < 0.05 was considered statistically significant. The frequency of both waterpipe and cigarette smoking was further analysed as daily and non-daily use. Data on the frequency of ENDS use were insufficient; therefore the amount consumed was reported only for multiple users who were using both waterpipes and cigarettes.

Univariate analysis was used to identify variables associated with multiple tobacco product use among current waterpipe smokers. Variables that were statistically significantly associated with multiple use in the univariate analysis were included in a multivariable

logistic regression analysis. Adjusted odds ratios (OR_a) and 95% confidence intervals (CI) are reported. Variables included were gender, age, educational attainment, marital status, household exposure to second-hand smoke, frequency of waterpipe smoking, age at starting waterpipe smoking, place to smoke waterpipes, beliefs about the health effects of waterpipe smoking, knowledge of pictorial health warnings on waterpipe tobacco packs, discussion of pictorial health warnings with others, and effect of pictorial health warnings on participants' waterpipe smoking behaviour.

Data were analysed using the SPSS, version 22.

Ethical considerations

The study was approved by the Ethical Review Board of the Faculty of Medicine, Ain Shams University, Cairo, Egypt.

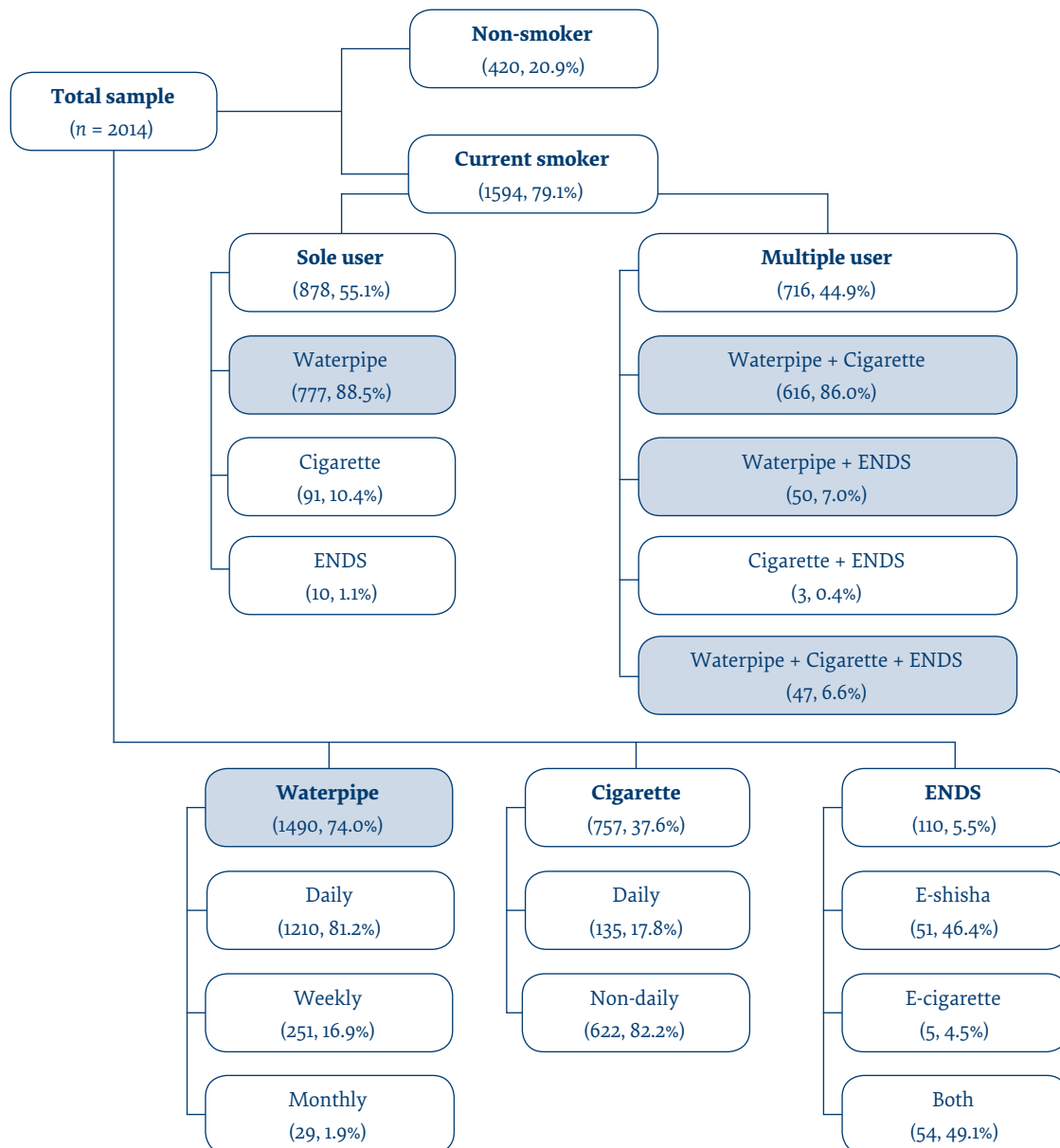
Results

Tobacco use in the total sample

More than three-quarters (79.1%) of our total sample (n = 2 014) currently used a tobacco product; waterpipe tobacco (74.0%), cigarettes (37.6%) or ENDS (5.5%) – as sole use (55.1%) or in combination with other tobacco products (44.9%) (Figure 1). As we intended to recruit an equal number of waterpipe smokers by age group, gender, and rural/urban residence, the distribution of waterpipe smokers in the total sample did not vary significantly between these demographic groups.

Cigarettes were significantly more likely to be used by younger adults (43.6% versus 34.1% by older adults, P < 0.001), males (38.5% versus 29.4% by females, P = 0.013), and those living in rural areas (43.1% versus 29.5% in urban areas, P < 0.001). Of the total smokers, female participants

Figure 1 Current tobacco use among study participants showing total, sole and multiple tobacco product use – waterpipes, cigarettes and electronic nicotine delivery systems (ENDS)



reported using ENDS 9 times more than males (27.8% versus 3.1% respectively, $P < 0.001$). Of the waterpipe smokers, females reported using ENDS 12 times more than males (40.3% versus 3.3% respectively, $P < 0.001$).

Tobacco use among current waterpipe smokers (n = 1 490)

Almost half ($n = 713$, 47.9%) of the 1 490 current waterpipe smokers were multiple tobacco product users. Of the multiple users, 666 (93.4%) were dual users; only 47 (6.6%) were poly-users. Cigarettes were the main tobacco product of the other tobacco products used by multiple users (616, 86.4%) while the rest of the multiple users smoked ENDS (50, 7.0%) or both cigarettes and ENDS (47, 6.6%) (Figure 1, blue shaded boxes).

Multiple users were significantly more likely to be younger than waterpipe-only users ($P < 0.001$). Among females, the use of multiple tobacco products was significantly more common than waterpipe-only use (60.4% versus 39.5% respectively) ($P = 0.003$) (Figure 2). Moreover, just over half of the younger adult females who smoked waterpipes reported using ENDS as the other tobacco product (51.2%), compared with 36.0% in the older female age group, and 4.1% and 2.9% respectively in their male counterparts.

Table 1 shows the demographic characteristics and household exposure to smoking of the total sample ($n = 2\ 014$) and current waterpipe smokers ($n = 1\ 490$) categorized as users of the waterpipe only and users of multiple tobacco products. Significantly more multiple users had secondary or higher education than waterpipe-only users, and were unmarried ($P < 0.001$). No statistically significant differences were found between waterpipe-only users and multiple users for occupation or rural/urban residence. More than two thirds (1 009/1 490, 67.7%) of all waterpipe smokers reported exposure to second-hand smoke at home. This exposure was significantly higher among multiple users than waterpipe-only users (71.2% versus 64.5% respectively, $P = 0.006$).

Waterpipe tobacco smoking behaviour and health beliefs

Table 2 shows the behaviour and health beliefs of waterpipe-only users compared with multiple tobacco product users. Significantly more waterpipe-only smokers were daily smokers, while more multiple users were non-daily waterpipe smokers ($P < 0.001$). Among multiple users, significantly more females were non-daily waterpipe smokers (70.5% versus 29.5% daily smokers) than males (19.5% versus 80.5% daily smokers) ($P < 0.001$).

Figure 2 Sole use of waterpipe tobacco and type of other tobacco product used among waterpipe smokers by gender and age-group (WTS: waterpipe tobacco smoking; ENDS: electronic nicotine delivery systems)

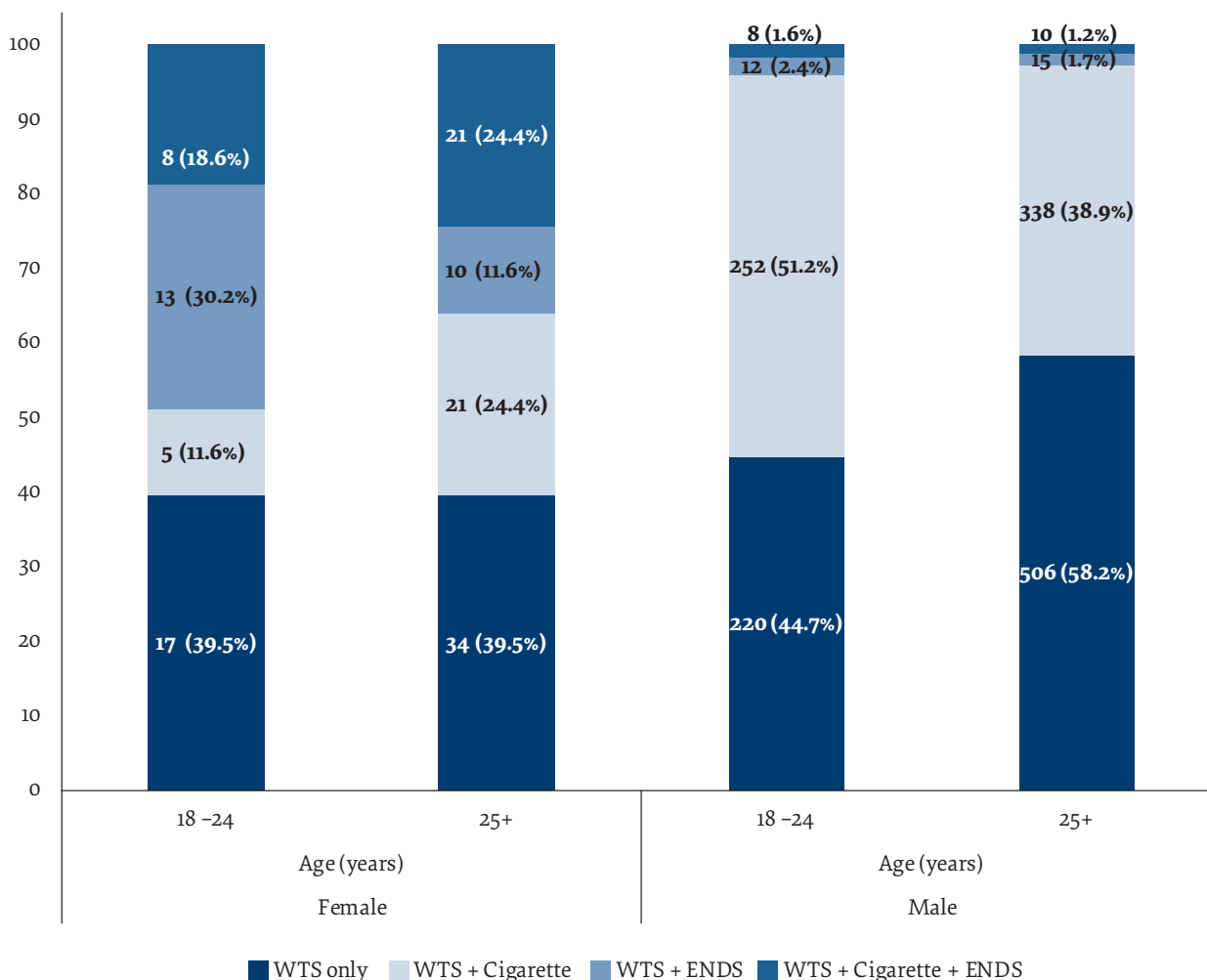


Table 1 Demographic characteristics and household exposure to smoking of the total sample (n = 2 014) and current waterpipe smokers (n = 1 490) with comparison between users of the waterpipe only and users of multiple tobacco products, Egypt, 2015–2017

Characteristic	Total sample (n = 2 014)	Current waterpipe smokers		P-value ^a
	No. (%)	Waterpipe-only user (n = 777)	Multiple tobacco product user (n = 713)	
Age group (years)				
18–24	743 (36.9)	237 (30.5)	298 (41.8)	< 0.001
25+	1271 (63.1)	540 (69.5)	415 (58.2)	
Gender				
Male	1820 (90.4)	726 (93.4)	635 (89.1)	0.003
Female	194 (9.6)	51 (6.6)	78 (10.9)	
Residence				
Rural	1194 (59.3)	442 (56.9)	441 (61.9)	0.051
Urban	820 (40.7)	335 (43.1)	272 (38.1)	
Education				
No schooling	90 (4.5)	53 (6.8)	22 (3.1)	
Primary	139 (6.9)	82 (10.6)	36 (5.0)	< 0.001
Preparatory	163 (8.1)	91 (11.7)	48 (6.7)	
Secondary	679 (33.7)	248 (31.9)	306 (42.9)	
Vocational/university	943 (46.8)	303 (39.0)	301 (42.2)	
Occupation^b				
Professional	314 (15.6)	95 (12.2)	94 (13.2)	
Technicians and associate professionals	203 (10.1)	69 (8.9)	65 (9.1)	0.928
Skilled	838 (41.6)	371 (47.7)	328 (46.0)	
Elementary occupations (e.g. porters, door keepers)	189 (9.4)	84 (10.8)	73 (10.2)	
Student/unemployed	470 (23.3)	158 (20.3)	153 (21.5)	
Marital status				
Unmarried	743 (36.9)	233 (30.0)	294 (41.2)	< 0.001
Married	1271 (63.1)	544 (70.0)	419 (58.8)	
Someone at home smokes				
Yes	1272 (63.2)	501 (64.5)	508 (71.2)	0.006
Waterpipe	212 (16.7)	92 (18.4)	68 (13.4)	0.151
Cigarettes	344 (27.0)	96 (19.1)	127 (25.0)	0.004
Both	716 (56.3)	313 (62.5)	313 (61.6)	0.172

^aComparison between users of the waterpipe only and users of multiple tobacco products.

^bAdapted from the International Standard Classification of Occupations (<http://www.ilo.org/public/english/bureau/stat/isco/isco08/index.htm>)

More multiple users started smoking waterpipes at an older age than waterpipe-only users ($P < 0.001$). More females started smoking waterpipes at 18 years or older compared with males (88.5% versus 53.5% respectively) ($P < 0.001$). Significantly more multiple users, especially young adults ($P = 0.018$) and females ($P < 0.001$), smoked waterpipes at cafes, while waterpipe-only users smoked at home and in cafes alike (Table 2). Females spent 4 times as much on waterpipe tobacco smoking than males – median daily spending = 16 EGP (interquartile range 10–30 EGP) for females compared with 4 EGP for males (interquartile range 3–10 EGP). Young adult females were significantly more likely to smoke flavoured waterpipe tobacco (76.7%) than older females (65.1%) and their male counterparts (12.4%) ($P < 0.001$ for both).

The majority of waterpipe-only and multiple users (60.4% and 65.1% respectively) believed that waterpipe smoking was bad for health but only about one-fifth of both waterpipe-only users (20.1%) and multiple users (19.1%) ever tried to quit (Table 2). These beliefs were significantly higher among young adult male waterpipe smokers ($P < 0.001$).

Significantly more multiple users were aware of the pictorial health warnings on waterpipe tobacco packs than waterpipe-only users ($P < 0.001$). This was highest among young adult males (80.4%). Among females, older adult waterpipe-only users were more aware of pictorial health warnings (35.3%) than younger females (29.4%) ($P = 0.019$). Of those who knew about pictorial warnings, more multiple users discussed them often compared with

waterpipe-only users ($P < 0.001$) (Table 2), especially older males. Among females, only older adult waterpipe-only users reported that they often discussed pictorial health warnings.

Among those who knew of the pictorial health warnings, multiple users were significantly more

likely than waterpipe-only users to have changed their waterpipe tobacco smoking habit (reduced the number of *hagar* smoked, $P = 0.025$; foregone a smoke, $P < 0.001$; and considered quitting waterpipe smoking, $P = 0.006$) because of the warnings (Table 2). This change was more common in males (48.5% versus 10.1% of females,

Table 2 Behaviour and health beliefs of waterpipe-only users compared with multiple tobacco product users, Egypt, 2015–2017

Variable	Waterpipe-only user (n = 777)	Multiple tobacco product user (n = 713)	P-value
	No. (%)	No. (%)	
Smokes waterpipe			
Monthly	16 (2.1)	13 (1.8)	
Weekly	85 (10.9)	166 (23.3)	< 0.001
Daily	676 (87.0)	534 (74.9)	
Age when started waterpipe smoking (years)			
11–17	419 (53.9)	304 (42.6)	< 0.001
18+	358 (46.1)	409 (57.4)	
Place where usually smoke waterpipe			
Cafe/restaurant	309 (39.8)	384 (53.9)	
Home	319 (41.1)	155 (21.7)	< 0.001
Other	149 (19.2)	174 (24.4)	
Type of waterpipe tobacco smoked			
Plain	622 (80.1)	555 (77.8)	
Flavoured	135 (17.4)	126 (17.7)	0.125
Both	20 (2.6)	32 (4.5)	
Believes effects of smoking waterpipe tobacco on health are:			
Good	124 (16.0)	53 (7.4)	
Neither good nor bad	146 (18.8)	165 (23.1)	< 0.001
Bad	469 (60.4)	464 (65.1)	
Don't know	38 (4.9)	31 (4.3)	
Believes the harmful effects of smoking waterpipe tobacco compared to smoking cigarettes are:			
Fewer	128 (16.5)	115 (16.1)	
The same	184 (23.7)	145 (20.3)	0.021
More	403 (51.9)	417 (58.5)	
Don't know	62 (8.0)	36 (5.0)	
Believes the nicotine content of waterpipe tobacco compared to cigarette tobacco is:			
Lower	135 (17.4)	99 (13.9)	
The same	122 (15.7)	123 (17.3)	< 0.001
Higher	273 (35.1)	342 (48.0)	
Don't know	247 (31.8)	149 (20.9)	
Ever tried to quit, yes	156 (20.1)	134 (18.9)	0.551
Aware of pictorial health warnings on waterpipe tobacco packs, yes	471 (60.6)	503 (70.5)	< 0.001
Discussed pictorial health warnings on waterpipe tobacco packs with others, often^a	130/459 (28.3)	189/492 (38.4)	0.001
Pictorial health warnings on waterpipe tobacco packs changed waterpipe smoking habit^a	(n = 459)	(n = 492)	
Reduced <i>hagar</i>	276 (60.1)	337 (68.5)	0.025
Forgone a smoke	164 (35.7)	237 (48.2)	< 0.001
More likely to consider quitting	244 (53.2)	312 (63.4)	0.006

^aThese questions were answered only by those who responded "yes" to "Aware of pictorial health warnings on waterpipe tobacco packs"; a few responses were missing.

$P < 0.001$) and young adults (51.4% versus 41.7% of older adults, $P < 0.001$).

Predictors of multiple tobacco product use

The results of the univariate and multiple logistic regression analyses are shown in Table 3. Of the variables found significantly associated with multiple use among current waterpipe smokers in the univariate analysis, the following remained statistically significant in the logistic regression analysis: non-daily waterpipe smoking ($OR_a = 1.5$, 95% CI: 1.09–2.07), cafes being the usual place of smoking ($OR_a = 1.87$, 95% CI: 1.43–2.44), higher educational attainment (high school/university education) ($OR_a = 1.81$, 95% CI: 1.34–2.43), and knowledge of pictorial health warnings on waterpipe tobacco packs ($OR_a = 2.29$, 95% CI: 1.65–3.17).

Often discussing pictorial health warnings on waterpipe tobacco packs with others and considering changing waterpipe smoking habit because of the pictorial health warnings were highly correlated with knowledge of pictorial health warnings and so were removed from the analysis. A confounding effect of age and gender in relation to age at starting waterpipe smoking, marital status and educational level was observed; there were more females than males in the categories higher educational attainment, unmarried and late start of waterpipe smoking.

Discussion

Multiple tobacco product use was common among current waterpipe smokers in our participants. Almost half of them were either dual users or poly-users. These findings concur with the recent evidence from both high- and low/middle-income countries (5,6,13) that multiple tobacco product use is increasing, reaching up to 40% or

more among both adult and youth current tobacco users (8–11,23).

However, the estimates reported for multiple use among current tobacco users vary widely (0.5%–66.2%) depending on the type of tobacco (smoked or smokeless) studied (5,7,12,19). The term “multiple tobacco product use” has only recently been used in the literature and has appeared mainly in studies done in the USA (6,9,11,31). “Poly-use”, “dual use”, “other tobacco products”, “non-cigarette tobacco” and “alternative tobacco products” are terms that have been more often reported to indicate the use of more than one tobacco product. However, these terms have different definitions (32).

Notably, we found that young adult females used multiple tobacco products more often than males, which differs from the reported gender profile of multiple users from other countries (9,11). However, results from previous studies indicate a change in social and cultural smoking norms among women in Egypt, as use of both cigarettes and other tobacco products is increasing, especially among adolescents (29). Not only is the difference in smoking between youth and adult females closing (29), but the gender gap for waterpipe tobacco smoking is also narrowing, a finding reported in other countries in the region as well (33). Consistent with previous reports, the other tobacco product used by current waterpipe smokers in our study was mostly cigarettes (10,19). ENDS use was more common among young adult female waterpipe smokers in our study. Similarly, e-cigarettes were commonly used by multiple users in other studies (6,8,12,13). The use of non-cigarette products among cigarette smokers is thought to be an attempt to quit (20–22) but there are concerns that they may serve as an entry to cigarette use in young people (34). However, we did not examine the order in which

Table 3 Univariate and multivariable logistic regression analyses of factors associated with multiple tobacco product use among waterpipe smokers in Egypt, 2015–2017

Variable	Univariate analysis		Multivariable logistic regression analysis			
	OR (95% CI)	P-value	β	SE	OR_a (95% CI)	P-value
Female gender	1.75 (1.21–2.53)	0.003	0.383	0.230	1.47 (0.94–2.3)	0.095
Younger age	1.64 (1.32–2.03)	< 0.001	0.317	0.169	1.37 (0.99–1.91)	0.061
Higher education attainment	2.35 (1.82–3.04)	< 0.001	0.592	0.151	1.81 (1.34–2.43)	< 0.001
Unmarried	1.64 (1.32–2.03)	< 0.001	-0.113	0.174	0.89 (0.64–1.26)	0.518
Exposed to second-hand smoke at home	1.37 (1.09–1.69)	0.005	0.082	0.139	1.09 (0.83–1.43)	0.554
Non-daily waterpipe smoker	2.24 (1.71–2.94)	< 0.001	0.408	0.163	1.5 (1.09–2.07)	0.012
Older age at starting to smoke waterpipes	1.58 (1.28–1.93)	< 0.001	0.220	0.117	1.25 (0.99–1.57)	0.060
Usually smokes waterpipes in cafes	1.77 (1.44–2.17)	< 0.001	0.626	0.136	1.87 (1.43–2.44)	< 0.001
Believes waterpipe smoking is more harmful than cigarette smoking	1.31 (1.07–1.61)	0.010	0.030	0.144	1.03 (0.78–1.37)	0.833
Knows of health warning on waterpipe tobacco packs	1.57 (1.25–1.93)	< 0.001	0.827	0.167	2.29 (1.65–3.17)	< 0.001

OR = odds ratio; CI = confidence interval; SE = standard error; OR_a = adjusted odds ratio.

tobacco type was started. Other combinations of multiple use have been observed in the Eastern Mediterranean region (e.g. waterpipe and smokeless) (16) but we did not ask about smokeless use in our study as rates in Egypt for adult smokeless use are low, around 1% (26,35).

Unique to our study, we asked participants about their awareness of the existing waterpipe tobacco health warnings. Interestingly, we found that knowledge of waterpipe tobacco health warnings was a significant independent predictor of multiple use, and highly correlated with a positive change in the waterpipe smoking habits of participants (reduction in the number of *hagar* smoked, foregoing a smoke, being more likely to consider quitting). Multiple users in this case may have shifted to other tobacco products in an attempt to quit or because they were under the impression that they were smoking a “lighter” form of tobacco (20–22). We also found that the use of flavoured tobacco did not predict multiple use, as also reported in a US study (11).

Higher educational attainment was also a significant determinant of multiple use in our study. This could be partly explained by the large number of women in the higher educational categories in our participants, thus the link with increased rates of multiple use in this group. This finding is consistent with a previous study in Egypt that found a higher level of cigarette smoking among female participants with a university or higher educational level (29). The authors attributed this to targeted marketing strategies that aim to associate smoking with a liberated identity among female consumers in this group (29).

Another determinant of multiple use was smoking usually at cafes, which was also observed in another study that reported multiple tobacco use in 40% of bar patrons (9). Multiple users may not be as addicted to waterpipe tobacco smoke as waterpipe-only users, who have a device at home and smoked equally at home or at a cafe. Nonetheless, non-daily waterpipe smoking in our study was a predictor of multiple use, which concurs with a previous study that reported that dual waterpipe and cigarette smokers had fewer waterpipe sessions per week (19).

To maintain a continuous demand for their products, the tobacco industry targets potential new users and vulnerable groups, such as youth and women, with constantly evolving tobacco forms (26). The industry persuades smokers who intend to quit to select products

promoted as being of lower risk (20–22) and possible to use in smoke-free environments (11,26). These illusions encourage the use of multiple tobacco products and ignore the evidence of the associated risks (22,30). Wide-ranging tobacco-free strategies are needed to counter these tactics of the tobacco industry.

Our study had some limitations. It was based on a non-random sample which focused on waterpipe smokers, therefore the proportions for multiple tobacco product use in this subset may not represent the Egyptian population of smokers. Tobacco use was based on self-reporting and we did not ask respondents on the frequency or time of starting to use other tobacco products. In addition, because of the cross-sectional nature of the study design, we could not determine whether multiple tobacco product use among our participants was an attempt to quit or identify if there was a shift from one product to another.

Conclusions

Almost half of the current waterpipe smoker participants used multiple tobacco products. Multiple users were more likely to be younger than waterpipe-only users. Young adult female waterpipe smokers used ENDS significantly more than males. Non-daily waterpipe tobacco smoking, cafes being the usual place of smoking, higher educational attainment and knowledge of the pictorial health warnings on waterpipe tobacco packs were independent predictors of multiple tobacco product use. Our findings are exploratory and may be a basis for future investigations into the rate and frequency of this emerging behaviour. Studies that include possible tobacco product combinations are warranted to guide the expansion of policies to regulate non-cigarette products. Novel warnings and tailored interventions for young adults, especially females, are necessary to curb the simultaneous use of different tobacco products.

Acknowledgements

The authors are grateful to the participants of this study. We also thank our field team and field supervisor Mr Raafat Gamal, data interviewers, data managers and data entry personnel for their dedication and adherence to quality during data collection.

Funding: The study was funded by the International Development Research Center through the Tobacco Control Research Group of the American University of Beirut to study waterpipe tobacco smoking prevention and intervention programmes in the region as a part of the project “Shaping Research for Health in the Arab World: a Systems and Network Approach to Advance Knowledge, Inform Policy, and Promote Public Health” (Award 102518).

Competing interests: None declared.

Consommation de différents produits du tabac chez les jeunes adultes fumeurs de pipe à eau en Égypte

Résumé

Contexte : La consommation de différents produits du tabac constitue une tendance émergente. Les études sur la consommation de différents produits du tabac parmi les fumeurs de pipe à eau sont en nombre limité.

Objectifs : La présente étude avait pour objectif d'évaluer la proportion des autres produits du tabac utilisés par les fumeurs adultes de pipe à eau en Égypte, ainsi que d'identifier les déterminants de la consommation de différents produits du tabac.

Méthodes : Des études populationnelles ont été conduites à l'aide de questionnaires d'entretien entre 2015 et 2017 dans le Caire urbain et dans la zone rurale de Menoufia. Les participants âgés de 18 ans ou plus étaient sélectionnés sur la base d'un échantillonnage dirigé non aléatoire par quotas. L'échantillon total incluait 2014 participants. Nous avons analysé les données de 1490 fumeurs de pipe à eau. Les variables enregistrées étaient le tabagisme, les croyances en matière de santé, les comportements en matière de consommation de tabac par pipe à eau, les caractéristiques socio-démographiques, et l'efficacité perçue des mises en garde sanitaires illustrées sur les paquets de tabac pour pipe à eau. Les fumeurs de pipe à eau ont été classés en deux catégories : les fumeurs de pipe à eau exclusifs et les fumeurs consommant différents produits du tabac.

Résultats : Près de la moitié (44,9 %) des fumeurs de pipe à eau consommaient différents produits du tabac ; 93,4 % étaient des consommateurs doubles et 6,6 % des polyconsommateurs. Les autres produits du tabac utilisés étaient les cigarettes (86,4 %), les inhalateurs électroniques de nicotine (7,0 %) ou les deux ensemble (6,6 %). Les consommateurs de différents produits du tabac étaient davantage susceptibles d'être plus jeunes que les consommateurs de pipe à eau exclusifs. Les jeunes femmes adultes consommatrices de tabac par pipe à eau utilisaient 12 fois plus les inhalateurs électroniques de nicotine que les jeunes hommes adultes (48,8 % contre 4,1% respectivement). La consommation non quotidienne de tabac par pipe à eau, ayant lieu le plus souvent dans des cafés, un niveau d'éducation supérieur et la connaissance des mises en garde sanitaires illustrées constituaient des facteurs prédictifs indépendants de la consommation de différents produits du tabac.

Conclusion : Selon notre étude, le consommateur de différents produits du tabac était courante parmi les fumeurs de tabac par pipe à eau. Des interventions visant à s'attaquer au problème de la consommation de tabac autre que les cigarettes et de la consommation de différents produits du tabac, notamment chez les jeunes adultes, sont requises de toute urgence.

تعاطي منتجات متعددة من التبغ في صفوف مدخني الشيشة الشباب في مصر

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الخلاصة

الخلفية: ثمة اتجاه متزايد لتعاطي منتجات متعددة من التبغ. ولا يوجد سوى عدد محدود من الدراسات المتعلقة بتعاطي منتجات متعددة في صفوف مدخني الشيشة.

الأهداف: هدفنا في هذه الدراسة إلى تقسيم نسبة منتجات التبغ الأخرى التي يتعاطها مدخنو الشيشة البالغون الحاليون في مصر والوقوف على محددات تعاطي منتجات متعددة من التبغ.

طرق البحث: تم إجراء مسح سكانية باستخدام استبيانات قائمة على مقابلات خلال الفترة 2015-2017 في مدينة القاهرة وريف محافظة المنوفية. وتم اختيار المشاركين في الفئة العمرية أو 18 عاماً وأكثر باستخدام أسلوب العينات غير العشوائية الحصصية العمدية. وبلغ مجموع المشاركين في العينة 2014 مشاركا. وعمدنا إلى تحليل بيانات عن 1490 مدخنا من المدخنين الحاليين للشيشة. وتضمنت المتغيرات المسجلة ما يلي: تعاطي التبغ، والمعتقدات الصحية، وسلوك تدخين الشيشة، والسمات الاجتماعية-السكانية، والفعالية المتصورة للتحذيرات الصحية المصوّرة على علب معسل الشيشة. وتم تصنيف مدخني الشيشة الحاليين إلى مدخني شيشة فقط ومدخني منتجات تبغ متعددة.

النتائج: تبين أن نحو نصف المدخنين الحاليين للشيشة (9, 47%) يتعاطون منتجات تبغ متعددة؛ حيث يتعاطى 4, 93% منهم منتجاتين اثنين ويتعاطى 6, 6% منتجات متعددة. وتضمنت منتجات التبغ الأخرى السجائر (4, 86%) وأنظمة النيكوتين الإلكترونية (7%) أو كليهما (6, 6%). وتبين أن متعاطي منتجات التبغ المتعددة هم على الأرجح أصغر سناً من مدخني الشيشة فقط. كما تبين أن مدخّات الشيشة الشباب تستخدم أنظمة النيكوتين الإلكترونية أكثر من نظرائهن الشبان بواقع 12 مرة (8, 48% مقابل 1, 4% على التوالي). وعُدّ تدخين الشيشة على أساس غير يومي - في المقاهي عادةً - وارتفاع مستوى التعليم، والمعرفة بالتحذيرات الصحية المصوّرة، مُنبئات مستقلة لتعاطي منتجات تبغ متعددة.

الاستنتاج: توصلت الدراسة إلى أن تعاطي منتجات التبغ المتعددة منتشر في صفوف مدخني الشيشة الحاليين المدرجين في دراستنا. وثمة حاجة ملحة لإجراء تدخلات بهدف التصدي لتعاطي منتجات التبغ من غير السجائر ومنتجات التبغ المتعددة، لا سيما في صفوف الشباب.

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Assessment of salt concentration in bread commonly consumed in the Eastern Mediterranean Region

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Abstract

Background: Hypertension is the most important cardiovascular risk factor in the World Health Organization (WHO) Eastern Mediterranean Region. Excessive salt and sodium intake is directly related to hypertension, and its reduction is a priority of WHO. Bread is the leading staple food in the Region; therefore, reducing the amount of salt added to bread could be an effective measure for reducing salt intake.

Aim: The study sought to determine the levels of sodium and salt in locally produced staple bread from 8 countries in the Region.

Methods: Bread samples were collected randomly from bakeries located in the capital cities of the selected countries. The samples were analysed for sodium content using atomic absorption spectroscopy.

Results: The mean salt content of breads varied from 4.28 g/kg in Jordan to 12.41 g/kg in Tunisia. The mean salt and sodium content in bread for all countries was 7.63 (SD 3.12) and 3.0 (SD 1.23) g/kg, respectively. The contribution of bread to daily salt intake varied considerably between countries, ranging from 1.3 g (12.5%) in Jordan to 3.7 g (33.5%) in Tunisia.

Conclusion: Interventions to reduce population salt intake should target reduction of salt in bread in all countries. The amount of salt added to bread should be standardized and relevant legislation developed to guide bakers. Setting an upper limit for salt content in flat bread (pita or Arabic bread) at 0.5% is strongly recommended. However, salt levels at $\leq 1\%$ would be appropriate for other kind of breads.

Keywords: Salt, sodium, bread, noncommunicable disease, Eastern Mediterranean Region

Citation: Al Jawaldeh A, Al-Khamaiseh M. Assessment of salt concentration in bread commonly consumed in the Eastern Mediterranean Region. *East Mediterr Health J.* 2018;24(1):18–24. <https://doi.org/10.26719/2018.24.1.18>

Received: 10/07/17; accepted: 05/02/18

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Introduction

The average salt intake of > 12 g/day per person in the World Health Organization (WHO) Eastern Mediterranean Region is higher than in most other regions in the world (1). In fact, it is more than double the amount recommended by WHO of < 5 g/day or 2 g/day of sodium for adults. For children the recommendation is lower and depends on their calorie intake (2). Salt is the main source of sodium intake in the diet, accounting for almost 100% of daily sodium intake, with the majority ($> 85\%$) being excreted by the kidneys (3). Sodium is essential for maintenance of plasma volume, acid–base balance, transmission of nerve impulses and normal cell function. However, in excess it causes body fluid imbalance and presents a challenge for excretion by the kidneys, which potentially affects blood pressure and increases the risk of noncommunicable diseases (NCDs) (4). There is a significant positive correlation between high dietary sodium intake and increase in blood pressure in adults and children, and clinical trials have demonstrated that lowering sodium intake reduces blood pressure among individuals with normal as well as high blood pressure (5). High blood pressure is a predisposing factor for cardiovascular diseases and a number of other

noncommunicable diseases (NCDs) (6). NCDs are the leading cause of death in the Region; 2.2 million lives are lost to NCDs annually, of which 51% are premature and occur among people aged < 70 years (6). The burden of NCDs is progressively increasing. Projections indicate that there will be an alarming increase in their prevalence, with the 4 main NCDs causing 2.4 million deaths in 2025, unless serious action is taken (7). This scenario represents the second highest projected increase among the 6 WHO Regions (7). The growing burden of NCDs in the Eastern Mediterranean Region calls for urgent public health action to tackle unhealthy diet (1 of the 4 key risk factors), including implementation of policies to reduce levels of salt in foods.

There is evidence that salt reduction is a high-impact, preventive intervention that can considerably reduce the burden of NCD-related morbidity and mortality (6). A reduction in dietary intake of sodium of 50 mmol/day could reduce the number of people needing antihypertensive therapy by 50%, the number of deaths from strokes by 22% and the number of deaths from coronary heart disease by 16% (8). Studies conducted in the United States of America (USA) indicated that a 3 g reduction in daily salt intake was associated with a

significant decrease in the annual incidence of coronary heart disease, stroke, myocardial infarction, and all-cause mortality, which resulted in an estimated decrease in annual healthcare costs of US\$10–24 billion (9). Other studies have shown that decreasing sodium intake to < 2.3 g/day improved conduit artery and resistance vessel endothelial function, improved bioavailability of NO and reduced oxidative stress in middle aged and older adults with elevated systolic blood pressure (10). On the basis of this and other evidence the need to reduce salt in food was recognized by the United Nations General Assembly at a high-level meeting on NCDs in 2011 (11). A 30% relative reduction in mean population salt intake by 2025 was enshrined as one of the voluntary global NCD targets set out in the *Global Action Plan for the Prevention and Control of NCDs*, endorsed by the World Health Assembly in 2013 (12,13).

Entrenched within an overall dietary pattern, sodium intake may come from salt added to cooking or at the table, which is under an individual's control, but also comes from salt in processed or prepared foods (14). In some countries the major source of dietary sodium is salt added during food preparation, whereas in other countries, processed food products contribute most of the salt in the diet. In the United Kingdom of Great Britain and Northern Ireland (UK) and USA processed foods contribute > 70% of the dietary salt intake, whereas in China, 76% of total salt intake is discretionary (15). Similarly, sources of dietary salt in the Eastern Mediterranean Region vary between low-, middle- and high-income countries due to varying dietary patterns (2). The nutrition transition in the Region has resulted in diets dominated by processed products such as bread, crackers, processed meats, cheese and snack foods and these contribute considerably to the high salt consumption in the Region (1). Observational studies have indicated that bread is the leading staple food in the Region; therefore, reducing the amount of salt added to bread could be an effective measure for the prevention and control of NCDs.

There is a lack of information on the salt content of bread in the Region. Therefore, we conducted an indicative study to measure the salt content in bread from different countries in the Region, so that policy-makers can decide on the appropriate action to achieve salt reduction and whether bread is a priority for such action in the Member States.

Methods

Sample size

The initial plan was to collect 10 samples of staple bread. This is defined as bread that is eaten routinely and in such quantities that it constitutes a dominant portion of the standard diet for a given population, supplying a large fraction of energy needs. We sent a message to all WHO and Ministry of Health focal points in each Member State. One hundred and five bread samples were collected randomly during 1 November to 15 December 2013, which responded to the study, namely Bahrain, Egypt, Jordan,

Kuwait, Qatar, Oman, Lebanon and Tunisia. Bread samples were collected from different bakeries in the capital city of each country; one sample from each bakery. Bread samples were packed in airtight plastic bags, stored under cool, dry conditions and transported to the Royal Scientific Society, Jordan by courier for analysis. Each sample weighed ≥ 150 g. The original samples were all flat bread, which is the most popular form in the Middle East, which is also called Khubz Arabi and is now widely known as pita bread. This applied to all countries involved in the study, except Tunisia, where round, thick French-type bread was dominant.

Sample preparation

The bread samples were ground to form a homogeneous composition, packed and stored in airtight plastic bags at 15°C until use. The samples were analysed for sodium content and the results were used to estimate the population sodium intake resulting from bread consumption in the selected countries.

Determination of sodium and moisture content

The sodium and moisture contents of bread were determined using Association of Official Analytical Chemists (AOAC) methods. Moisture content was determined by drying samples in an oven at 105°C to eliminate all moisture in the sample. Analysis of sodium was carried out with the atomic absorption technique after digestion of samples with nitric acid. For this purpose, 5–10 g bread samples were weighed accurately and transferred to the digestion flask and 25 ml nitric acid was added. The digestion flasks were placed on a sand bath at 200°C for 1 hour until the whole organic matter was completely digested. The digested material was transferred to a 100-ml volumetric flask and the volume made up to the mark with deionized water. The samples were analysed for sodium content using atomic absorption and calculated on a dry weight basis. Standard solutions for sodium were prepared and the wavelength readings used to construct a calibration curve. Sodium was read off at 589 nm and sodium content calculated as described below.

For calculation of sodium content on a dry weight basis the following formula was used:

$$\text{Sodium on dry weight basis} = \frac{\text{Sodium content on wet basis (Na)}}{100 - \text{Moisture content}} \times 100$$

For calculation of salt content in the sample, the following formula was used:

$$\text{Salt content (NaCl)} = \frac{\text{Sodium content (Na)} \times \text{Molecular weight of NaCl}}{\text{Atomic weight of Na}}$$

Standard deviations for the mean values between the countries were calculated.

Results

The mean levels of salt and sodium in bread samples collected from the 8 countries were 7.63 (standard deviation 3.12) g/kg and 3.0 (1.23) g/kg, respectively (Table 1). The highest salt content was found in Tunisia and Kuwait and the lowest in Egypt and Jordan. The standard deviation shows that there was considerable variation of salt content among the countries. The contribution of bread to daily salt intakes varied considerably among the countries, ranging from 1.3 g (12.5%) in Jordan to 3.7 g (33.5%) in Tunisia, based on a 300 g daily bread intake in most countries of the Region.

Discussion

WHO recommends salt reduction in food as one of the cost-effective interventions to control and prevent NCDs. The present study revealed that levels of salt varied within the same type of bread. For example, the level was high in Kuwait 10.97 g/kg (1.1%), while Jordan produced the same flat bread at a level of 4.28 g/kg (0.43%), which means that Kuwait could reduce the salt content in bread without any concern related to the palatability or physical properties of the bread. This also applies to Bahrain and Oman. The highest level of salt was found in the French-type rounded thick bread produced in Tunisia 12.41 g/kg (1.24%), which contributed to 3.2 g of salt intake daily. This represents 64% of the recommended salt intake level set by WHO (< 5 g/day/person).

Although the level of salt in flat bread produced in the Eastern Mediterranean Region is not as high as in

European bread (1.5–3%) (16), it still represents a major source of salt intake considering that bread is a staple food in the Region and consumed in high quantities by most of the population. Therefore, salt reduction in bread could contribute to reduction of salt intake in the Region. The WHO Regional Office for the Eastern Mediterranean set a target for 30% reduction in salt content as a strategic intervention in the next 3 years.

Technical limitations are rarely a reason to drop bread from a salt reduction programme. Within almost every food category, there is already a broad range of salt levels across similar products that demonstrate the technical feasibility of producing lower salt options. For example, rapid assessment shows that flat bread can be produced with salt levels as low as 0.4% on wet basis, as in Jordan and Egypt. Setting a target for salt content in bread of up to 0.5% (5.0 g/kg bread) is technically possible.

Encouraging the food industry to reformulate its products can be challenging. Several arguments may be used by the industry to justify the difficulty of reducing salt content in some foods, including bread. However, experience from around the world has shown that it is technically possible to reduce the amount of salt significantly without affecting the product. In the UK, for example, the salt content of processed foods sold in supermarkets was initially reduced by 20–30% over 3 years without affecting consumer preference or sales (17). In the UK it was estimated that, for a total campaign cost of £15 million to reduce daily salt intake, £1.5 billion per year would be saved in health care (1). The present study showed that average salt content in Tunisia and Kuwait is > 1% in bread, which accounts for 33.5 and 33.9% of total salt intake, respectively (Table 1). Similar findings have been reported in the Islamic Republic of Iran and

Table 1. Content of sodium and salt in samples of bread mostly consumed in selected countries of the Eastern Mediterranean Region (on wet basis)

Country	Type of bread	No. of Samples	Sodium content in wet basis (ppm)	Sodium content in wet basis (g/kg)	Solt content in wet basis (g/100 g)	Salt content in g/kg	Estimated daily intake of salt from bread (300g/d/person)	Estimated daily* salt intake g/d/person	Percentage of bread contribution to tototal salt intake (g/d/person)
Bahrain	Sliced bread (French type)	5	2631.9	2.6	0.67	6.69	2.0	—	—
	Arabic bread (pita)	5	2634.9	2.6	0.67	6.70	2.0	—	—
	Flat bread (Lebanese)	10	5260.7	5.3	1.34	13.37	4.0	—	—
	Mean		3509.2	3.5	0.89	8.92	2.7	13.5	19.8
Oman	White sliced bread (French type)	5	3662.2	3.7	0.93	9.31	2.8	—	—
	Samoon bread	4	4701.9	4.7	1.20	11.95	3.6	—	—
	Flat Arabic bread (Lebanese)	6	2312.5	2.3	0.59	5.88	1.8	—	—
	Mean		3558.9	3.6	0.91	9.05	2.7	9.5	28.6

Table 1. Content of sodium and salt in samples of bread mostly consumed in selected countries of the Eastern Mediterranean Region (on wet basis) (concluded)

Country	Type of bread	No. of Samples	Sodium content in wet basis (ppm)	Sodium content in wet basis (g/kg)	Solt content in wet basis (g/100 g)	Salt content in g/kg	Estimated daily intake of salt from bread (300g/d/person)	Estimated daily* salt intake g/d/person	Percentage of bread contribution to total salt intake (g/d/person)
Egypt	Baladi refined bread (Ayash)	5	1582.5	1.6	0.40	4.02	1.2	—	—
	Baladi ordinary (Ayash)	5	2010.1	2.0	0.51	5.11	1.5	—	—
	Mean		1796.3	1.8	0.46	4.57	1.4	9.2	14.9
Kuwait	Flat Arabic thin bread (brown)	3	3319.4	3.3	0.84	8.44	2.5	—	—
	Flat thin Arabic bread (white)	4	3330.6	3.3	0.85	8.47	2.5	—	—
	Flat Arabic bread (white)	4	6087.5	6.1	1.55	15.48	4.6	—	—
	Flat Arabic bread (brown)	2	4516.5	4.5	1.15	11.48	3.4	—	—
	Mean		4313.5	4.3	1.10	10.97	3.3	9.7	33.9
Tunisia	French bread	10	4881.7	4.9	1.24	12.41	3.7	—	—
	Mean		4881.7	4.9	1.24	12.41	3.7	11.1	33.5
Qatar	Arabic bread small (pita)	5	2714.1	2.7	0.69	6.90	2.1	—	—
	Arabic bread big (pita)	5	1677.3	1.7	0.43	4.26	1.3	—	—
	Arabic bread brown (pita)	5	1790.0	1.8	0.46	4.55	1.4	—	—
	Lebanese bread (white)	5	1680.0	1.7	0.43	4.27	1.3	—	—
	Lebanese bread (brown)	5	2468.3	2.5	0.63	6.27	1.9	—	—
	Mean		2065.9	2.1	0.53	5.25	1.6	10.5	15.0
Jordan	White bread small (Lebanese)	4	1114.6	1.1	0.28	2.83	0.8	—	—
	White bread large (Lebanese)	8	2256.3	2.3	0.58	5.74	1.7	—	—
	Mean		1685.5	1.7	0.43	4.28	1.3	10.3	12.5
Lebanon	Arabic white bread (Lebanese)	10	2190	2.2	0.56	5.57	1.7	—	—
	Mean		2190	2.2	0.56	5.57	1.7	8	20.9
Mean for all countries			3000.1	3.0	0.76	7.63	2.3	10	22.9
Standard deviation					1.23		3.12		

Morocco. Bread is thus a point of focus for salt reduction, with several bakeries already taking action, for example, in the Islamic Republic of Iran, Jordan, Oman, United Arab Emirates (UAE), Morocco, Bahrain, Kuwait and Qatar (1,18,19).

Many Member States in the Region are currently taking active steps based on the policy guidance and recommended actions for salt reduction. Kuwait is gradually reducing the salt content of bread through its public bread supplier, which is the main supplier of bread

in the market. In 2013, salt content of bread decreased by 20%. This is an important public health achievement. Qatar has reduced the salt content in bread produced by its main public bread supplier (which has a one third market share) by 20% since early 2014. This percentage reduction has already been achieved in the main bakeries. The Ministry of Health is monitoring the implementation to ensure that the salt level is maintained below the target percentage. A 10% reduction in salt content of the same bread was planned for the end of 2017.

The Islamic Republic of Iran has adopted legislation on salt reduction in a number of products, including establishing maximum levels of salt in all types of bread (1.8%). This level is still high and the recommendation is to set the benchmark at 1% to ensure effective salt reduction intake strategies.

Other Member States have prepared legislation on salt reduction (e.g., Jordan, Bahrain and Oman) or have revised existing legislation to develop benchmarks for salt content in bread. In Morocco an awareness campaign for 300 bakeries was carried out in the region of Grand Casablanca in 2014, resulting in 70% of the bakers committing to reduce added salt in bread. Oman and the UAE also reviewed their food standards and set the benchmark for salt content in bread at 0.5%.

The present study had some limitations in terms of countries covered, representative samples for different types of bread and geographical coverage in each country. However, it was an indicative study conducted in response to the urgent need for information about the salt content in bread, which is lacking in the Region. Considering the time frame and logistic complications, the samples sizes were limited due to the countries' response and coverage. This study has created more demand by public health policy-makers at regional and national levels to conduct more comprehensive research.

Recommendations

In light of these findings, we make the following recommendations.

1. Although the levels of salt in the regional flat bread is not as high as in European bread (2–3 g/kg) (16); the total salt intake is high in the Region due to the high consumption of bread as a staple food.

2. The amount of salt added to bread and other processed food products should be standardized and relevant legislation developed to guide bakers. Setting an upper limit for salt content in flat bread at 0.5% (5g/kg) is strongly recommended for Jordan, Egypt, Lebanon, Sudan, Pakistan, Afghanistan, Oman, UAE, Qatar, Saudi Arabia and occupied Palestinian territory. However, salt levels at 1% (10 g/kg) or less would be good for countries with high levels of salt content in bread such as the Islamic Republic of Iran, Kuwait, Tunisia and Morocco.

3. A monitoring framework on salt usage in confectionary should be established to track compliance to set standards. Salt reduction, especially among manufacturers, should be mandatory and laws and guidelines should be drawn up to guide the process.

4. Country-wide campaigns to raise awareness of salt usage and its potential health impact should be conducted to enable the public to make informed decisions and to encourage manufacturers to lower salt intake in food products.

5. Similar studies on other food products should be carried out to identify major contributors to total salt intake in national diets.

6. Legislation on mandatory food labelling should be introduced or strengthened to facilitate the attainment of salt reduction targets and help consumers make informed decisions about salt levels in food.

Funding: This study was funded by WHO.

Conflict of interests: None declared.

Évaluation de la concentration de sel dans le pain couramment consommé dans la Région de la Méditerranée orientale

Résumé

Contexte : L'hypertension est le facteur de risque de maladies cardio-vasculaires le plus important dans la Région OMS de la Méditerranée orientale. Une consommation excessive de sel et de sodium est directement liée à l'hypertension, et sa réduction constitue une priorité pour l'OMS. Le pain est le principal produit de première nécessité dans la Région ; diminuer la quantité de sel ajouté à ce produit pourrait donc constituer une mesure efficace pour réduire l'apport en sel.

Objectif : La présente étude avait pour objectif de déterminer la teneur en sodium et en sel du pain de base produit localement dans huit pays de la Région.

Méthodes : Des échantillons de pain ont été collectés de façon aléatoire dans des boulangeries des capitales des pays sélectionnés. La teneur en sodium de ces échantillons a été analysée à l'aide de la technique de spectrométrie d'absorption atomique.

Résultats : La teneur moyenne en sel du pain variait de 4,28 g/kg en Jordanie à 12,41 g/kg en Tunisie. La teneur moyenne en sel et en sodium du pain pour l'ensemble des pays était de 7,63 g/kg (écart-type de 3,12) et 3,0 g/kg (écart-type de 1,23) respectivement. La contribution du pain à l'apport en sel quotidien variait considérablement selon les pays, allant de 1,3 g (12,5 %) en Jordanie, à 3,7 g (33,5 %) en Tunisie.

Conclusion : Les interventions visant à diminuer la consommation de sel des individus devraient avoir pour objectif la réduction du sel ajouté au pain dans tous les pays. La quantité de sel ajouté au pain devrait être standardisée et une législation adéquate devrait être mise au point pour guider les boulangers. Il est vivement recommandé de fixer une limite supérieure pour la teneur en sel du pain plat (pita ou pain arabe) à 0,5 %. Toutefois, des teneurs en sel du pain inférieures ou égales à 1 % conviendraient pour les autres types de pain.

تقييم التركيز الملحي في الخبز الشائع الاستهلاك في إقليم شرق المتوسط

أيوب الجوالدة، منال الخمايسة

الخلاصة

الخلفية: يشكل ارتفاع ضغط الدم أهم عوامل الخطر للأمراض القلبية الوعائية في إقليم شرق المتوسط لمنظمة الصحة العالمية. ويرتبط الإفراط في تناول الملح والصوديوم ارتباطاً مباشراً بارتفاع ضغط الدم، ويمثل خفض معدلاته أولوية لمنظمة الصحة العالمية.

الهدف: سعت هذه الدراسة إلى تحديد مستويات الصوديوم والملح في الخبز المنتج محلياً باعتباره سلعة رئيسية من ٨ بلدان في الإقليم.

طرق البحث: تم جمع عينات خبز عشوائية من مخازن في عواصم مجموعة مختارة من البلدان. وتم تحليل العينات للتعرف على محتوى الصوديوم فيها باستخدام مطياف للامتصاص الذري.

النتائج: تفاوت المحتوى الملحي للخبز من ٤,٢٨ جرام/ كيلوجراماً في الأردن إلى ١٢,٤١ جراماً/ كيلوجرام في تونس. وبلغ متوسط محتوى الملح والصوديوم في الخبز في جميع البلدان ٦٣,٧ جراماً/ كيلوجرام (بانحراف معياري مقداره ١٢,٣) و ٣,٠ جراماً/ كيلوجرام (٢٣,١)، على التوالي. وتباينت مساهمة الخبز في الكمية المتناولة يومياً من الملح تبايناً كبيراً بين البلدان، حيث تراوحت من ١,٣ جراماً (٥,١٢٪) في الأردن إلى ٣,٧ (٥,٣٣٪) في تونس.

الاستنتاج: ينبغي أن تستهدف التدخلات الرامية إلى خفض معدل تناول السكان للملح إلى الحد من مستويات الملح في الخبز في جميع البلدان، وينبغي أن تكون كمية الملح المضافة إلى الخبز موحدة ووضع تشريعات بهذا الخصوص لتوجيه الخبازين. وضع حداً أعلى ٥,٠٪ لمحتوى الملح في الخبز المسطح (خبز بيتا أو عربي) يوصى به بشدة. ومع ذلك مستوى الملح ≥ ١.٠ ٪ مناسب لجميع أنواع الخبز.

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Implementation of the International Code of Marketing of Breast-milk Substitutes in the Eastern Mediterranean Region

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Abstract

Background: Optimal breastfeeding practices and appropriate complementary feeding improve child health, survival and development. The countries of the Eastern Mediterranean Region have made significant strides in formulation and implementation of legislation to protect and promote breastfeeding based on The International Code of Marketing of Breast-milk Substitutes (the Code) and subsequent relevant World Health Assembly resolutions.

Aim: To assess the implementation of the Code in the Region.

Methods: Assessment was conducted by the World Health Organization (WHO) Regional Office for the Eastern Mediterranean using a WHO standard questionnaire.

Results: Seventeen countries in the Region have enacted legislation to protect breastfeeding. Only 6 countries have comprehensive legislation or other legal measures reflecting all or most provisions of the Code; 4 countries have legal measures incorporating many provisions of the Code; 7 countries have legal measures that contain a few provisions of the Code; 4 countries are currently studying the issue; and only 1 country has no measures in place. Further analysis of the legislation found that the text of articles in the laws fully reflected the Code articles in only 6 countries.

Conclusion: Most countries need to revisit and amend existing national legislation to implement fully the Code and relevant World Health Assembly resolutions, supported by systematic monitoring and reporting.

Keywords: International code of marketing of breast-milk substitutes; breastfeeding; child health; malnutrition; infant milk formula

Citation: Al Jawaldeh A, Sayed G. Implementation of the international code of marketing of breast milk substitutes in the Eastern Mediterranean Region. *East Mediterr Health J.* 2018(1):25–32. <https://doi.org/10.26719/2018.24.1.25>

Received: 17/09/17; accepted: 04/01/18

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Introduction

Optimal breastfeeding and appropriate complementary feeding improve child health, survival and development (1). Globally, breastfeeding has the potential to prevent about 820 000 deaths annually among children aged < 5 years if all children aged 0–23 months were optimally breastfed (2). Inappropriate feeding practices lead to infant malnutrition, morbidity and mortality in all countries, and improper practices in the marketing of breast-milk substitutes and related products can contribute to these major public health problems (3).

Almost all mothers can breastfeed successfully, which includes initiating breastfeeding within the first hour of life, breastfeeding exclusively for the first 6 months, and continuing breastfeeding (along with giving appropriate complementary foods) up to 2 years of age or beyond (4). An extensive body of research has demonstrated that mothers and other caregivers require active support for establishing and sustaining appropriate breastfeeding practices (5). The supportive measures at many levels range from legal and policy directives to social attitudes and values, women's work and employment conditions, and healthcare services to enable women to breastfeed (1).

As a minimum requirement to protect and promote appropriate infant and young child feeding, the World

Health Assembly adopted the International Code of Marketing of Breast-milk Substitutes in 1981 and has since strengthened the Code with a number of resolutions (hereafter the International Code and the subsequent relevant resolutions are referred to collectively as the Code) (6). The 1981 resolution urged Member States of the Eastern Mediterranean Region to translate the Code into national legislation, regulations or other suitable measures to monitor compliance with the Code (3). Moreover, the Innocenti Declaration (2005) stated that all governments should implement all provisions of the Code and subsequent relevant World Health Assembly resolutions in their entirety as a minimum requirement, and establish sustainable enforcement mechanisms to prevent and/or address noncompliance (7).

Member States have obligations to take all necessary measures to adopt comprehensive and enforceable normative measures to protect babies and mothers from harmful, inappropriate marketing strategies and practices by baby food manufacturers and distributors. Adopting such measures must be recognized as part of Member States' core obligations under the Convention on the Rights of the Child and other relevant United Nations (UN) human rights instruments to respect, protect and fulfil children's right to life, survival and development; their right to safe and nutritious foods; their right to

enjoyment of the highest attainable standard of health; and to ensure that women's rights are protected from harmful interference by non-state actors, in particular the business sector (8).

Exclusive breastfeeding for the first 6 months and continued breastfeeding for 2 years have major benefits on child health, growth and development by preventing many short- and long-term diseases, as well as affecting the economy of nations by having an impact on intelligence, educational attainment and income later in life (9,10). Despite the many benefits of breastfeeding for both the mother and child, and the numerous global commitments to promote and support breastfeeding, prevalence of the practice remains low, with wealthier countries having lower breastfeeding rates than middle- and low-income countries. Only an estimated 1 in 3 infants aged < 6 months are exclusively breastfed globally. This rate has seen no improvement in the past 2 decades. Fewer than 1 in 5 infants are breastfed for 12 months in high-income countries and only 2 out of 3 children aged 6 months to 2 years receive any breast milk in low- and middle-income countries (11). Globally, the rate of exclusive breastfeeding is only 38%, indicating that countries need to do more to meet the World Health Assembly target of 50% by 2025 (12). Available studies highlight low rates of exclusive breastfeeding for 6 months in most countries of the Region, with the average being of 31.8% in 2012. The lowest rates were documented in Somalia (5.3%) and Tunisia (8.1%); the highest rate was reported in Afghanistan (58%); and in other countries such as Egypt, Syrian Arab Republic, Djibouti, Pakistan, Occupied Palestinian Territories and Sudan, where the rate was ~40% (13). We suggest that the Region has to increase and sustain annual increases of 1.2 percentage points in the rate of exclusive breastfeeding between 2012 and 2025 to meet the WHO global nutrition target of > 50% exclusive breastfeeding (14).

In spite of clear messages on the importance of breastfeeding, global sales of breast-milk substitutes continue to grow at a rapid pace. Sales of breast-milk substitutes totalled US\$ 44.8 billion in 2014 (15), and this number is expected to rise to US\$ 70.6 billion by 2019 (2).

The marketing of breast-milk substitutes presents one of the biggest challenges to breastfeeding. The recently established Global Network for Monitoring and Support for Implementation of the Code (NetCode), coordinated by WHO and UN Children's Fund (UNICEF), provides a timely opportunity to forge and strengthen alliances in support of Code implementation. However, challenges to implementation of the Code still exist, with fewer countries in the developed world than in poor and developing countries having fully implemented the Code. This study sought, therefore, to assess the status of implementation of the Code in the Region. Implementation of the Code is the responsibility of governments (in coordination with healthcare professionals, academia, and nongovernmental and consumer organizations) who can adopt legislation, regulations or measures to protect, promote and support

breastfeeding. The information generated will inform policy-makers at national and regional level about the need to focus more efforts to achieve more effective Code implementation.

Methods

The assessment was conducted in all 22 Member States of the Eastern Mediterranean Region using the WHO Module 3: International Code of Marketing of Breast-milk Substitutes and subsequent World Health Assembly resolutions questionnaire, which was translated into Arabic to suit the Arabic-speaking countries; while the original version was used by non-Arabic-speaking countries. The questionnaire captures key information and data on the status of implementation of the Code in each country.

Data collection

Data were collected using the Module 3 questionnaire by the national nutrition focal persons in all 22 Member States of the Region. All parts of the questionnaire were completed and sent back to the Regional Adviser for Nutrition. The contact information of the person who provided the responses for each module was included, to facilitate follow-up and verification of the information. The nutrition focal persons worked with the relevant departments in the ministries of health, such as legal, nutrition, and maternal and child health, to complete the entire questionnaire. A follow-up teleconference with the nutrition focal persons took place to clarify the information provided. A literature review for electronic copies of legislative documents was obtained from International Baby Food Action Network/International Code Documentation Centre (IBFAN/ICDC) files, e-Library of Evidence for Nutrition Actions (eLENA), internet search engines and government gazettes. It was noted from the literature review that there were no published studies at regional levels of this kind.

Data analysis

The laws of Egypt, Iraq, Jordan and Sudan were translated from Arabic to English by the WHO Regional Office for the Eastern Mediterranean, so that they could easily be compared with the Code on an article-by-article basis. Screening of all national legislation, codes, decrees and policies gathered from all countries in the Region was reviewed by the researcher and compared with the Code articles using spreadsheets.

Results

History of Code implementation in the Eastern Mediterranean Region

Following the adoption of the Code in 1981, a number of World Health Assembly resolutions have clarified or extended certain provisions of the Code every other year (odd years). The first country in the Region to have national legislation was Tunisia (1983), followed by Egypt (1994), Bahrain and Islamic Republic of Iran (1995), Oman (1998), Syrian Arab Republic (2000), Pakistan and Yemen

(2002), Saudi Arabia (2004), Sudan (2005), Afghanistan and Jordan (2009), Djibouti (2010), Lebanon and Occupied Palestinian Territories (2011), Kuwait (2014) and Iraq (2015).

Legislative status

Seventeen of the 22 countries in the Region have enacted legislation to protect breastfeeding. Only Afghanistan, Bahrain, Kuwait, Lebanon, Pakistan and Yemen have comprehensive legislation or other legal measures reflecting all or most provisions of the Code. Egypt, Jordan, Saudi Arabia and Syrian Arab Republic have legal measures incorporating many provisions of the Code. Djibouti, Islamic Republic of Iran, Iraq, Occupied Palestinian Territories, Oman, Sudan and Tunisia have legal measures that contain a few provisions. Libya, Morocco, Qatar and UAE are currently studying the issue, and Somalia has no measures in place.

Coverage of Code articles in national legislation

There is considerable variation in the content of specific provisions contained in national legal measures. Most countries in the Region were guided by the Code in the drafting of their national laws and, as a result, reflected many of the Code articles in their legislation (Figure 1). Notably, there was 100% coverage of the 11 Code articles in the national legislation of Afghanistan, Egypt, Jordan, Kuwait and Lebanon. Bahrain, Pakistan, Saudi Arabia and Syrian Arab Republic incorporated 10 of the Code articles in their national legislation. Other countries such as Djibouti, Islamic Republic of Iran, Iraq, Oman and Tunisia had considerably lower coverage of the Code articles in their legislation.

Among the 17 countries implementing the Code, 12 stated the aim of the Code clearly in their national legislation (Table 1). Of those countries with specified age ranges for designated products, only 13 explicitly set out the scope of the Code in detail and mentioned the age limit of products under the scope of the Code.

However, the age limit of milk products intended and marketed as suitable for feeding young children varied considerably between national legislations; ranging from 0–4 to 0–36 months (Table 2). This variation reflected differences in countries' understanding of the scope of the Code. This is particularly important given the tactics of companies to promote infant formulae for children aged > 1 year; products that WHO guidance considers to be breast-milk substitutes that should be covered by Code-implementing legislation (12). The articles about definitions, information and education were present in 14 national legislations (Table 1). Although the Code contains clear and direct guidance on banning promotion to the general public and prohibiting manufacturers and distributors from seeking direct contact with pregnant women and mothers, and giving financial or material inducements to health workers or members of their families to promote designated products, only 13 national legislations had banned this promotion. Completely prohibiting free samples or low-cost supplies for health services was stated in 15 national legislations. Fifteen countries required labels of designated products to include messages on the recommended age for introduction, need for medical advice on the product, and need for appropriate preparation and use. Articles about the necessity for all products to be of high quality and take account of the climate and storage conditions of the country where they are used were stated in 12 national legislations. Only 10 countries had legal provisions that facilitate the establishment of a formal monitoring and enforcement mechanism. Afghanistan, Egypt, Jordan, Kuwait and Lebanon had articles about duties of persons employed by manufacturers and distributors. This low level of implementation of specific Code articles means that countries have not fully translated the Code into their domestic legislation, and are therefore, not fully protecting breastfeeding and optimal infant feeding, as national legislation should go beyond the minimum standard set by the Code.

Figure 1 Coverage of Code articles in national legislation of countries in the Eastern Mediterranean Region

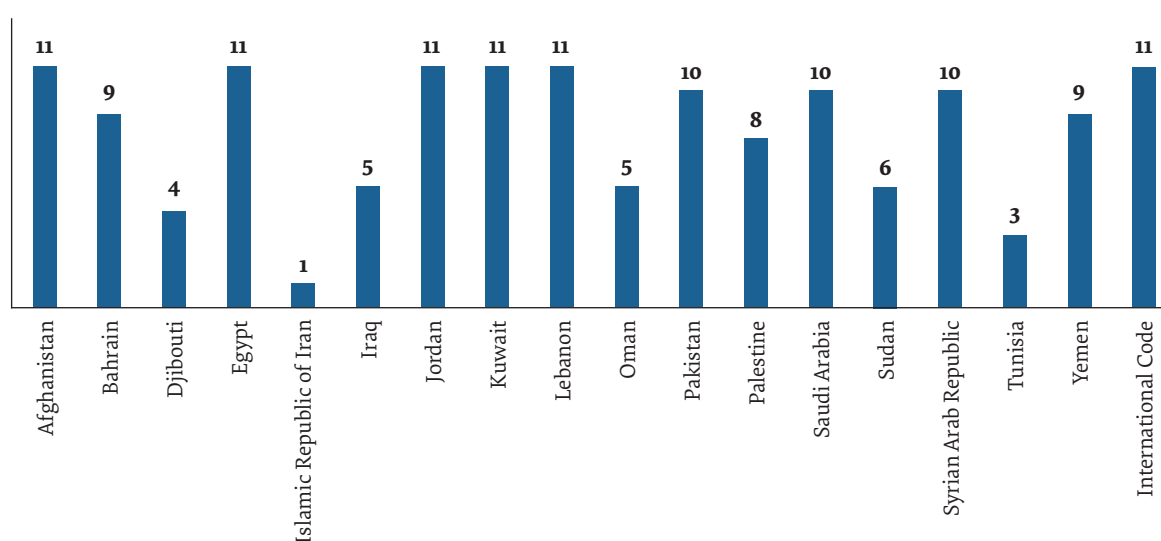


Table 1 Details of International Code of Marketing of Breast-milk Substitutes articles in national legislation across the Eastern Mediterranean Region

	Aim	Scope	Definitions	Information and education	The general public and mothers	Health care systems	Health workers	Persons employed by manufacturers and distributors	Labelling	Quality	Implementation and monitoring
Afghanistan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bahrain	×	✓	✓	✓	✓	✓	✓	×	✓	✓	✓
Djibouti	✓	✓	✓	×	×	✓	×	×	×	×	×
Egypt	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Islamic Republic of Iran	×	×	×	✓	×	×	×	×	×	×	×
Iraq	×	✓	✓	✓	×	✓	×	×	✓	×	×
Jordan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Kuwait	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lebanon	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Oman	×	✓	×	×	✓	✓	✓	×	✓	✓	×
Pakistan	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓
Palestine	✓	×	✓	✓	✓	✓	✓	×	✓	×	✓
Saudi Arabia	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓
Sudan	×	×	✓	✓	✓	✓	✓	×	✓	×	×
Syrian Arab Republic	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓
Tunisia	✓	×	×	×	×	×	×	×	✓	✓	×
Yemen	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	×

Table 2 Scope of the International Code of Marketing of Breast-milk Substitutes by child's age (months) for inappropriate marketing of products

	0-4	0-6	0-12	0-24	0-30	0-36
Afghanistan						
Bahrain						
Djibouti						
Egypt						
Islamic Republic of Iran						
Jordan						
Kuwait						
Lebanon						
Oman						
Pakistan						
Palestine						
Saudi Arabia						
Yemen						

Comparison of number of articles and words in national legislation and the Code

The national laws in Bahrain, Islamic Republic of Iran, Iraq, Oman, Occupied Palestinian Territories and Tunisia had less than half the number of words of the Code (Figure 2). The national legislations of Afghanistan, Djibouti, Lebanon, Saudi Arabia and Yemen had more than double the number of articles of the Code (Figure 3). Although the length of the Code has no direct relationship with its applicability and effectiveness, it is imperative for countries to follow the Code as a minimum standard when enacting laws, as countries that implemented

shorter legislation did not cover all the provisions of the Code.

Discussion and recommendations

1. The development of national legislation to regulate the marketing of breast-milk substitutes is a key component of a comprehensive strategy to protect, promote and support breastfeeding in the Eastern Mediterranean Region. Although 17 countries in the Region have taken some action to implement the Code, monitoring and enforcement are still inadequate, particularly in countries where both laws and legal systems are weak. Many of

Figure 2 Number of words of the International Code of Marketing of Breast-milk Substitutes in national laws of countries in the Eastern Mediterranean Region

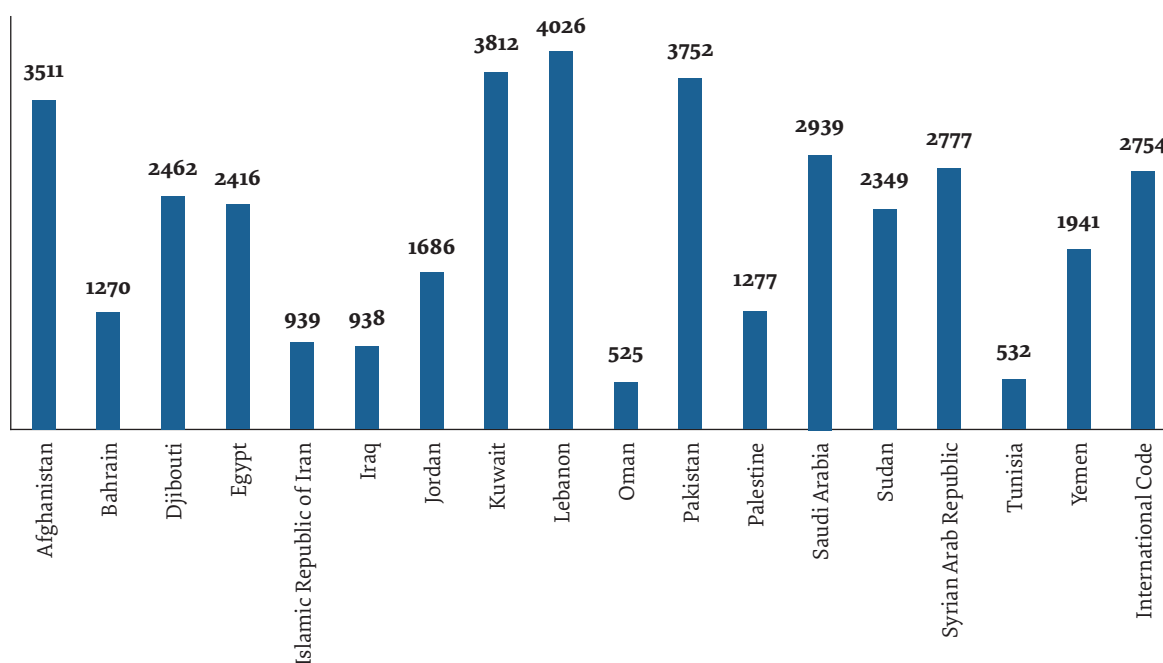
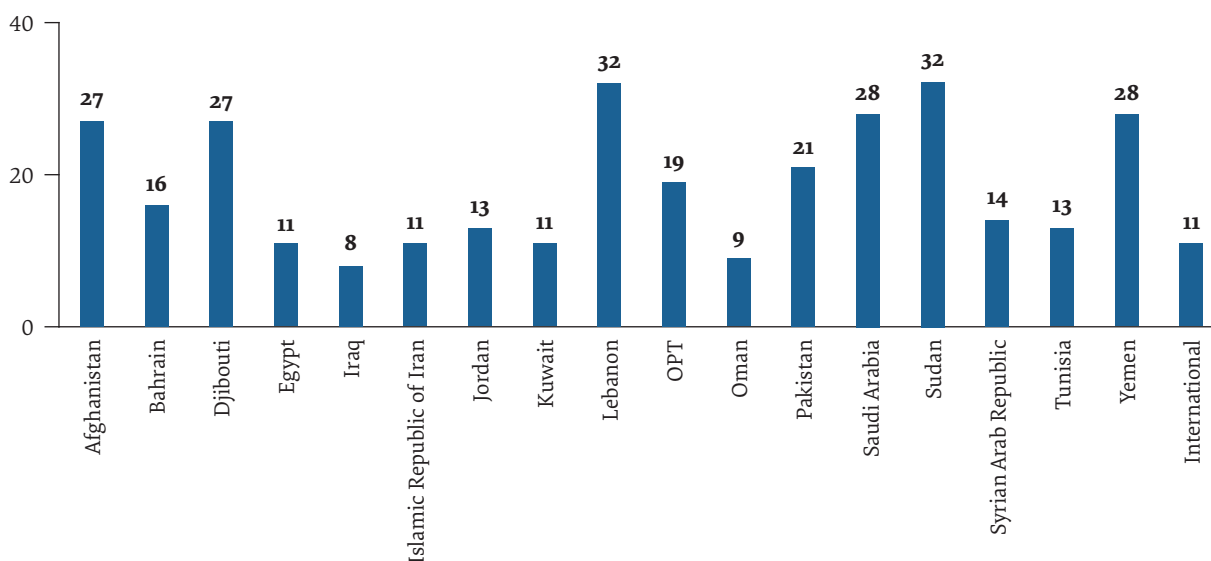


Figure 3 Number of articles of the International Code of Marketing of Breast-milk Substitutes in national laws of countries in the Eastern Mediterranean Region



the national legislations were enacted many years ago and it is therefore imperative for countries to update and amend existing legislation following the World Health Assembly resolutions. However, national laws that do not support implementation of the Code in its entirety have allowed inappropriate marketing practices to prevail. Only effective national legislation, properly enforced, can prevent artificial feeding, which is vastly inferior, from competing unfairly with breastfeeding (11). The results indicate that all countries in the Region, except Somalia, due to long internal conflict and weak government, have been working hard to protect breastfeeding by developing and updating laws and regulations following the Code. However, Member States are urged to implement the Code (11) in its entirety and subsequent relevant World Health Assembly resolutions by developing, enacting and enforcing national laws, regulations or other appropriate measures covering all provisions in the Code, and scaling up efforts to monitor and enforce its implementation. WHO recommends that all infants should be exclusively breastfed for the first 6 months. However, it is estimated that this practice is followed for only 32% of infants in the Region (11). Only about half of children aged 20–23 months are breastfed despite the recommendation that breastfeeding should continue for up to 2 years of age or beyond. The global breast-milk substitutes market exceeds US\$ 44.8 billion per annum, and is expected to rise to US\$ 70.6 billion by 2019 (12). The total absence or presence of weak legislation to protect and promote breastfeeding, along with strong sociocultural beliefs or taboos and powerful marketing strategies of companies manufacturing breast-milk substitutes hamper efforts to promote breastfeeding. The Code and subsequent relevant World Health Assembly resolutions are vital tools to regulate and reduce inappropriate marketing. To enforce implementation of the Code in the Region, Member States are urged to generate more support from influential policy-makers, nongovernmental organizations and civil society at different levels in each country to: (a) amend, strengthen and enforce existing partial Code-related legislation to ensure that all Code provisions and recommendations and subsequent relevant World Health Assembly resolutions are incorporated; (b) urge countries that have been studying but have not yet adopted legal measures to finalize national legislation; and (c) form partnerships, political participations, advocacy and monitoring mechanisms to reinforce implementation and enactment of legislation in countries that lack it.

2. Allocate national and international resources for legislation, monitoring and enforcement.

3. Parliamentarians and policy makers must be sensitized to the importance of Code monitoring and enforcement, and to their specific roles and support, including legislating for the Code, budgetary review, approval and oversight, and political advocacy with constituents.

4. Establish systematic monitoring and reporting mechanisms to support the implementation, monitoring and enforcement of legislation on the Code.

5. Train decision-makers, healthcare providers and relevant officials on the specifics of the Code and its monitoring. This will enhance enactment of the right laws, effective monitoring, and reporting in case of violations.

6. Work on national implementation and revival of the Baby-Friendly Hospitals Initiative to support implementation of the Code in healthcare facilities.

7. A critical mass of civil society organizations is necessary to engage and influence enactment of the proper laws and make amendments in existing laws to address salient issues impeding Code implementation and enforcement.

8. Countries must scale up their efforts to monitor and enforce national legal measures through strong, sustainable multisectoral processes and mechanisms, in particular: (a) funding for monitoring bodies and their activities should be incorporated into relevant national budgeting processes, so as to ensure sustainability; (b) countries should increase capacity for monitoring among designated staff at subnational levels; (c) funding for monitoring bodies and their activities should be incorporated into relevant national budgeting processes, so as to ensure sustainability; and (d) countries should increase capacity for monitoring among designated staff at subnational levels.

9. Technical and legal assistance must be made available to countries through collaborative and coordinated efforts, so as to pool available external expertise and avoid fragmentation. Partnerships among UN agencies and organizations, nongovernmental organizations and other relevant partners must be strengthened, while recognizing the need to avoid conflicts of interest. In this context, the recently established Global Network for Monitoring and Support for Implementation of the Code (NetCode), coordinated by WHO and UNICEF, provides a timely opportunity to forge and strengthen alliances in support of Code implementation in the Region.

Funding: None.

Competing interests: None declared.

Mise en œuvre du Code international de commercialisation des substituts du lait maternel dans la Région de la Méditerranée orientale

Résumé

Contexte : Des pratiques d'allaitement optimales et une alimentation complémentaire appropriée améliorent la santé de l'enfant, ses chances de survie ainsi que son développement. Les pays de la Région de la Méditerranée orientale ont réalisé d'importants progrès dans la formulation et l'application des législations afin de protéger et de promouvoir l'allaitement maternel sur la base du Code international de commercialisation des substituts du lait maternel (le Code) ainsi que des résolutions pertinentes ultérieures de l'Assemblée mondiale de la Santé.

Objectif : Évaluer la mise en œuvre du Code dans la Région.

Méthodologie : L'évaluation a été conduite par le Bureau régional de l'OMS pour la Méditerranée orientale sur la base d'un questionnaire standard de l'OMS. Les données issues des questionnaires et de l'étude approfondie du contenu des codes et réglementations nationaux ont été recueillies et analysées.

Résultats : Dix-sept pays de la Région ont adopté une législation visant à protéger l'allaitement maternel. Seuls six pays possèdent une législation complète ou d'autres mesures juridiques reflétant l'ensemble ou la plupart des dispositions du Code ; quatre pays disposent de mesures juridiques incluant un nombre important de dispositions du Code ; sept pays disposent de mesures juridiques contenant quelques dispositions du Code ; quatre pays étudient actuellement la question ; et seulement un pays n'a mis aucune mesure en place. Une analyse plus poussée de la législation a révélé que les articles des lois ne se conformaient pleinement aux articles du Code que dans six pays.

Conclusions : La plupart des pays doivent revisiter et modifier leur législation nationale actuelle afin de mettre pleinement en œuvre le Code et les résolutions pertinentes de l'Assemblée mondiale de la Santé, avec l'appui du suivi et de la notification systématiques.

تطبيق أحكام المدونة الدولية لتسويق بدائل لبن الأم في إقليم شرق المتوسط

أيوب الجوالده، غادة سيد

الخلاصة

الخلفية: تؤدي ممارسات الرضاعة الطبيعية المثلى والتغذية التكميلية الملائمة إلى تحسين صحة الطفل وبقائه ونمائه. وقد قطعت بلدان إقليم شرق المتوسط شوطاً كبيراً في صوغ وتنفيذ التشريعات المتعلقة بحماية وتعزيز الرضاعة الطبيعية استناداً إلى أحكام المدونة الدولية لتسويق بدائل لبن الأم (المدونة) وقرارات جمعية الصحة العالمية اللاحقة ذات الصلة.

الهدف: تهدف هذه الدراسة إلى تقييم تطبيق أحكام المدونة في إقليم شرق المتوسط.

منهجية البحث: أجرى المكتب الإقليمي لمنظمة الصحة العالمية لشرق المتوسط التقييم باستخدام استبيان منظمة الصحة العالمية المعياري. وتم جمع وتحليل البيانات المستمدة من الاستبيانات ومن دراسة معمّقة لمحتوى المدونات واللوائح الوطنية.

النتائج: عمد سبعة عشر بلداً في الإقليم إلى سن تشريعات لحماية الرضاعة الطبيعية. وتبين أن ٦ بلدان فقط تطبق تشريعات شاملة أو تدابير قانونية أخرى تحتوي على جميع أو معظم أحكام المدونة؛ وتطبق ٤ بلدان تدابير قانونية تحتوي على كثير من أحكام المدونة؛ و٧ بلدان لديها إجراءات قانونية تحتوي على بعض أحكام المدونة؛ وأن ٤ بلدان بصدد دراسة المسألة في الوقت الحالي؛ وأن بلداً واحداً فقط لا يطبق أي تدابير. وأثبت إجراء تحليل إضافي للتشريعات أن عدد البلدان التي أوردت في مواد تشريعاتها جميع مواد "المدونة" في تشريعاتها لم يتجاوز ٦ بلدان.

الاستنتاجات: تحتاج معظم البلدان إلى إعادة النظر في تشريعاتها الوطنية الحالية أو تعديلها لتنفيذ أحكام المدونة وقرارات جمعية الصحة العالمية ذات الصلة تنفيذاً تاماً، مدعومة في ذلك بعملية منهجية للرصد والإبلاغ.

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Prevalence of risk factors for noncommunicable diseases in adults: key findings from the Pakistan STEPS survey

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Background: Pakistan lacks data on the prevalence of risk factors for common noncommunicable diseases (NCDs).

Objectives: This study aimed to determine the prevalence of risk factors for NCDs among a population-based sample in Punjab and Sindh provinces, Pakistan.

Methods: This study was conducted in 2013–2014. The NCD risk factors examined were: current daily smoking, eating fewer than 5 servings of fruits/vegetable a day, low physical activity, overweight and obesity. A total of 7 710 households were selected and 1 adult was enrolled from each household. Data were collected using the WHO STEPS instrument (Step 1 and 2), and analysed according to the STEPS statistical plan.

Results: The prevalence of tobacco use was 19.7%. The majority of the respondents (96.5%) consumed fewer than 5 servings of fruits/vegetables a day, 41.5% had a low level of physical activity, 26.3% were overweight and 14.9% were obese. The prevalence of stage I and stage II hypertension, including those on medication, was 37% and 15.9% respectively. The prevalence of NCD risk factors differed significantly by sex and occupation ($P = 0.0001$) but not by age group ($P = 0.118$), level of education ($P = 0.668$) and province ($P = 0.056$). Only 0.6% of the sample had none of the 5 NCD risk factors while 40% had 3–5.

Conclusion: The high prevalence of NCD risk factors in Punjab and Sindh provinces is of concern. Urgent public health interventions are needed to reduce them, especially in youth and young adults.

Keywords: Hypertension, noncommunicable diseases, Pakistan, physical activity, tobacco use

Citation: Rafique I, Saqib MAN, Munir MA, Qureshi H, Rizwanullah, Khan SA, et al. Prevalence of risk factors for noncommunicable diseases in adults: key findings from the Pakistan STEPS survey. *East Mediterr Health J.* 2018;24(1):33–41. <https://doi.org/10.26719/2018.24.1.33>

Received: 28/06/17; accepted: 21/11/17

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Introduction

Noncommunicable diseases (NCDs) include diabetes, hypertension, cancers, mental health disorders, arthritis, injuries and accidents (1,2). In Pakistan, NCDs are among the top 10 causes of morbidity and mortality, and it is estimated that NCDs and injuries cause 77% of age-standardized deaths (3). Diabetes, hypertension, cancers and other NCDs are common in Pakistan. According to a diabetes survey in 1994, the prevalence of diabetes in the general population was 11% (4,5), and the National Health Survey of Pakistan (NHSP) 1990–94 reported that 24% of urban and 13% of rural populations had diabetes (6). Similarly, the prevalence of pre-diabetes, hypertension and diabetes in the general population of Karachi was reported as 40%, 18% and 8% respectively (7).

Previous studies have reported the prevalence of common NCD risk factors in Pakistan. According to the NHSP, tobacco consumption was 34% in men and 12.5% in women, 24% and 14% of the urban and rural populations, respectively, were overweight, and 17.9% of the rural population had hypertension (6). A recent study in Karachi showed that 53% of the population had abdominal obesity and 45% were tobacco users (7). It is estimated that by 2025, 3.87 million premature deaths caused by NCDs will

occur in Pakistan, with serious economic consequences (8).

Since the NHSP, no national survey on the prevalence of NCDs and their risk factors has been conducted in Pakistan. The STEPS survey 2013–2014 was conducted to determine the prevalence and magnitude of common NCD risk factors in 2 large provinces of Pakistan – Punjab and Sindh. This paper describes the key finding of this survey and compares the findings with local, regional and international data.

Methods

Survey instrument

The STEPS survey was conducted from November 2013 to April 2014. Data were collected on NCD risk factors using World Health Organization (WHO) STEP 1 and 2 instruments of the standard STEPS methodology (9). The NCD risk factors included in the study were: tobacco use, physical inactivity, unhealthy diet, overweight/obesity and raised blood pressure (10–12).

Target population and sample size

The target population was all men and women aged 18 years or above living in Punjab and Sindh; this covers

almost 75% of the total population of Pakistan. A sample size of 7710 individuals (Punjab 4110, Sindh 3600, proportionate to population size of the province) was calculated assuming 95% precision and 5% non-response with representation of urban/rural residents and males/females based on their distribution in the province.

Sampling

A 2-stage stratified sampling approach was used in which the division (the largest administrative unit of provinces, which is followed by districts, *tehsils/talukas* and union councils) was selected as primary sampling units and union councils were selected as secondary sampling units. All 13 divisions of both provinces were selected, while the union councils were selected based on probability proportionate to size with the population in each union council being the measure of size. A total of 257 union councils (137 from Punjab and 120 from Sindh) were selected randomly from both rural and urban union councils. Of the selected union councils, 110 were urban (57 Punjab and 53 Sindh) and 147 were rural (80 Punjab and 67 Sindh). In each urban union council, sample blocks of approximately 2000 people were formed using a quick count and of these, 1 block was picked randomly. From the selected block, a cluster of 150 households was counted and 30 households were selected by taking every fifth household. In rural union councils (average 4–5 villages in each union council), 1 village was selected randomly. A cluster of 150 households was marked from which 30 households were selected by taking every fifth household.

From each selected household, names and ages of all members (male/female) who were 18 years or more were entered in a personnel digital assistant which then randomly selected 1 individual using the Kish method (13).

Data collection

Data were collected using the standard STEPS 1 and 2 instruments; all core and expanded modules of STEPS 1 were included while for STEP 2, only core modules were used. In addition, the optional modules of tobacco policy and injury were also included (14). The questionnaire was adapted to local needs, translated into Urdu, the national language, and back-translated into English for verification. After pilot-testing and making further refinements, the Urdu version of the questionnaire was uploaded on the personnel digital assistant. The consent form and report forms were also translated into Urdu. For clarity, show cards and charts were used as described in the country report (15).

Data collection teams comprised an enumerator, interviewers (male and female) and a supervisor who were trained on the questionnaire and physical measurements. Each team visited the assigned union councils and followed the household and individual selection criteria as described above. The selected individual was interviewed and their height (cm), weight (kg), waist circumference (cm) and blood pressure (BP) (systolic and diastolic) were measured. Height and weight were measured using SECA stadiometer 213 (SECA,

Germany) and SECA 874 weighing machines (SECA, Germany) respectively, and body mass index (BMI) was calculated. Waist circumference was measured at the umbilicus level using a measuring tape. Blood pressure was measured in sitting position using BOSO digital apparatus (BOSO, Germany). Three readings were taken and their average was used. For female participants, both interview and measurements were done by the female interviewer.

Ethical considerations

Ethical clearance for the survey was given by the National Bioethics Committee, Pakistan. Provincial health directorates were informed prior to the survey. Written informed consent was taken from all participants. For participants who could not read, the interviewer read the consent form to them and took their consent.

Data analysis

All data were transferred from the personnel digital assistant to the computer and converted into an *Excel* sheet which was checked, cleaned and transferred to *Epi Info*, 3.5.1. Data were analysed using the WHO STEPS statistical plan. Standard WHO definitions were used to define low physical activity (< 150 minutes of moderate-intensity activity per week, or equivalent), adequate fruit and vegetable consumption (5 servings of fruit and/or vegetables on average per day), overweight (BMI = 25–29 kg/m²), obesity (BMI ≥ 30 kg/m²) and raised blood pressure (systolic blood pressure ≥ 140 and/or diastolic blood pressure ≥ 90 mmHg, or currently on medication for raised blood pressure) (16). Sampling weights were developed based on selection probabilities at 2 stages of sampling for selection of the union councils and households in the survey. The first stage selection was based on the measure of size, i.e. population in each union council in the sampling frame, and the second stage was based on the total number of households in the sample union council. The product of the inverse of probabilities at both stages was the sampling weight. The overall response rate was calculated from household response rate and personal level response rate.

The chi-squared test was used to determine the association between the prevalence of NCD risk factors (current daily smoking, consumption of fewer than 5 servings of fruits/vegetable a day, low physical activity, overweight and obesity) and demographic characteristics and province. A *P*-value < 0.05 was considered statistically significant. For clustering of individuals with risk factors, the number of risk factors (0–5) were analysed. The data were categorized into people with no risk factors, 1–2 risk factors and 3–5 risk factors. The magnitude of the burden of NCD risk factors was calculated by estimating the actual burden among the total population of Pakistan according to recent census data of Pakistan 2017 (17).

Results

A total of 7366 individuals were enrolled. Overall response rate was 95.5%, which was 96.8% in Punjab

and 93.6% in Sindh. The demographic characteristics of study participants are given in Table 1. The majority of the participants were women (57.2%). About 40% had no formal education or had not completed primary school and 62.8% were unpaid (housewives, students, retirees and unemployed people).

Table 2 shows NCD risk factors according to socioeconomic characteristics. The overall prevalence of tobacco use was 19.7% (95% CI: 18.0–21.3%); 13.9% (95% CI: 12.4–15.3%) smoked tobacco and 6.9% (95% CI: 5.7–8.0%) used smokeless tobacco. Among men, 27.8% smoked tobacco and 9.9% used smokeless tobacco; among women, 4.2% smoked tobacco and 4.7% used smokeless tobacco. Figure 1 shows the types of smoking and smokeless tobacco products used. Most tobacco smokers used cigarettes (68%), followed by cigars (29%). As regards smokeless tobacco, 60% used snuff by mouth and 23% chewed tobacco.

Among smokers, 91.4% (95% CI: 89.2–93.6%) were daily smokers and the mean age at starting smoking was 22.1 years. The prevalence of exposure to second-hand smoke at home and in the workplace was 27.3% (95% CI: 25.6–28.9%) and 16.5% (95% CI: 14.8–18.1%) respectively. Men were more exposed to second-hand smoke in the workplace, 30.7% (95% CI: 27.4–34.0%) compared with 7.2% (95% CI: 5.7–8.7%) for women.

Of the total sample, 14.9% (95% CI: 13.4–16.5%) were obese and 26.3% (95% CI: 24.8–27.8%) were overweight (Table 2); 11.3% (95% CI: 10.0–12.7%) were underweight (BMI < 18.5 kg/m²). The prevalence of low fruit/vegetable consumption (< 5 portions a day) and low physical activity (< 150 minutes of moderate-intensity activity

Table 1 Sociodemographic characteristics of participants

Characteristic	% (n = 7 366)
Sex	
Male	42.8
Female	57.2
Overall	
Age group (years)	
18–29	36.0
30–44	36.8
45–59	18.7
60–69	8.5
Education	
No formal schooling	34.2
Some primary schooling	6.0
Primary school completed	14.1
Secondary school completed	11.4
High school completed	19.0
College/university completed	9.4
Postgraduate degree	6.1
Marital status	
Currently married	80.4
Never married	15.8
Other (separated, divorced, widowed)	3.8
Employment	
Government employee	3.7
Nongovernment employee	21.2
Self-employed	12.3
Unpaid ^a	62.8

^aHousewives, students, retirees and unemployed people.

Table 2 Prevalence of noncommunicable disease risk factors by province and sociodemographic characteristics of the respondents

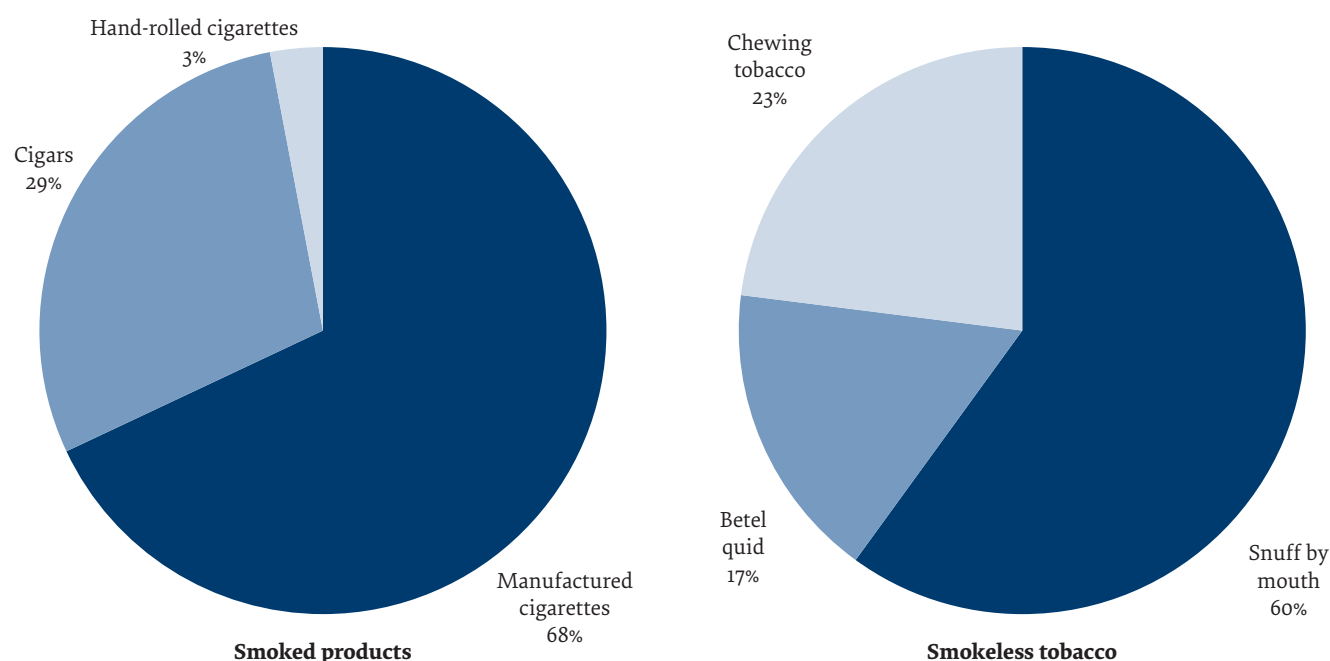
Characteristic	Tobacco use	< 5 servings of fruits/vegetable a day	Low level of physical activity	Overweight	Obese	P-value
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	
Overall	19.7 (18.0–21.3)	96.5 (95.7–97.2)	46.1 (43.3–48.9)	26.3 (24.8–27.8)	14.9 (13.4–16.5)	
Province						0.056
Punjab	17.6 (15.6–19.7)	96.9 (96.1–97.6)	53.2 (50.0–56.5)	28.2 (26.3–30.1)	16.8 (14.7–18.8)	
Sindh	25.0 (22.5–27.6)	94.4 (92.7–96.1)	27.2 (23.6–30.8)	21.3 (19.3–23.3)	10.3 (8.4–12.3)	
Sex						0.0001
Male	35.6 (32.9–38.4)	95.2 (94.0–96.3)	28.2 (25.2–31.3)	26.5 (24.3–28.8)	12.1 (10.2–14.0)	
Female	8.7 (7.0–10.3)	97.4 (96.7–98.0)	58.6 (55.4–61.8)	26.2 (24.3–28.0)	17.1 (15.0–19.1)	
Age group (years)						0.118
18–29	10.9 (9.2–12.6)	96.0 (95.0–97.0)	47.0 (43.7–50.4)	19.1 (16.9–21.2)	8.6 (7.1–10.1)	
30–44	19.2 (16.9–21.5)	96.3 (95.4–97.3)	43.6 (40.1–47.2)	31.3 (28.9–33.6)	14.9 (13.1–16.7)	
45–59	29.6 (26.2–32.9)	97.0 (95.9–98.0)	44.6 (40.6–48.6)	30.8 (27.5–34.1)	18.1 (15.2–21.0)	
60–69	33.9 (29.3–38.5)	97.6 (96.4–98.8)	55.7 (49.6–61.9)	23.2 (18.8–27.5)	15.3 (11.6–18.9)	
Education						0.668
No formal schooling	24.8 (22.3–27.2)	97.5 (96.7–98.2)	40.6 (37.1–44.1)	24.0 (21.9–26.1)	11.7 (9.8–13.5)	
Primary school completed	19.2 (16.0–22.5)	96.1 (94.3–97.9)	47.0 (42.5–51.5)	26.4 (22.5–30.4)	15.8 (12.4–19.3)	

Table 2 Prevalence of noncommunicable disease risk factors by province and sociodemographic characteristics of the respondents (concluded)

Characteristic	Tobacco use % (95% CI)	< 5 servings of fruits/vegetable a day % (95% CI)	Low level of physical activity % (95% CI)	Overweight % (95% CI)	Obese % (95% CI)	P-value
Overall	19.7 (18.0–21.3)	96.5 (95.7–97.2)	46.1 (43.3–48.9)	26.3 (24.8–27.8)	14.9 (13.4–16.5)	
Secondary school completed	16.4 (13.3–19.5)	95.6 (93.5–97.6)	48.8 (43.2–54.5)	27.8 (23.6–32.0)	19.0 (15.2–22.9)	
College/university completed	10.9 (7.9–13.9)	94.1 (91.9–96.2)	52.5 (46.5–58.6)	25.7 (21.0–30.4)	18.4 (13.9–22.9)	
Postgraduate degree	11.8 (7.8–15.7)	91.7 (88.4–95.0)	52.8 (45.3–60.3)	30.7 (24.5–37.0)	20.2 (14.1–26.2)	
Employment						0.0001
Government employee	20.1 (14.4–25.8)	95.4 (92.8–98.1)	32.0 (25.2–38.8)	31.9 (24.8–39.0)	21.3 (15.1–27.5)	
Nongovernment employee	36.9 (33.5–40.3)	96.4 (95.2–97.5)	26.1 (22.3–29.8)	25.2 (22.0–28.5)	9.6 (7.5–11.7)	
Self-employed	31.3 (27.2–35.5)	93.2 (91.1–95.3)	30.9 (25.7–36.0)	30.5 (26.2–34.8)	15.9 (12.4–19.5)	
Unpaid ^a	12.5 (10.9–14.2)	96.7 (96.0–97.5)	55.3 (52.1–58.5)	25.6 (23.9–27.4)	16.0 (14.1–18.0)	

^aHousewives, students, retirees and unemployed people.
CI = confidence interval.

Figure 1 Types of smoking and smokeless tobacco products used



per week) were 96.5% (95% CI: 95.7–97.2%) and 46.1% (95% CI: 43.3–48.9%) respectively. Low physical activity and obesity were more prevalent in women, 58.6% (95% CI: 55.4–61.8%) and 17.1% (95% CI: 15.0–19.1%) respectively than men, 28.2% (95% CI: 25.2–31.3%) and 12.1% (95% CI: 10.2–14.0%) respectively. The prevalence of low physical activity was much higher in the unpaid category – 55.3% (95% CI: 52.1–58.5%) – than other occupation categories. Significant differences in the prevalence of NCD risk factors were seen between men and women ($P = 0.0001$) and the different occupations ($P = 0.0001$). No significant differences were seen between the provinces ($P = 0.056$), age groups ($P = 0.11$) and educational level ($P = 0.6$).

One third of the participants had been advised by their doctors to eat fruits or vegetables, and reduce salt and fat in their diet. Similarly, a quarter had been advised to quit tobacco, exercise and maintain a healthy body weight. Based on self reports, 2.7% (95% CI: 2.1–3.2%) and 1.0% (95% CI: 0.7–1.3%) had been diagnosed with diabetes and high cholesterol levels respectively in past 12 months. Similarly, 6.3% (95% CI: 5.3–7.3%) reported experiencing chest pain from heart disease or stroke in the past 12 months.

Table 3 shows the prevalence of stages I and II hypertension (including and excluding those on medication) by province, sex and age group. Stage I

Table 3 Prevalence of stages I and II hypertension including and excluding those on medication by province, sex and age group (n = 7020 whose physical measurements were taken)

Variable	Stage I including medication % (95% CI)	Stage II including medication % (95% CI)	Stage I excluding medication % (95% CI)	Stage II excluding medication % (95% CI)
Overall	37.0 (34.9–39.0)	15.9 (14.5–17.3)	32.5 (30.4–34.5)	9.9 (8.9–10.8)
Province				
Punjab	35.9 (33.2–38.6)	14.8 (13.1–16.5)	31.9 (29.2–34.5)	9.4 (8.2–10.6)
Sindh	39.9 (37.5–42.3)	18.6 (16.6–20.6)	34.3 (32.0–36.5)	11.0 (9.6–12.4)
Sex				
Male	39.3 (36.8–41.9)	14.6 (13.0–16.3)	36.8 (34.2–39.4)	11.1 (9.7–12.5)
Female	35.4 (32.8–37.9)	16.8 (14.9–18.6)	29.3 (26.9–31.7)	9.0 (7.8–10.2)
Age group (years)				
18–29	23.1 (20.8–25.4)	5.8 (4.7–6.9)	21.5 (19.2–23.7)	3.8 (2.9–4.6)
30–44	37.2 (34.5–39.8)	14.9 (13.1–16.7)	33.3 (30.6–36.0)	9.7 (8.2–11.2)
45–59	50.8 (46.6–55.0)	25.0 (21.8–28.1)	44.6 (40.2–49.0)	15.6 (12.9–18.2)
60–69	60.0 (53.9–66.1)	39.4 (33.8–45.0)	51.0 (44.5–57.5)	25.8 (20.8–30.8)

Stage I: systolic blood pressure > 140 mmHg and diastolic blood pressure > 90 mmHg; stage II: systolic blood pressure > 160 mmHg and diastolic blood pressure > 100 mmHg.
CI = confidence interval.

Table 4 Risk factor groups for noncommunicable diseases, overall and by sex and age group

Variable	No risk factors % (95% CI)	1–2 risk factors % (95% CI)	3–5 risk factors % (95% CI)	χ^2 (P-value)
Overall	0.6 (0.4–0.9)	59.3 (57.0–61.7)	40.0 (37.6–42.4)	
Sex				0.447 (0.800)
Male	1.1 (0.6–1.6)	61.7 (59.0–64.3)	37.2 (34.6–39.9)	
Female	0.3 (0.1–0.4)	57.6 (54.6–60.6)	42.1 (39.1–45.1)	
Age groups (years)				7.792 (0.020)
18–44	0.8 (0.5–1.1)	64.9 (62.4–67.5)	34.3 (31.7–36.8)	
45–69	0.3 (0.1–0.6)	45.8 (42.1–49.5)	53.9 (50.2–57.6)	

CI = confidence interval.

Table 5 Magnitude of the burden of NCD risk factors based on their prevalence in the survey, overall and by sex

NCD risk factor	Total	Males	Females
Population ^a	104.680 million	53.596 million	51.083 million
Tobacco use	19.7% (20.6 million)	35.6% (19.1 million)	8.7% (4.4 million)
Low fruit/vegetable consumption	96.5% (101.0 million)	95.2% (51.0 million)	97.4% (49.8 million)
Low level of physical activity	46.1% (48.2 million)	28.2% (15.1 million)	58.6% (29.9 million)
Overweight	26.3% (27.5 million)	26.5% (14.2 million)	26.2% (13.4 million)
Obese	14.9% (15.6 million)	12.1% (6.5 million)	17.1% (8.7 million)

^aPopulation of people aged ≥ 18 years.

NCD = noncommunicable disease.

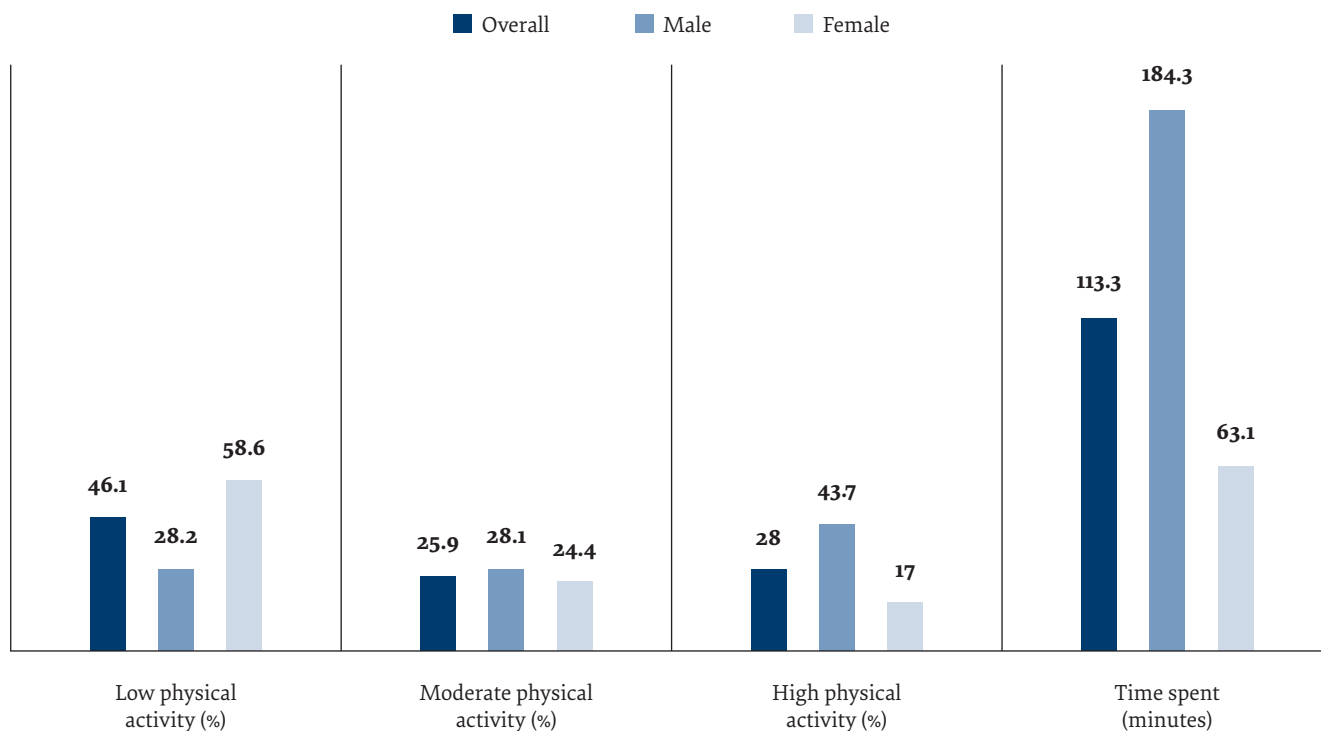
was defined as systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg. Stage II was defined as systolic blood pressure ≥ 160 mmHg and diastolic blood pressure ≥ 100 mmHg. The use of medications was self-reported. The overall prevalence of stage I and II hypertension was 37.0% (95% CI: 34.9–39.0%) and 15.9% (95% CI: 14.5–17.3%) respectively including those who were currently on medication.

Table 4 shows the combined risk factors for NCDs

according to sex and age group. Only 0.6% of the participants had none of the risk factors; 40% had 3–5 and 59.3% had 1–2 risk factors which differed significantly according to age group ($P = 0.02$).

The magnitude of the burden of NCD risk factors in Pakistan is shown in Table 5. A prevalence of 96.5% with low fruits/vegetable consumption represents 101.01 million Pakistanis, while 46.1% with a low level of physical activity equates to 48.2 million of the population,

Figure 2 Level of and time spent on physical activity by sex



and 26.3% overweight represents 27.5 million of the population.

Discussion

This was the first national NCD survey for Pakistan which was done in 2 large provinces (Punjab and Sindh) using WHO STEPwise methodology. Key findings were high tobacco consumption, low physical activity and low consumption of vegetables and fruits. Similarly, the majority of the participants were either overweight or obese. The magnitude of the burden of NCDs showed that millions of people in Pakistan have NCD risk factors. Only 0.6% of our sample had none of the 5 main risk factors. Stage I hypertension was 37% while stage II hypertension was 15.9%

Tobacco use

Almost one fifth of the population (19.7%) used tobacco, which is similar to the 19.1% reported for people 18 years and above in Pakistan in the recent Global Adult Tobacco Survey (GATS) (18–20). The consistency in the results of both surveys may be due the same period of data collection, i.e. 2014. Another survey on tobacco use in youth (Global Youth Tobacco Survey) among 13–15-year-olds reported tobacco use in 10.7% of school students (13.3% for boys and 6.6% for girls) (21). The use of smokeless tobacco was 6.9% in our STEPS survey while it was 7.7% in the GATS (19,20). This difference might be due to the fact that the GATS sample was drawn from 2 different provinces – Khyber Pakhtunkhwa and Baluchistan – and the use of smokeless tobacco such as *naswar* was high in Khyber Pakhtunkhwa. In young people, smokeless tobacco consumption was slightly lower than adults (21).

Tobacco smoking was lower in Pakistan than some nearby countries: 31% in Nepal (22), 44% in Bangladesh (23) and 30% in Myanmar (24). A possible reason for this may be that the prevalence of tobacco in Pakistan is reported to be decreasing as a result of various steps taken by the government (19).

Low physical activity

The prevalence of low physical activity was high in our survey, 46%, compared with global population estimate of 23% reported in the global NCD report (Figure 2) (25). Compared with nearby countries, low physical activity was more prevalent in Pakistan than Sri Lanka (25%) (26), Bangladesh (38.6%) (23) and India (42%) (27). The high prevalence of low physical activity might be due to an increase in urbanization in the country and changing lifestyles which may differ between countries. People are switching to more indoor activities such as playing games on mobile phones and the computer, and watching television. There is a need to create awareness among the community about the benefits of physical activity. It is possible that the questions asked about different types of physical activity do not truly describe the situation in urban and rural areas where, for example, people may be engaged in carrying or lifting heavy loads, and digging or construction work. Generally these activities (work) are carried out by people living in or coming from rural areas compared with urban areas.

Fruit and vegetable consumption

In the present study, 96.5% of our sample consumed fewer than 5 servings of fruits and vegetables per day. Consumption of fruits and vegetables was also low in Bangladesh (93%) (23) and Sri Lanka (82.4%) (26). In India,

these figures range from 76% to 99% in different states (27). In high-income countries like Qatar, 91% of the population consumed fewer than 5 servings of fruits and vegetables a day (28). The low consumption of fruits and vegetables might be due to the cultural context as people prefer fatty diets that include foods like samosas, *pakor*as (fried snack) and sweets. Fruits and vegetables are important for a healthy diet as they provide vitamins, minerals, fibre and phytochemicals. Many studies have shown that an adequate daily intake of fruits and vegetables results in a lower risk of chronic disease, especially heart diseases (29), diabetes and cancers (30,31). Therefore, there is a need to educate the community about the health benefits of eating fruits and vegetables.

Hypertension

Hypertension was seen in 53% of our sample; 37% had stage I hypertension and 15.9% stage II hypertension, which is higher than reported for India and Bangladesh (23,27). These figures are lower than those reported from Palau, Micronesia region (55% stage I and 21% stage II hypertension) (32), and comparable to Malawi (stage I) (32%) (33) and Nepal (25.7%) (22). The high prevalence of hypertension is likely related to unhealthy diets and low physical activity as discussed above.

Limitations

The study was conducted in 2 large provinces of Pakistan (Punjab and Sindh) which are home to 75% of the Pakistan population. However, the findings cannot be generalized to the other 2 provinces (Khyber Pakhtunkhwa and Baluchistan) or the regions (Federal, Azad Jammu Kashmir, Gilgit Baltistan and Federal Administered Tribal Areas) because of socioeconomic and cultural differences.

Conclusions

The poor situation of NCD risk factors in Pakistan – increasing trends of tobacco consumption, physical

inactivity, unhealthy diet, overweight and obesity – demands urgent public health interventions. Lack of awareness among the public about NCD risk factors, cheap availability of cigarettes, weak implementation of anti-tobacco laws, and absence of a national NCD policy are some of the key factors responsible for the growing burden of NCDs in the country. Interventions are needed to increase the intake of fruits and vegetables and the amount of exercise taken, especially in youth and young adults, and rigorously implement tobacco control legislation. To control NCDs, different stakeholders, including departments of health, education, sports, environment and media, need to work together to plan more physical activities in educational institutions and raise awareness through media about the importance of a healthy diet in youth and adults.

Acknowledgements

We acknowledge the technical and financial assistance of WHO and the technical support of Ms Melanie Cowan (WHO headquarters) throughout the survey. We thank Mr Khalid Mahmood for his support in the sample calculation and weighting. We also thank the provincial coordinators: Dr Rizwan Iqbal, Dr Iffat Shabbir, Dr Ayaz Mustafa; the field supervisors: Dr Saira Bashir (deceased), Mr Muhammad Kashif Munir, Mr Shakeel Ahmed Dahar, Mr Allah Rakhia, Dr Faiza Bashir, Ms Sumera Naz and the data collection teams. We acknowledge the efforts of Mr Mehmood Ahmed, Mr Saeed Ahmed Shahid, Mr Khalid Mehmood, Mr Hafiz Saqib, Mr Zulfiqar Ahmed and Mr Junaid Raza for their assistance in the survey. Last but not least, we sincerely acknowledge the participation of the respondents who voluntarily took part in the study.

Funding: Financial assistance for the survey was provided by the World Health Organization.

Competing interests: None declared.

Prévalence des facteurs de risque pour les maladies non transmissibles chez l'adulte : principaux résultats d'une enquête STEPS au Pakistan

Résumé

Contexte : Le Pakistan ne dispose pas de données sur la prévalence des facteurs de risque pour les maladies non transmissibles (MNT) courantes.

Objectifs : La présente étude visait à déterminer la prévalence des facteurs de risque de MNT dans un échantillon de la population des provinces du Penjab et de Sindh.

Méthodes : L'étude a été menée entre 2013 et 2014. Les facteurs de risque des MNT examinés étaient les suivants : tabagisme quotidien, moins de cinq portions de fruits et légumes par jour, activité physique réduite, surcharge pondérale et obésité. Un total de 7710 ménages a été sélectionné et un adulte de chacun d'entre eux a participé à l'étude. Les données ont été recueillies à l'aide de l'outil STEPS de l'OMS (STEP 1 et 2), et analysées conformément au plan statistique mis au point dans le cadre de cette enquête STEPS.

Résultats : La prévalence du tabagisme était de 19,7 %. La majorité des répondants (96,5 %) consommaient moins de cinq fruits et légumes par jour, 41,5 % avaient une activité physique réduite, 26,3 % étaient en surpoids et 14,9 % étaient obèses. La prévalence de l'hypertension de stade 1 et 2, dont les personnes sous traitement médicamenteux, était de 37 % et de 15,9 % respectivement. La prévalence des facteurs de risque pour les MNT différait significativement selon le sexe ($p = 0,0001$) et la profession ($p = 0,0001$), ce qui n'était pas le cas pour le groupe d'âge ($p = 0,118$), le niveau d'éducation ($p = 0,668$) et

la province ($p = 0,056$). Seul 0,6 % de l'échantillon ne présentait aucun de ces cinq facteurs de risque, tandis que 40 % en présentaient entre trois et cinq.

Conclusion : La forte prévalence des facteurs de risque pour les MNT dans les provinces du Penjab et de Sindh, est préoccupante. Des interventions de santé publique sont requises de toute urgence afin de réduire ces facteurs de risque, notamment chez les jeunes et les jeunes adultes.

انتشار عوامل الخطر للإصابة بالأمراض غير السارية في صفوف البالغين: النتائج الرئيسية المستمدة من مسح «أداة الترصد التدريجي» في باكستان

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الخلاصة

الخلفية: تفتقر باكستان إلى بيانات بشأن انتشار عوامل خطر الإصابة بالأمراض غير السارية الشائعة.

طرق البحث: أجريت هذه الدراسة في عامي ٢٠١٣-٢٠١٤ للوقوف على معدل انتشار عوامل الخطر للأمراض غير السارية الشائعة (التدخين اليومي الحالي، وتناول أقل من خمس حصص من الفواكه/الخضروات يومياً، وانخفاض النشاط البدني، وزيادة الوزن، والبدانة) بين عينة سكانية في إقليم البنجاب والسند. وتم اختيار ما مجموعه ٧٧١٠ أسرة وأدرج في الدراسة شخص بالغ واحد من كل أسرة. وجمعت البيانات باستخدام «أداة الترصد التدريجي» لمنظمة الصحة العالمية (الخطوات ١ و ٢)، وأجرينا التحليل وفقاً للخطة الإحصائية لأداة الترصد التدريجي.

النتائج: بلغ معدل انتشار تعاطي التبغ ١٩,٧٪. وتبين أن أغلبية المستجيبين يستهلكون أقل من خمس حصص من الفواكه/الخضروات يومياً، وأن ٤١,٥٪ يعانون من انخفاض مستوى النشاط البدني، و٢٦,٣٪ يعانون من زيادة الوزن، و١٤,٩٪ يعانون من البدانة. وبلغ معدل انتشار ارتفاع ضغط الدم للمرحلتين الأولى والثانية، بما في ذلك المرضى الذين يأخذون أدوية، ٣٧,٩٪ و١٥,٩٪ على التوالي. وتفاوتت عوامل الخطر للأمراض غير السارية الشائعة تفاوتاً كبيراً حسب الجنس ($P = 0,0001$)، والوظيفة ($P = 0,0001$)، ولكن ليس حسب الفئة العمرية ($P = 0,118$) ومستوى التعليم ($P = 0,668$) والإقليم ($P = 0,056$). وبلغت نسبة أفراد العينة الذين لم تظهر لديهم عوامل خطر للإصابة بالأمراض غير السارية الشائعة الخمسة ٠,٦٪ فقط، في حين ظهرت ٣-٥ عوامل لدى ٤٠٪ منهم.

الاستنتاج: ثمة بواعث قلق تتمثل في ارتفاع معدل انتشار عوامل الخطر المرتبطة بالأمراض غير السارية الشائعة في إقليم البنجاب والسند، بما في ذلك استهلاك التبغ، وانخفاض مستوى النشاط البدني، وتناول وجبات غير صحية، والبدانة. ويلزم إجراء تدخلات عاجلة على مستوى الصحة العامة للحد من عوامل الخطر هذه، لا سيما في صفوف الشباب وصغار البالغين.

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Impact of economic sanctions on access to noncommunicable diseases medicines in the Islamic Republic of Iran

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Abstract

Background: It has been argued that economic sanctions and the economic crisis have adversely affected access to drugs.

Aim: To assess the impact of economic sanctions on the Iranian banking system in 2011 and Central Bank in 2012 on access to and use of drugs for noncommunicable diseases (NCDs).

Methods: An interrupted time series study assessed the effects of sanctions on drugs for diabetes (5 drug groups), asthma (5 drug groups), cancer (14 drugs) and multiple sclerosis (2 drugs). We extracted data from national reference databases on the list of drugs on the Iranian pharmaceutical market before 2011 for each selected NCD and their monthly sales. For cancer drugs, we used stratified random sampling by volume and value of sales, and source of supply (domestic or imported). Data were analysed monthly from 2008 to 2013.

Results: Market availability of 13 of 26 drugs was significantly reduced. Ten other drugs showed nonsignificant reductions in their market availability. Interferon $\alpha 2b$ usage reduced from 0.014 defined daily doses per 1000 inhabitants per day (DID) in 2010 to 0.008 in 2013; and cytarabine from 1.40 mg per 1000 population per day in 2010 to 0.96 in 2013. Selective $\beta 2$ -adrenoreceptor agonists usage reduced from 8.4 to 6.8 DID in the same time period.

Conclusion: There is strong evidence that sanctions have had a negative effect on access to drugs, particularly those that depended on the import of their raw material or finished products.

Keywords: drug access, drug shortage, economic crisis, economic sanctions, noncommunicable diseases.

Citation: Kheirandish M, Varahrami V, Kebriaeezade A, Majid Cheraghali A. Impact of economic sanctions on access to noncommunicable diseases medicines in the Islamic Republic of Iran. *East Mediterr Health J.* 2018;24(1):42–51. <https://doi.org/10.26719/2018.24.1.42>

Received: 30/11/17; accepted: 13/02/18

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Introduction

Access to drugs is one of the main goals of all health systems (1). Many countries face important challenges in the provision of access to drugs, particularly for the treatment of noncommunicable diseases (NCDs) (2). According to the World Health Organization (WHO), prevention and control of NCDs is a major challenge to achieve Sustainable Development Goals and universal health coverage (3). NCDs have a high prevalence and burden, therefore, ensuring access to essential drugs to control them is vital for health systems to achieve their objectives and reduce costs. Factors outside the health systems can negatively or positively affect access to drugs; however, such factors have not received adequate attention in research studies (4).

After the imposition of economic sanctions upon the Islamic Republic of Iran, concerns were raised about potential public health implications, and in particular, access to drugs. The sanctions were expanded and reached their height by targeting the banking system and the Central Bank of Iran (CBI) in 2011 and 2012, respectively. There were many reports of drug shortages and public

concern about patients' difficulties in accessing essential drugs (5). Adequate access to drugs depends on a myriad of individual and systemic factors that include: individual need and demand for drugs; availability of drugs in the health sector; and appropriate distribution, prescribing and affordability of drugs at the time of use (6). The negative impact of economic hardship on health systems and public health has been reported in several countries, regardless of the source of the hardship (7). Despite the claim that sanctions only target political aspects, some studies have suggested that they may affect the general population (8–11). Although countries may use a plethora of policies to avert the negative impact of economic hardship on health systems and access to drugs, such policies may not succeed in ensuring continuation of access at the level achieved without economic hardship (7,12,13).

NCD drugs have a critical role in attaining universal health coverage, which ensures access to effective, high-quality and affordable health services (3). According to the framework introduced by WHO, there are 4 factors that affect access to medicines: rational selection and

use of drugs, affordable prices, sustainable financing and reliable health and supply systems (14). Economic sanctions can influence the size of an economy and lead to a downturn through limitation of import and export activities and creation of difficulties in financial transactions. Consequently, countries under economic sanctions will face a lack of sources in different areas including health, and several studies have illustrated direct and indirect impacts of the economic crisis on public health (9,13). Economic sanctions can also lead to inflation, decreased household spending and health insurance system dysfunction (due to financial pressure as a result of increasing costs). Although the Islamic Republic of Iran has its own domestic pharmaceutical industry that produces a large proportion of drugs for NCDs, and despite growth in recent years, it is still dependent on imported drugs, raw materials and intermediates (15). Import restrictions cause problems for the health sector in ensuring a sustainable supply system (16,17). Despite imposition of economic sanctions against other countries in recent decades, there is little to no robust research evidence assessing the impact of sanctions on access to drugs.

In this study, we used interrupted time series analyses to assess the impact of economic sanctions on access to NCDs medicines in the Islamic Republic of Iran.

Methods

Study design

Economic sanctions were imposed upon the Iranian banking system and CBI in 2011 and 2012, respectively. An interrupted time series model was used to assess the immediate and gradual effects of these sanctions on the monthly availability of drugs.

Selection of therapeutic groups

As NCD drugs usually follow steady trends in utilization, any significant change could be a result of problems in their supply chain (18). To obtain a better picture of the impact of economic sanctions on access to drugs, we selected a sample of therapeutic groups based on the following criteria. (1) More prevalent diseases. Due to high utilization of drugs for such diseases, any drug shortages will have a negative impact on public health. (2) Requirement for expensive imported drugs, to assess the impact of sanctions on importation. (3) Existing domestic drug production, to assess the degree of independence of the domestic pharmaceutical industry. (4) Existence of reports about drug shortage (5,19). We selected 4 groups of drugs, for treatment of asthma, diabetes (20), cancer and multiple sclerosis (21,22).

Selection of drugs

Drugs that were available in the Iranian pharmaceutical market before 2010 were extracted from the national pharmaceutical sales statistics database (in Farsi known as: Amarnameh Daroii Iran) for selected NCD drugs. This was to ensure that the drugs were on the market prior to the sanctions. Monthly sales data for 2008–2013 were

gathered for all important drugs for diabetes, asthma and multiple sclerosis. Cancer drugs were selected using a random stratified approach in which volume of sales, monetary value of sales, and domestic production or import of drugs were used for stratification.

Data sources

There are two reliable pharmaceutical databases: Iran Drug List and Amarnameh Daroii Iran, which are published by the Food and Drug Administration of the Islamic Republic of Iran (Iran FDA). We used the Iran Drug List to identify the drugs that are approved by Iran FDA, and we used Amarnameh Daroii Iran to obtain the monetary value and volume of sales of all selected NCD drugs, and whether they were recorded in generic or brand names.

Data preparation

Value and volume of sales for each drug in each month were harmonized based on the generic name, dosage form, dose and type of supply (domestic/imported). Data errors were identified and rectified. Defined daily dose (DDD) indicator was used to standardize the value and volume sales data. DDD for each drug was extracted from the latest version of Anatomical Therapeutic Chemical (ATC) Classification System and DDD assignment guidelines (2013) obtained from the WHO website (23). DDD alterations were considered using the list available on the WHO website (24). The only change in DDD was for gliclazide, which was modified to 60 mg from 160 mg in 2011. For each month, the number of DDDs per 1000 population per day (DID) was calculated as a proxy to assess the availability of drugs in the national market (25). For drugs in the cancer group, except tamoxifen, raloxifene and interferon $\alpha 2b$, there were no identified DDDs, therefore, according to the WHO recommendation, the daily consumption was calculated in milligrams per 1000 inhabitants (23). For combined inhalers that had no DDD, the unit dose index was obtained as described by the WHO (26).

Taking into account the substitution probability of drugs with similar therapeutic effects, those for treatment of diabetes and asthma were assessed based on their ATC classification; for the multiple sclerosis group, interferon $\beta 2a$ and interferon $\beta 2b$ were analysed; and for the cancer group, due to different methods of use and treatment protocols, drugs were assessed individually (Table 1).

Data analysis

Our sample included 68 monthly data from 2008 to 2013; that is, 36 months before and 32 after the banking system sanctions, and 48 months before and 20 after the CBI sanctions. This enabled us to assess the immediate and gradual effects of sanctions on access to drugs using interrupted time series analysis. Several diagnostic analyses were conducted. The Durbin-Watson parameter between 1.88 and 2.08 was acceptable in this model (27) and parameters outwith this range were corrected using ARIMA (autoregressive integrated moving average) models. To determine the stationary

Table 1 List of drugs for noncommunicable diseases included in the study

Diabetes (A10)		
ATC code	Name	Selected medicines (by INNs)
A10BA	Biguanides	Metformin
A10BB	Sulfonylureas	Glibenclamide, gliclazide
A10BG	Thiazolidinediones	Pioglitazone
A10BX	Other blood glucose lowering drugs, excluding insulins	Repaglinide
A10A	Insulins and analogues	NPH, Regular, Aspart, Glargine, Biphasic isophane
Asthma (R03)		
ATC code	Name	Selected medicines (by INNs)
R03CC	Selective β_2 -adrenoreceptor agonists	Salbutamol, salmeterol, formoterol
R03BA	Glucocorticoids	Budesonide, beclomethasone
R03BB	Anticholinergics	Ipratropium bromide
R03AK	Adrenergics in combination with corticosteroids or other drugs, excluding anticholinergics	Salmeterol/fluticasone, formoterol/budesonide, salbutamol/beclomethasone
R03AL	Adrenergics in combination with anticholinergics	Salbutamol/ipratropium bromide
Multiple sclerosis (L03)^a		
ATC code	Name	Selected medicines (by INNs)
L03AB	Interferons	Interferon β_1a
L03AB	Interferons	Interferon β_1b
Cancer (L01, L02, G03)^b		
ATC code	Name	Selected medicines (by INNs)
L01XE	Protein kinase inhibitors	Imatinin ^b
L01XE	Protein kinase inhibitors	Erlotinib ^b
L01BB	Purine analogues	Cladribine
L01BB	Purine analogues	Fludarabine phosphate
L01BC	Pyrimidine analogues	Cytarabine
L01BC	Pyrimidine analogues	Capecitabine
G03XC	Selective estrogen receptor modulators	Raloxifene
L02BA	Antiestrogens	Tamoxifen
L02AE	Gonadotropin releasing hormone analogues	Busereline acetate
L01CD	Taxanes	Docetaxel
L01DA	Actinomycines	Dactinomycin
L03AB	Interferons	Interferon α_2b
L01DB	Anthracyclines and related substances	Daunorubicin
L01XX	Other antineoplastic agents	Estramustine sodium phosphate

^aDue to different DDDs and treatment approaches used for the prescription of interferon β_1a and β_1b , they were analysed separately.

^bDue to non-defined DDDs for many cancer medicines and/or different indications, cancer medicines in some ATC classification were analysed separately.

DDD = defined daily dose; INN = International Nonproprietary Name.

status of the series we used the Dicky–Fuller test, and to assess heteroscedasticity in the residuals, the White test was applied. When heteroscedasticity was detected, the generalized least squares technique was used (28). The impact of each sanction in 2011 and 2012 was assessed separately. Markov and Chaw breakpoint tests were applied to determine which sanction had the greatest impact on drug availability. As the sale of drugs in the first month of each year (in Iranian calendar) significantly reduced due to the New Year holidays in the Islamic Republic of Iran, it was accounted as a dummy variable in the model.

Results

Twenty-six drugs (as identified according to ATC classification and International Nonproprietary Names) were entered in the model (Table 1): 14 had both domestic and imported types; 9 were solely imported with no local production; and the rest were produced locally. There was a significant reduction in the availability of 13 drugs, of which 6 were solely imported. The availability trends of these 13 drugs are shown in Figure 1 (diabetes and asthma) and Figure 2 (cancer). The average use of 26 samples based on October and November in each year is shown in Table 2. Ten other drugs showed reduced availability, although the reduction was not significant.

The results of time series analysis for each therapeutic group were as follows.

Diabetes group

The thiazolidinediones were produced domestically, whereas the other drugs had both domestic and imported types (Table 3). The generalized least squares technique was applied for thiazolidinediones due to heteroskedasticity in the residuals. While there were no changes in availability of the 5 drug groups after banking system sanctions, 2 (sulfonylureas and other blood glucose lowering agents) demonstrated gradual reduction after CBI sanctions. No immediate reduction in availability was observed in this group.

Asthma group

Both domestic and imported types of all drugs were available (Table 3). The interrupted time series models for anticholinergics after both sanctions and adrenergics in combination with anticholinergics after the banking system sanctions were not significant, so their availability could not be assessed. The availability of 2 drug groups was reduced during sanctions. Selective β_2 -adrenoreceptor agonists were affected by both sanctions and showed gradual changes in availability. No immediate reduction in availability was observed for any of the drugs.

Multiple sclerosis group

Interferon β_{1a} had both domestic and imported types, whereas merely imported type of interferon β_{1b} had

only an imported type before 2010 (Table 3). Although the availability of both interferons was reduced after the sanctions, the results were not significant.

Cancer group

Two of the 14 drugs were produced domestically; 4 were produced domestically and imported; and 8 were available as imported products only (Table 3). Regression models for daunorubicin after both sanctions and cytarabine after CBI sanctions were not significant, so their availability could not be assessed. Also, due to the abnormality of residuals in the raloxifene model after the CBI sanctions, the impact was not assessed. The availability of 9 drugs was reduced: 3 after the banking sanctions; 3 after the CBI sanctions; and 3 showed cumulative reductions after both sanctions. Of these 9 drugs, 6 were only available on the market in imported forms (i.e., no local production). Interferon α_{2b} and cytarabine demonstrated immediate changes and the rest shown gradual changes in availability (Table 3). Four other drugs had reduced availability but the change was not significant.

Discussion

We observed significant changes in the market availability of half the drugs studied. While both sanctions resulted in significant shortages, the CBI sanctions on their own resulted in several additional shortages. Six of the affected drugs were only available as

Figure 1 Availability trends of diabetes and asthma drugs affected during 2008–2013

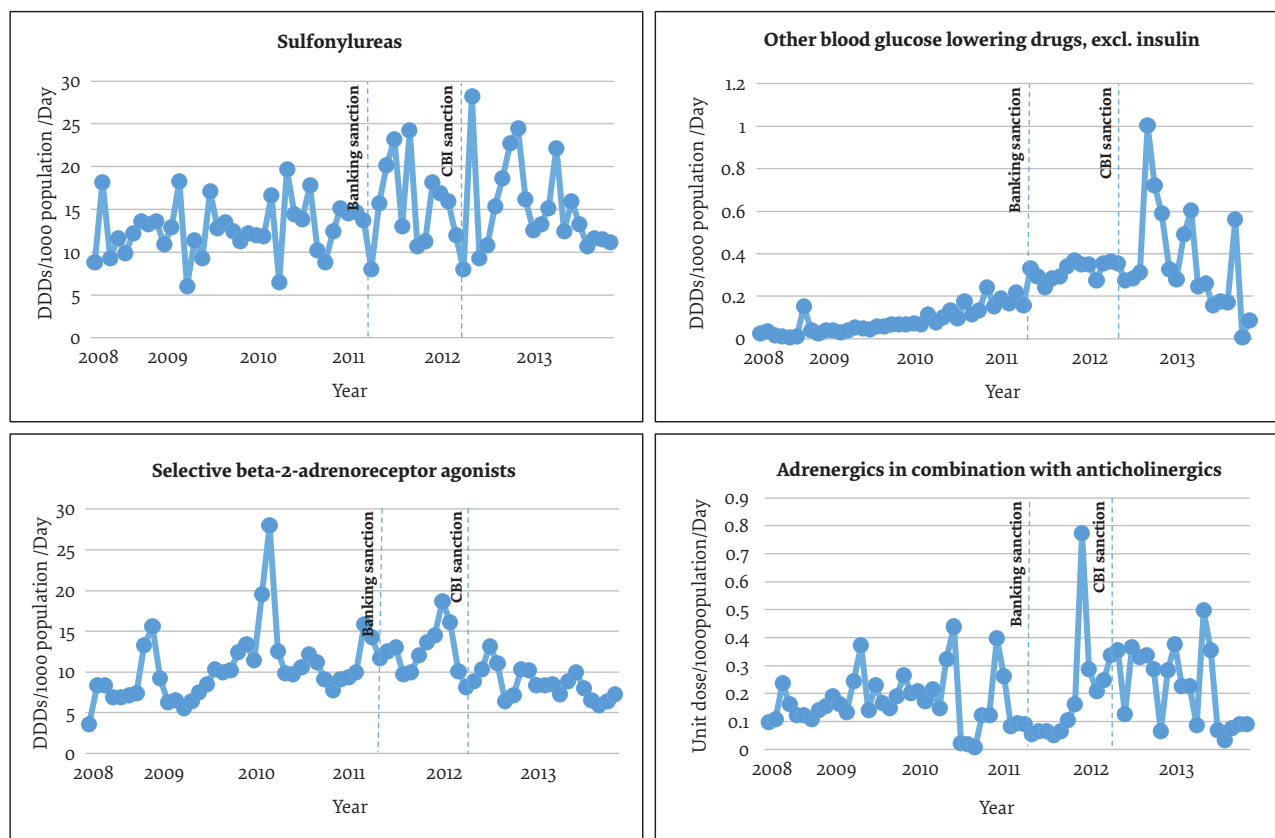


Figure 2 Availability trends of cancer drugs affected during 2008–2013

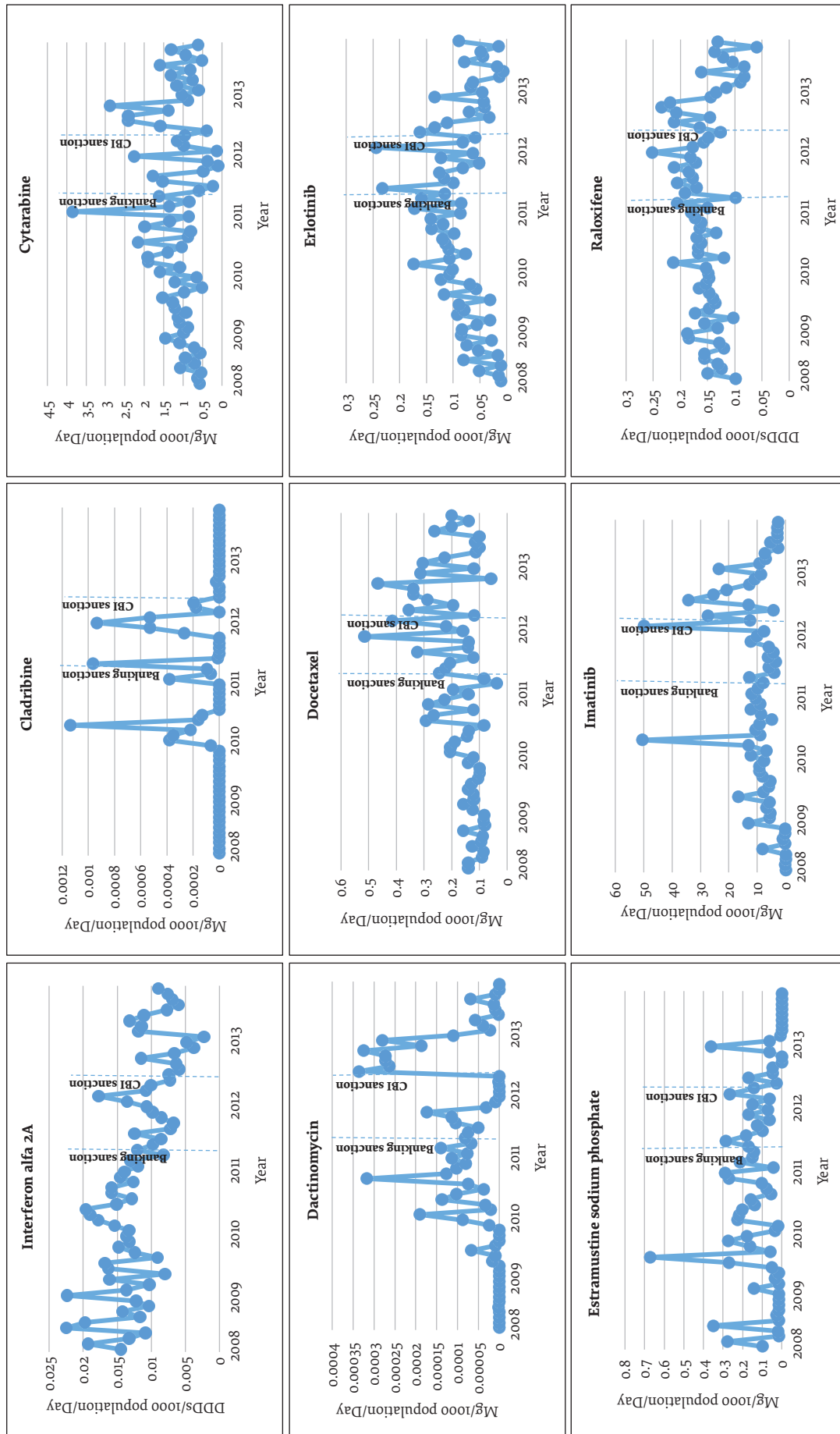


Table 2 Availability of drugs during 2008–2013

Diabetes drugs^a						
	2008	2009	2010	2011	2012	2013
Biguanides	4.659	5.256	10.141	5.457	9.530	14.431
Sulfonylureas	13.482	11.808	21.103	10.952	23.585	11.367
Thiazolidinediones	0.270	0.421	1.405	1.008	1.105	1.453
Glucose lowering drugs, excluding insulin	0.095	0.067	0.376	0.353	0.655	0.048
Insulins and analogues	1.293	1.410	2.996	2.060	2.509	2.749
Asthma drugs						
	2008	2009	2010	2011	2012	2013
Selective β 2-adrenoreceptor agonists ^a	10.342	11.285	8.400	12.829	8.722	6.817
Glucocorticoids ^a	0.416	0.578	0.482	0.648	0.947	0.614
Anticholinergics ^a	0.452	0.542	0.166	0.537	0.505	0.277
Adrenergics with corticosteroids or others, excluding anticholinergics ^b	0.923	0.804	0.953	0.969	1.531	0.798
Adrenergics with anticholinergics ^b	0.124	0.227	0.123	0.132	0.175	0.088
Multiple sclerosis drugs^a						
	2008	2009	2010	2011	2012	2013
Interferon β 1a	0.278	0.241	0.340	0.428	0.490	0.289
Interferon β 1b	0.169	0.044	0.037	0.059	0.045	0.012
Cancer drugs						
	2008	2009	2010	2011	2012	2013
Interferon α 2b ^a	0.013	0.014	0.014	0.008	0.009	0.008
Raloxifene ^a	0.124	0.159	0.163	0.191	0.226	0.095
Tamoxifen ^a	0.279	0.261	0.276	0.307	0.403	0.335
Busereline acetate ^c	0.009	0.005	0.008	0.009	0.007	0.008
Cladribine ^c	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
Cytarabine ^c	0.638	0.744	1.401	0.294	2.131	0.963
Dactinomycin ^c	0.0000	0.0000	0.0001	0.0001	0.0002	0.0000
Docetaxel ^c	0.123	0.098	0.203	0.139	0.262	0.169
Erlotinib ^c	0.064	0.063	0.129	0.067	0.042	0.051
Estramustine sodium phosphate ^c	0.019	0.108	0.088	0.093	0.000	0.000
Fludarabine phosphate ^c	0.019	0.015	0.023	0.002	0.018	0.004
Imatinib ^c	0.513	8.708	10.422	5.185	16.801	2.761
Capecitabine ^c	20.258	40.166	39.672	43.841	10.987	6.463
Daunorubicin ^c	0.0293	0.013	0.013	0.012	0.019	0.003

Values denote the average use for October and November of each year.

^aReported values in DIDs.

^bReported values in unit doses per 1000 population per day.

^cReported values in milligrams per 1000 population per day.

Table 3 Immediate and gradual effects of sanctions on diabetic, asthma, multiple sclerosis and cancer groups^a

Diabetes group	Type of supply	Banking sanctions		CBI sanctions	
		Change in level (P)	Change in trend (P)	Change in level (P)	Change in trend (P)
Biguanides	B	2.09 (< 0.01)	0.04 (0.24)	0.64 (0.47)	-0.004 (0.95)
Sulfonylureas	B	3.77 (0.06)	-0.14 (0.16)	2.85 (0.2)	-0.37 (0.02)
Thiazolidinediones	D	0.05 (0.54)	-0.003 (0.44)	-0.06 (0.51)	-0.0009 (0.88)
Other blood glucose lowering drugs, excluding insulins	B	0.16 (0.08)	-0.007 (0.18)	0.21 (0.01)	-0.02 (< 0.01)
Insulins and analogues	B	0.15 (0.63)	0.02 (0.13)	0.26 (0.47)	0.001 (0.95)

Table 3 Immediate and gradual effects of sanctions on diabetic, asthma, multiple sclerosis and cancer groups^a (concluded)

Asthma group		Type of supply	Banking sanctions		CBI sanctions	
Sample name	(D, I, B)	Change in level (P)	Change in trend (P)	Change in level (P)	Change in trend (P)	Change in trend (P)
Selective β 2-adrenoreceptor agonists	B	0.92 (0.64)	-0.36 (< 0.01)	-1.30 (0.56)	-0.38 (0.02)	
Glucocorticoids	B	0.10 (0.52)	0.01 (0.25)	-0.03 (0.86)	0.009 (0.53)	
Anticholinergics	B	Nonsignificant ITS model	Nonsignificant ITS model	Nonsignificant ITS model	Nonsignificant ITS model	
Adrenergics in combination with corticosteroids or other drugs, excl. anticholinergics	B	3.19 (0.02)	-0.12 (0.11)	-1.54 (0.38)	-0.08 (0.54)	
Adrenergics in combination with anticholinergics	B	Nonsignificant ITS model	Nonsignificant ITS model	0.16 (0.05)	-0.01 (0.04)	
Multiple sclerosis group		Type of supply	Banking sanctions		CBI sanctions	
Sample name	(D, I, B)	Change in level (P)	Change in trend (P)	Change in level (P)	Change in trend (P)	Change in trend (P)
Interferon β 1a	B	-0.03 (0.71)	-0.004 (0.39)	-0.06 (0.57)	-0.005 (0.48)	
Interferon β 1b	I	0.01 (0.57)	-0.0009 (0.43)	0.01 (0.59)	-0.002 (0.19)	
Cancer group		Type of supply	Banking sanctions		CBI sanctions	
Sample name	(D, I, B)	Change in level (P)	Change in trend (P)	Change in level (P)	Change in trend (P)	Change in trend (P)
Interferon α 2b	D	-0.35 (0.03)	0.01 (0.19)	-0.43 (0.02)	0.01 (0.43)	
Busereline acetate	B	-0.48 (0.29)	0.01 (0.44)	0.0002 (0.93)	0.0002 (0.35)	
Cladribine	I	0.0001 (0.39)	-0.0000 (0.01)	-0.0001 (0.25)	-0.0000 (0.15)	
Cytarabine	I	-0.71 (0.02)	-0.02 (0.09)	Nonsignificant ITS model	Nonsignificant ITS model	
Dactinomycin	I	0.0000 (0.94)	-0.0000 (0.14)	1.42 (< 0.01)	-0.09 (< 0.01)	
Docetaxel	I	0.07 (0.10)	-0.004 (0.06)	0.05 (0.24)	-0.01 (0.002)	
Erlotinib	I	0.01 (0.42)	-0.006 (< 0.01)	-0.48 (0.15)	-0.09 (< 0.01)	
Estramustine sodium phosphate	I	0.004 (0.93)	-0.008 (0.002)	-0.01 (0.82)	-0.009 (0.04)	
Fludarabine phosphate	I	-0.005 (0.19)	-0.0003 (0.16)	-0.0003 (0.66)	-0.0003 (0.30)	
Imatinib	B	-4.04 (0.39)	-0.17 (0.48)	6.32 (0.24)	-0.90 (0.05)	
Capecitabine	B	1.30 (0.91)	-0.44 (0.49)	22.22 (0.10)	-2.30 (0.08)	
Daunorubicin	I	Nonsignificant ITS model	Nonsignificant ITS model	Nonsignificant ITS model	Nonsignificant ITS model	
Raloxifene	B	0.03 (0.01)	-0.003 (< 0.01)	Abnormality of residuals	Abnormality of residuals	
Tamoxifen	D	-0.04 (0.16)	0.005 (< 0.01)	0.002 (0.93)	0.007 (< 0.01)	

^aResults of ITS analysis of impact of sanctions on diabetes, asthma, multiple sclerosis and selected cancer drugs.

B = both; CBI = Central Bank of Iran; D = domestic; I = imported; ITS = interrupted time series.

imports and not produced by local companies; 1 was produced domestically and there was no imported type on the market; and both domestic and imported types of the other drugs were present. Long-term reduction in drug availability was more frequent than immediate reduction after both sanctions. Iran FDA tried to maintain the drug supply system by implementing immediate and urgent policies, but continuing sanctions and their impacts on different sectors of the country affected availability of drugs in line with their dependency on imports and foreign transactions. Cancer and asthma groups showed the greatest reduction in drug availability. The availability of 10 other drugs was reduced but not significantly, which may have been due to the power of the model.

Our results demonstrated that access to drugs in the Islamic Republic of Iran has been affected by economic

sanctions, and national/international news media have broadcast the problems that patients have in accessing drugs, especially for cancer and asthma (5). Our study backs the claims that economic sanctions and crises have negative impacts on the health sector and particularly on access to drugs, as suggested in previous studies from the Islamic Republic of Iran and other countries (5,8–11).

Economic sanctions have both direct and indirect negative impacts on health systems, which can be exacerbated by weaknesses in management (29). In the pharmaceutical sector, economic sanctions, in addition to influencing the size of the economy, could reveal other weak points, including inadequate supply management system, weaknesses in policy-making and public/private opportunism in drug supply. So, our findings could have been a result of the direct and/or indirect impacts of the

economic sanctions. This is confirmed by the fluctuation in drug availability in the Iranian pharmaceutical market since 2011, which has led to lack of drug supply sustainability. However, some of the shortages could be prevented by appropriate management and applying the right policies. Previous studies have shown that adequate supply chain management can mitigate the negative impacts of sanctions in other countries such as Cuba (30,31).

Several studies have reported drug shortages in the Islamic Republic of Iran during the economic sanctions, and some have discussed patients' problems and lack of access to drugs (16,32–35). It is clear from our study that access to drugs has been affected by the recent economic sanctions in the Islamic Republic of Iran; availability of drugs for some diseases, such as asthma and cancer, has been affected more severely, causing major problems to patients. It seems that the availability of these drugs was reduced dramatically due to their dependency on importing their raw materials or finished products.

Most of the previous studies that have assessed the impact of economic sanctions and crises on the health sector were descriptive. The present study is believed to be the first empirical study using robust research methods to measure the impact of economic sanctions on access to drugs. Time series methods are the strongest models to assess the impact of interventions on nonrandomized samples and this model enabled us to assess both immediate and long-term effects of economic sanctions on access to drugs. There were limitations to our study, including inability of the method to predict the future; the power of the model in some drug samples; and inability to distinguish between real drug shortages from those caused by demand due to market inflammation (i.e., limitation in drug availability due to overpurchasing or overprescribing as a result of concerns over future lack of drugs).

Conclusion

Our study showed that drugs cannot be separated from international economic sanctions and every economic crisis can affect public health and access to health care. It is worth noting that availability of some of the drugs

was not reduced, so policy-makers should consider the whole market to gain an accurate picture. Sanctions and economic hardship affected access to drugs in two ways. First, sanctions may hamper an expected increase in the use of drugs. The use of many drugs has been increasing globally (including the Islamic Republic of Iran) as a result of improvements in access or increase in population needs (e.g., due to ageing). As we used a time-series approach, we were able to measure the likely increasing trends in drug use and the effects of sanctions on it. Second, sanctions may reduce the absolute availability and use of the drugs. Although we found that the impact of economic sanctions on access to drugs did not follow a general pattern, imported drugs and those with imported raw materials were more likely to be affected. Countries should have programmes to fortify their domestic pharmaceutical industry and to support them for production of essential drugs from start to finish, and identify alternative sources of supply in times of need. Appropriate supply chain management can reduce market inflammation, which can exaggerate drug shortages. We recommend assessing the availability of drugs in other therapeutic groups with other models that can predict the future market if economic sanctions continue.

Acknowledgements

The study was supported by the Tehran University of Medical Sciences as part of the PhD study of the first author. We are very grateful to Prof Arash Rashidian for conceiving and designing the research study and the analytical approaches, and supervising the study until 2015. We would like to thank Iran FDA and in particular Dr. F. Peiravian for the provision of access to the required data. We would also like to thank Dr. S. Nikfar at Tehran University of Medical Sciences for her help in analyzing multiple sclerosis therapeutic group data.

Funding: Small Grant from the Tehran University of Medical Sciences.

Competing interests: None declared.

Impact des sanctions économiques sur l'accès aux médicaments pour le traitement des maladies non transmissibles en République islamique d'Iran

Résumé

Contexte : Il est allégué que les sanctions économiques et la crise économique ont affecté négativement l'accès aux médicaments.

Objectif : Évaluer l'impact des sanctions économiques imposées au système bancaire en 2011, et à la Banque centrale en 2012, sur l'accès et sur l'utilisation des médicaments pour le traitement des maladies non transmissibles (MNT).

Méthodes : Une étude des séries chronologiques interrompues a permis d'évaluer les effets des sanctions sur les médicaments contre le diabète (cinq groupes de produits), l'asthme (cinq groupes de produits), le cancer (14 produits) et la sclérose en plaques (deux produits). La liste de médicaments qui se trouvaient sur le marché pharmaceutique en République islamique d'Iran avant 2011 pour chaque MNT sélectionnée, ainsi que les données sur le nombre de ventes par mois associées, ont été extraites des bases de données de référence nationales. Pour les médicaments

anticancéreux, nous avons utilisé une méthode d'échantillonnage aléatoire stratifié par volume, valeur de ventes et source d'approvisionnement (domestique ou importée). Les données ont été analysées sur une base mensuelle entre 2008 et 2013.

Résultats : La disponibilité sur le marché de 13 échantillons sur 26 a été considérablement réduite. Dix autres médicaments ne montraient aucune réduction significative à cet égard. L'utilisation de l'interféron α -2B est passée de 0,014 dose journalière définie (DDD) pour 1000 personnes en 2010 à 0,008 en 2013. La cytarabine a quant à elle chuté de 1,40 milligramme pour 1000 personnes par jour en 2010 à 0,96 en 2013. De la même manière, l'utilisation d'agonistes β -2 adrénergiques sélectifs est passée de 8,4 DDD à 6,8 sur la même période de temps.

Conclusions : Des preuves solides montrent que l'accès aux médicaments a été négativement impacté, en particulier les médicaments qui dépendaient de l'importation de matières premières ou de produits finis.

أثر العقوبات الاقتصادية على الحصول على أدوية الأمراض غير السارية في جمهورية إيران الإسلامية

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الخلاصة

الهدف: يُقال إن العقوبات الاقتصادية والأزمة الاقتصادية يمكن أن تؤثر تأثيراً سلبياً على الحصول على الأدوية. وقد هدفنا من خلال هذه الدراسة إلى تقييم أثر العقوبات الاقتصادية المفروضة على النظام المصرفي في 2011، وعلى البنك المركزي في 2012، فيما يتعلق بالحصول على أدوية الأمراض غير السارية واستخدامها في جمهورية إيران الإسلامية.

طرق البحث: استخدمنا سلسلة زمنية متقطعة لتقييم آثار العقوبات على أدوية مرضى السكري (5 أصناف) والربو (5 أصناف) والسرطان (14 صنفاً) والتصلب المتعدد (صنفان). واستُخدمت قواعد البيانات المرجعية الوطنية لاشتقاق قائمة الأدوية المتوفرة في سوق المستحضرات الصيدلانية بجمهورية إيران الإسلامية قبل عام 2011 لكل من الأمراض غير السارية المختارة وبيانات مبيعاتها الشهرية. وبالنسبة لأدوية السرطان، استخدمنا أسلوب لاختيار العينة عشوائياً طبقاً لحجم المبيعات وقيمتها ومصدر توريدها (محلية أم مستوردة). وتم تحليل البيانات على أساس شهري منذ عام 2008 حتى 2013.

النتائج: لاحظنا انخفاضاً كبيراً في مستوى توافر 13 دواءً في الأسواق من أصل 26 (50٪) في العينة. وتبين أن أدوية السرطان (مثل الإنترفيرون ألفا 2ب؛ والسيترابين) وأدوية الربو (مثل ناهضات المُستقبلات الأدرينالية بيتا-2 الانتقائية) هما الفئتان الأكثر تضرراً من فئات أدوية الأمراض غير السارية. وسجلت 10 أدوية أخرى انخفاضاً غير ذي دلالة من حيث توافرها في الأسواق. وتبين انخفاض استخدام الإنترفيرون ألفا 2ب من 0,014 جرعة يومية محددة لكل 1000 شخص يومياً في عام 2010 إلى 0,008 في عام 2013؛ وانخفاض استخدام السيترابين من 1,40 ملليجرام لكل 1000 شخص يومياً في عام 2010 إلى 0,96 ملليجرام في عام 2013. وبالمثل، انخفض استخدام ناهضات المُستقبلات الأدرينالية بيتا-2 الانتقائية من 8,4 جرعة يومية إلى 6,8 جرعة يومية في نفس الفترة الزمنية.

الاستنتاجات: على الرغم من أن آثار العقوبات على توافر الأدوية لم يثبت أنها تتبع نمطاً عاماً، توجد أدلة قوية بأن العقوبات كان لها أثر سلبي على الحصول على الأدوية. وعلى وجه التحديد، يقع الضرر الأكبر على الأدوية التي تعتمد على استيراد المواد الخام المستخدمة في تركيبها أو على منتجات نهائية. ومن ثم، يمكن الاستنتاج بأن العقوبات الاقتصادية من شأنها أن تحدث أثراً سلبياً على الحصول على الأدوية وصحة السكان.

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Scaling up prevention and control of noncommunicable diseases in the WHO Eastern Mediterranean Region

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Abstract

Surveillance is an essential component in the campaign to prevent and control noncommunicable diseases (NCDs), both globally and in the Eastern Mediterranean Region (EMR). In order to address the increasing burden from these diseases, countries must first evaluate their own systems and see what steps need to be taken to improve preparedness. Therefore, the WHO Regional Office for the Eastern Mediterranean in Cairo, Egypt, conducts country capacity surveys on a regular basis to compare each Member State's NCD provision to the Framework for Action to implement the UN Political Declaration (2011). Ten progress indicators cover governance and planning, reducing risk factors and healthcare provision. Each one is scored for whether a country is fully, partially or not achieving this goal. This review focuses on comparing the Progress Monitor reports for the 22 EMR countries in 2015 and 2017. While the criteria used to assess some of the indicators have been updated over this period, many categories still show strong improvements. However, others still require extensive work if countries are to meet the sustainable development goal of reducing by 25% the number of premature deaths from NCDs by the year 2025.

Citation: Fouad H, Abdel Latif N, Ingram RA, Hammerich A. Scaling up prevention and control of noncommunicable diseases in the WHO Eastern Mediterranean Region. *East Mediterr Health J.* 2018;24(1):52–62. <https://doi.org/10.26719/2018.24.1.52>

Received: 11/01/18; accepted: 05/03/18

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The importance of measuring national progress on prevention and control of noncommunicable diseases

Noncommunicable diseases (NCDs) are now the world's biggest killers (1) and a leading cause of death and disability in the WHO Eastern Mediterranean Region (EMR) (2). The four main NCDs are cardiovascular disease (including heart attacks and stroke), diabetes, cancer and chronic respiratory disease (such as chronic obstructed pulmonary disease and asthma) (1–3). Over half of deaths caused by NCDs are premature, occurring before the age of 70 (2). Such data show that NCDs affect economically productive individuals, which impoverishes families while also placing a considerable burden on health systems and national economies. This can subsequently stifle the potential for socioeconomic development (2–4). In the WHO Eastern Mediterranean Region, NCDs are responsible for around 60% of all deaths, a total of 1.7 million a year (2,3). This figure is expected to increase to more than 3.8 million by 2030 unless major steps are taken to combat this rise (3). The Region also has some of the highest global rates of NCD-related risk factors; namely physical inactivity, tobacco consumption, and high salt, sugar and fat intake (5). Many of the premature deaths and disability caused by NCDs have the potential to be prevented by addressing these key common risk-factors through lifestyle changes and “best buy” interventions. However, achieving this reduction will require sound and committed national, regional and international efforts.

An essential step in tackling the burden of NCDs, both globally and in the EMR, is to first understand and

assess the capacity of individual countries in prevention and control of these diseases. To this end, WHO conducts country capacity surveys on a regular basis since 2000, with the two most recent Progress Monitor publications released in 2015 and September 2017 (6,7). This process of measuring and updating countries periodically on progress aims to identify their individual strengths and weaknesses. The results allow countries to devise distinct plans to scale up implementation of NCD control policies and actions by strengthening their capacities and human resources.

This review highlights the progress made in the prevention and control of NCDs among the EMR Member States. Specifically it looks at commitments made by countries to reverse this epidemic, compares progress made by countries between 2015 and 2017 to meet these targets, and discusses recommended action and ways forward for countries to stay true to their commitments.

Commitments made by countries to reverse the NCD epidemic

In 2011, a high-level meeting of the United Nations General Assembly was held to discuss the prevention and control of NCDs. The outcome of this meeting was a political declaration where countries made commitments to take specific actions to address the burden associated with NCDs (8). This was endorsed by EMR Member States in the form of the Regional Framework for Action in 2012 (9). The Regional Framework provides strategic interventions and indicators to assess country progress in the four following areas: governance; prevention and

reduction of risk factors; surveillance, monitoring and evaluation; and health care (Figure 1).

Process and tools for measuring national progress on prevention and control of NCDs

Globally, WHO measures national progress on the prevention and control of NCDs using 10 progress monitoring indicators (7). In the Eastern Mediterranean Regional Framework, these indicators are divided into four areas: governance; prevention and reduction of risk factors; surveillance, monitoring and evaluation; and health care (9). In 2014, the WHO Regional Office for the Eastern Mediterranean, Cairo, Egypt (EMRO), developed country profiles that utilize a “traffic light” system. This allows EMRO to update countries on progress made in the prevention and control of NCDs on a regular basis. The major source of information in determining achievement of the indicators is the NCD country capacity survey (NCD CCS) carried out by EMRO at regular intervals. Additional data for some sections is also provided by the WHO Global Report on the Tobacco Epidemic and by the Global Survey on Alcohol and Health.

In May 2013, the World Health Assembly endorsed the WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020 (10). The Global Action Plan provides Member States, international partners and WHO with a

road map and menu of policy options. When implemented collectively between 2013 and 2020, this will contribute to progress on 9 global NCD targets to be attained in 2025, including a 25% relative reduction in premature mortality from NCDs by 2025 (10). WHO’s global monitoring framework on NCDs started tracking implementation of the Global Action Plan through monitoring and reporting on the attainment of the 9 global targets against a baseline in 2010 (11). The 9 voluntary global targets (Figure 2) address key NCD risk factors, including tobacco use, salt intake, physical inactivity, high blood pressure and harmful use of alcohol. The WHO Global Action Plan (2013–2020) in its Appendix 3 provides a total of 14 “best buys” or cost-effective, high-impact interventions out of 81 recommended interventions by WHO. The original best buys included banning all forms of tobacco advertising, replacing trans fats with polyunsaturated fats, restricting or banning alcohol advertising, preventing heart attacks and strokes, promoting breastfeeding, implementing public awareness programmes on diet and physical activity, and preventing cervical cancer through screening among other policy options (10). In May 2017 an update to Appendix 3 was endorsed by the Seventieth World Health Assembly. It now reflects the latest WHO recommendations on evidence-based cost-effective strategies, comprising a total of 88 interventions, out of which there are a total of 16 “Best buys” – those considered as most effective and feasible for implementation (12).


 World Health Organization Regional Office for the Eastern Mediterranean		
Framework for action to implement the United Nations Political Declaration on Noncommunicable Diseases, including indicators to assess country progress by 2018 Updated October 2015, based on resolutions EM/RC59/R.2 & EM/RC60/R.4		
Commitments	Strategic interventions	Progress indicators
In the area of governance	Each country is expected to: <ul style="list-style-type: none"> Integrate noncommunicable diseases into national policies and development plans Establish a multisectoral strategy/plan and a set of national targets and indicators for 2025 based on national situation and WHO guidance Increase budgetary allocations for noncommunicable diseases prevention and control including through innovative financing mechanisms such as taxation of tobacco, alcohol and other unhealthy products Periodically assess national capacity for prevention and control of noncommunicable diseases using WHO tools 	Country has: <ul style="list-style-type: none"> An operational multisectoral national strategy/action plan that integrates the major NCDs and their shared risk factors Set time-bound national targets and indicators based on WHO guidance
In the area of prevention and reduction of risk factors	Each country is expected to: <ul style="list-style-type: none"> Accelerate implementation of the WHO Framework Convention on Tobacco Control (WHO FCTC) and ratify Protocol to Eliminate Illicit Trade in Tobacco Products Ensure healthy nutrition in early life and childhood including breastfeeding promotion and regulating marketing of foods and non-alcoholic beverages to children Reduce average population salt intake in line with WHO recommendations Virtually eliminate transfat intake and reduce intake of saturated fatty acids Promote physical activity through a life-course approach Implement the best buys to reduce the harmful use of alcohol 	Country is implementing: <ul style="list-style-type: none"> Four demand-reduction measures of the WHO FCTC at the highest level of achievement Four measures to reduce unhealthy diet At least one recent national public awareness programme on diet and/or physical activity As appropriate, according to national circumstances, three measures to reduce the harmful use of alcohol, in line with the WHO global strategy to reduce the harmful use of alcohol
In the area of surveillance, monitoring and evaluation	Each country is expected to: <ul style="list-style-type: none"> Implement/strengthen the WHO surveillance framework that monitors mortality and morbidity, risk factors and determinants, and health system capacity and response Integrate the three components of the surveillance framework into the national health information system Strengthen human resources and institutional capacity for surveillance, monitoring and evaluation 	Country has: <ul style="list-style-type: none"> A functioning system for generating reliable cause-specific mortality data on a routine basis A STEPS survey or a comprehensive health examination survey every 5 years
In the area of health care	Each country is expected to: <ul style="list-style-type: none"> Implement the best buys in health care Improve access to early detection and management of major noncommunicable diseases and risk factors by including them in the essential primary health care package Improve access to safe, affordable and quality essential medicines and technologies for major noncommunicable diseases Improve access to essential palliative care services 	Country has: <ul style="list-style-type: none"> Evidence-based national guidelines/protocols/standards for management of major noncommunicable diseases through a primary care approach, recognized/approved by the government or competent authority Provision of drug therapy, including glycaemic control, and counselling for eligible persons at high risk to prevent heart attacks and strokes, with an emphasis on the primary care level

Figure 1 Framework for Action to Implement the UN Political Declaration, developed by the WHO Eastern Mediterranean Regional Office and endorsed by Member States (9)



Figure 2 The nine voluntary global targets to be attained by 2025, including a 25% relative reduction in premature mortality from NCDs by 2025

In 2015, WHO Member States set their national targets and began measuring their progress on the 2010 baseline reported in the WHO Global Status Report on Noncommunicable Diseases 2014 (13). In 2014, an outcome document was produced by the UN High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases, where countries agreed to achieve four time-bound commitments in 2015 and 2016 (14) (Table 1). As a result, WHO developed a set of 10 progress indicators to facilitate monitoring these commitments and updating countries on progress made in implementation (15). These indicators were further updated in September 2017 to ensure consistency with the updated WHO “best buys” (16). They were then used in a WHO report submitted to the UN General Assembly at the end of 2017 in preparation for a comprehensive review of progress by the General Assembly in 2018. The results of the 2017 country capacity survey have also been visualized into the traffic lights system, and will inform progress made in the Region based on these 10 progress indicators.

Key findings of the WHO NCD Country Capacity Survey: comparison between 2015 and 2017

The WHO NCD Country Capacity Survey (NCD-CCS) collects information using a structured evaluation

of the national efforts to prevent and control NCDs. Categories are aligned with the 10 progress monitoring indicators that are also used for other publications with WHO. Additional data is obtained from WHO Global reports on the tobacco epidemic and Alcohol and health. The NCD-CCS was conducted in 2000, 2005, 2010, 2013, 2015 and 2017. The Regional Office visualized the results of the survey using the “traffic light” system to facilitate reporting to countries on progress made thus far in the prevention and control of NCDs, identifying areas where implementation is lagging, and making recommendations on moving forward to meet global and regional commitments.

This review focuses on comparing the 10 progress indicators that were evaluated in the 22 EMR Member States in 2015 and 2017 (Table 1). One Member State did not complete the NCD-CCS in 2015 but was included in 2017. While indicators 1, 4, 5b, 5d, 6a-c, 7b, 7c, and 10 remained the same in both surveys, some refinements were made to other categories including rewording and the addition of extra sub-indicators. The criteria used to assess attainment of each indicator were also altered in some cases in the 2017 NCD-CCS when compared to 2015 to include additional validation. These methodological disparities lead to some limitations in comparing data between the two years. However, this analysis still provides a useful measure of overall progress in the region over the recent period.

Table 1 Time-bound commitments included in the 2014 Outcome Document and resulting indicators used for the Progress Monitor of 2017 (16).

Time-bound commitments included in the 2014 Outcome Document	Ten indicators used by the Director-General to report, by the end of 2017, to the United Nations General Assembly on the progress achieved in the implementation of the time-bound commitments included in the 2014 Outcome Document
Consider setting national targets for 2025 and process indicators based on national situations, taking into account the nine voluntary global targets for NCDs, building on guidance provided by WHO, to focus on efforts to address the impacts of NCDs and to assess the progress made in the prevention and control of NCDs and their risk factors and determinants.	<ol style="list-style-type: none"> 1. Member State has set time-bound national targets based on WHO guidance. 2. Member State has a functioning system for generating reliable cause-specific mortality data on a routine basis. 3. Member State has a STEPS survey or a comprehensive health examination survey every 5 years.
Consider developing or strengthening national multisectoral policies and plans to achieve the national targets by 2025, taking into account the WHO Global NCD Action Plan 2013–2020.	<ol style="list-style-type: none"> 4. Member State has an operational multisectoral national strategy/ action plan that integrates the major NCDs and their shared risk factors.
As appropriate, reduce risk factors for NCDs and underlying social determinants through the implementation of interventions and policy options to create health promoting environments, building on guidance set out in Appendix 3 to the WHO Global NCD Action Plan 2013–2020.	<ol style="list-style-type: none"> 5. Member State has implemented the following four demand-reduction measures of the WHO FCTC at the highest level of achievement: <ol style="list-style-type: none"> a. reduce affordability by increasing excise taxes and prices on tobacco products; b. Eliminate exposure to second-hand tobacco smoke in all indoor workplaces, public places and public transport; c. Implement plain/standardized packaging and/or large graphic health warnings on all tobacco packages; d. Enact and enforce comprehensive bans on tobacco advertising, promotion and sponsorship; e. Implement effective mass media campaigns that educate the public about the harm of smoking/tobacco use and second-hand tobacco smoke. 6. Member State has implemented, as appropriate according to national circumstances, the following three measures to reduce the harmful use of alcohol as per the WHO Global Strategy to Reduce the Harmful Use of Alcohol: <ol style="list-style-type: none"> a. Enact and enforce restrictions on the physical availability of retailed alcohol (via reduced hours of sale); b. Enact and enforce bans or comprehensive restrictions on exposure to alcohol advertising (across multiple types of media); c. Increase excise taxes on alcoholic beverages. 7. Member State has implemented the following four measures to reduce unhealthy diets: <ol style="list-style-type: none"> a. adopt national policies to reduce population salt/sodium consumption; b. adopt national policies that limit saturated fatty acids and virtually eliminate industrially produced trans fatty acids in the food supply; c. WHO set of recommendations on marketing of foods and non-alcoholic beverages to children; d. legislation /regulations fully implementing the International Code of Marketing of Breast-milk Substitutes. 8. Member State has implemented at least one recent national public awareness programme and motivational communication for physical activity behavioural change.
As appropriate, strengthen and orient health systems to address the prevention and control of NCDs and the underlying social determinants through people-centred primary health care and universal health coverage throughout the life cycle, building on guidance set out in Appendix 3 to the WHO Global NCD Action Plan 2013–2020.	<ol style="list-style-type: none"> 9. Member State has evidence-based national guidelines/protocols/ standards for the management of major NCDs through a primary care approach, recognized/approved by government or competent authorities. 10. Member State has provision of drug therapy, including glycemic control, and counselling for eligible persons at high risk to prevent heart attacks and strokes, with emphasis on the primary care level.

One area of notable improvement was in the governance of NCDs. Between 2015 and 2017, the number of Member States that had set time-bound national targets based on WHO guidance increased from only 3 (14%) out of 22 countries to 12 (55%) (Figure 3). In 2015, only one country in the Region had an operational multisectoral national strategy/action plan that integrates the major NCDs and their shared risk factors. By 2017, eight Member States (36%) had fully achieved this indicator. A further five Member States had partially achieved it and thus, showed their firm commitment to implementing this action in the future.

By comparison, the national surveillance of NCDs still requires development. Currently no EMR Member States have fulfilled the criteria towards having a fully functioning system for routinely generating reliable cause-specific data, although more than half (14) are working towards this target. The number conducting STEPS surveys at least every 5 years only improved slightly from two to three countries between 2015 and 2017. Clearly this is an area on which to focus in the future.

Prevention of NCDs is focused upon through reduction of the four main contributing risk factors. The work of the WHO Framework Convention for Tobacco

Control (FCTC) is assessed with a number of indicators in the Progress Monitor (Figure 3). Member States' progress in this area was mixed; on some indicators there was no improvement in the number fully achieving the target. However, encouraging increases were seen in the number of Member States comprehensively banning tobacco advertising, promotion and sponsorship, from six (27%) in 2015 to nine countries (41%) in 2017. A newly introduced indicator for 2017 required countries to implement mass media campaigns to educate the public about the comprehensive health risks of tobacco. By the time of the 2017 survey, three out of 22 countries in the Region (14%) had fully achieved this target (Figure 3) and another six had partially achieved its implementation.

Nearly half of the Member States have implemented alcohol harm reduction measures to reduce the availability and promotion of alcohol and increase its cost as per the WHO Global Strategy. Eleven (50%) countries enacted and enforced restrictions on the physical availability of retailed alcohol, 12 (55%) enacted and enforced bans or comprehensive restrictions on exposure to alcohol advertising (across multiple types of media) and nine countries (41%) increased excise taxes on alcoholic beverages (Figure 3).

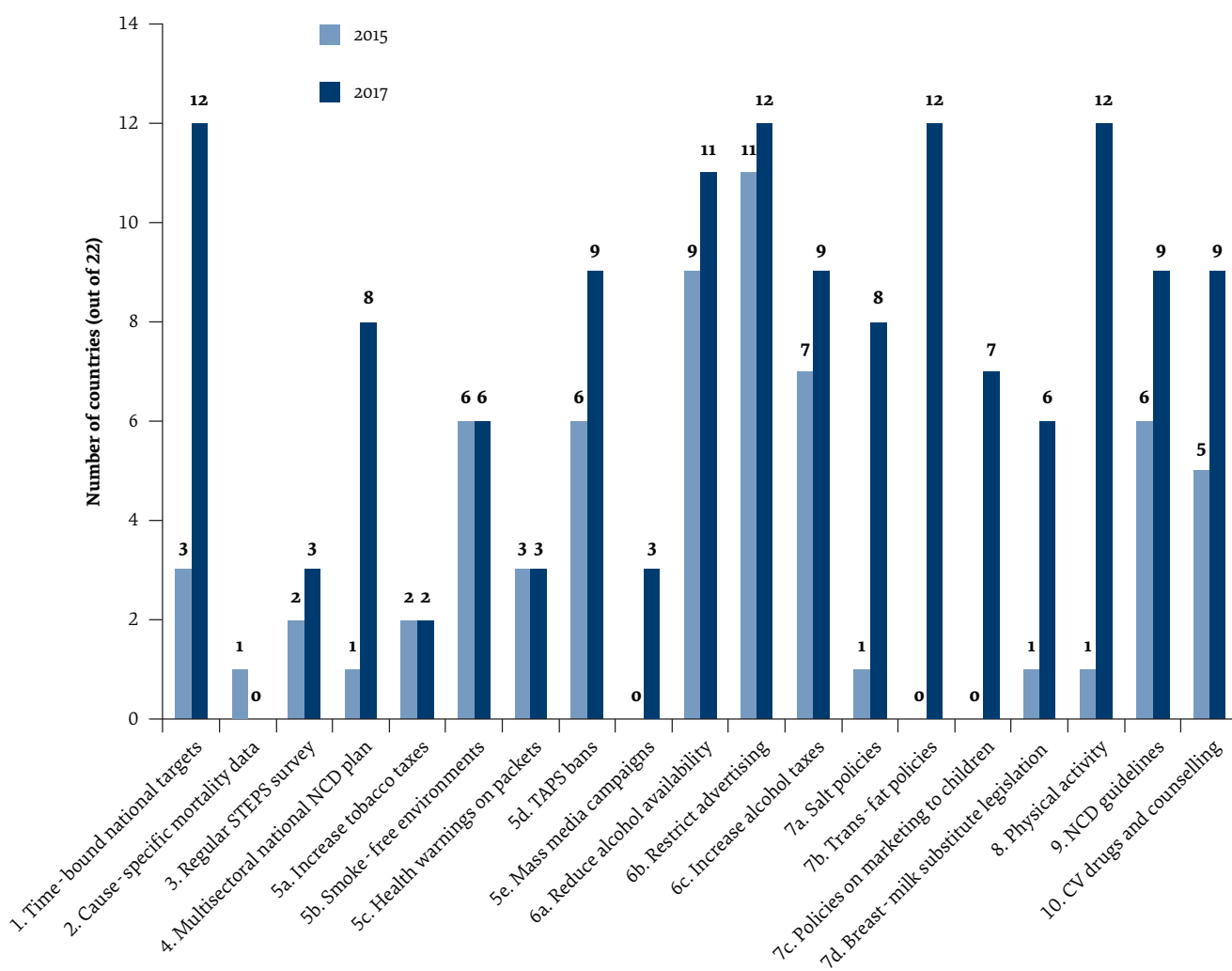


Figure 3 Regional progress on 10 indicators between 2015 and 2017

The progress monitor assesses the implementation of four measures to reduce unhealthy diets. In 2017, eight countries adopted national policies to reduce population salt/sodium consumption. Twelve (55%) out of the 22 Member States adopted national policies that limit saturated fatty acids and virtually eliminate industrially produced trans-fatty acids in the food supply. Nearly one third of Member States (7/22) reported implementing policies to reduce marketing of foods and non-alcoholic beverages to children. Increasing breast-feeding rates is one of the WHO “best buy” interventions. Six (27%) of the Member States have legislation/regulations fully implementing the International Code of Marketing of Breast-milk Substitutes. Twelve (55%) (12/22) of the countries reported the implementation of at least one recent national public awareness and motivational communication for physical activity, including mass media campaigns for physical activity behavioural. These results show a great degree of progress in the areas of nutrition and physical activity since 2015 when no EMR country fully achieved a single one of these indicators (Figure 3).

Finally, in the areas of health care and medication (Figure 3), between 2015 and 2017 the number of EMR countries that have evidence-based national guidelines/protocols/standards for the management of major NCDs through a primary care approach increased from six to nine. Meanwhile 9 (41%) of the countries have provision of drug therapy, including glycaemic control,

and counselling for eligible persons at high risk to prevent heart attacks and strokes, with emphasis on the primary care level in 2017 compared to five countries in 2015. An overall view of these results demonstrates that considerable progress has been made in the Region across a wide range of progress indicators (Figure 4). Certain areas still require much improvement but the continued surveying of these targets will help Member States to focus on these commitments in order to control and prevent NCDs in the Region.

Discussion

Noncommunicable diseases threaten more than health and are a major challenge for development at global and regional levels. In the 2030 Agenda for Sustainable Development (adopted September 2015), countries recognized NCDs as a leading issue for sustainable development (17). The main responsibility for preventing and controlling NCDs lies with governments and requires that all sectors work together. This was highlighted in the 2011 UN Political Declaration, which called for a whole-of-government and whole-of-society approach to address the global and regional burden of NCDs and their related risk factors (11). In spite of the many declarations of political will to tackle the challenge of NCDs, the limited progress in some areas shows that barriers remain to converting intentions into actions. An honest and open exploration of these obstacles is vital to allow the scaling

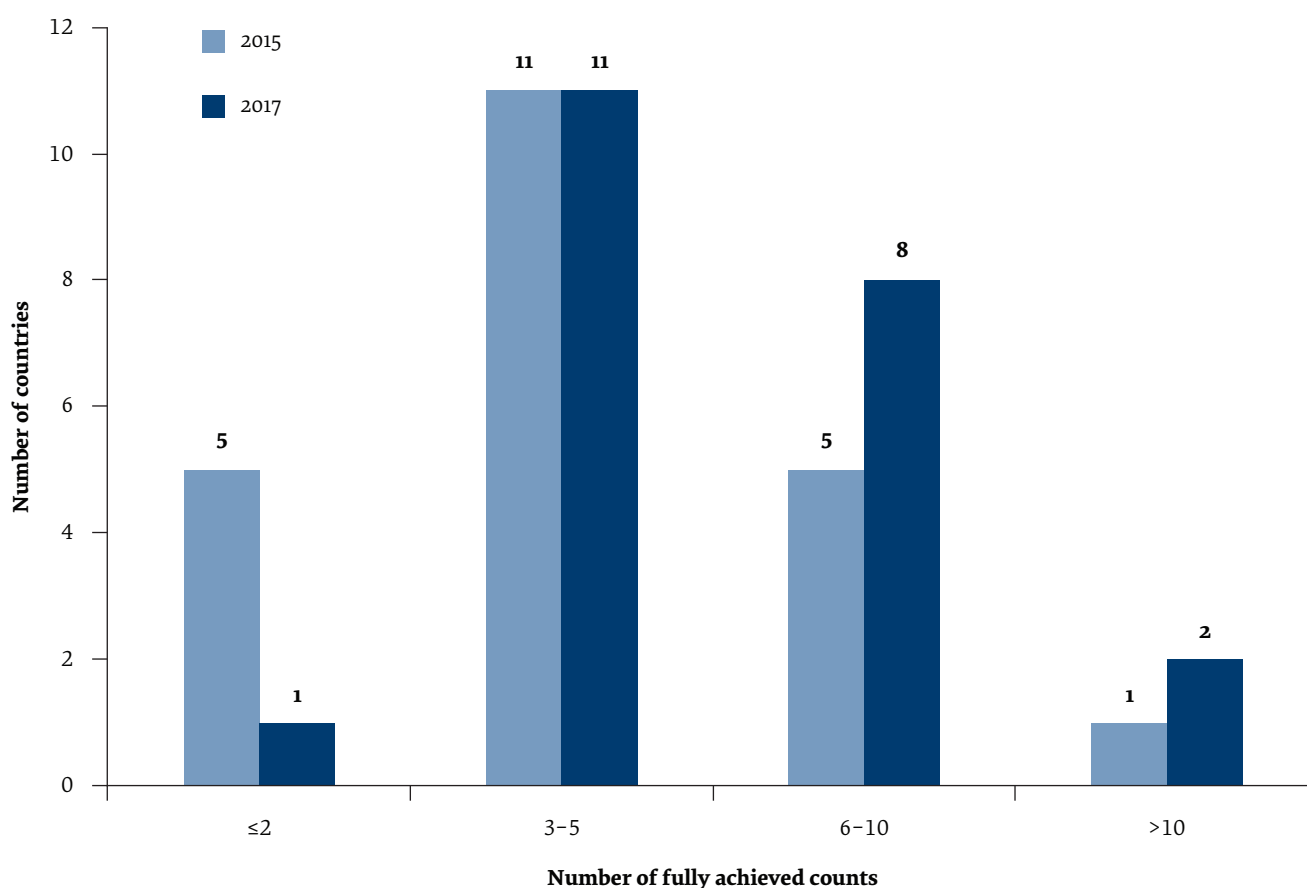


Figure 4 Summary of number of fully achieved indicators

up of NCD prevention and control in the Region.

Maintaining momentum after the initial political statements is a major challenge that can only be achieved by ensuring the commitment of policy-makers at the highest level of government. These key decision-makers can then ensure the engagement of not only the health sector but also stakeholders from other sectors who can realize the necessary changes. This group includes (but is not limited to) agriculture, communication, education, environment, finance, housing, transport, social/welfare and urban planning. So far, only limited progress has been made in engaging these other areas of government, thus hindering the multisectoral management of NCDs necessary to curb their burden. Another vital player in this arena is the commercial sector, which has the power to make significant changes to their products for health promotion purposes if correctly motivated. Many in the business community have declared, and in some cases demonstrated, the desire to aid public health. However, there is not currently an independent mechanism for assessing the implementation and impact of these commitments.

Enacting NCD control programmes requires a significant financial investment from international, regional and national organizations. The economic case for this action is clear in the long term, but in the short term allocating the necessary funds is a challenge, especially for the many low- and middle-income countries in the Region that are facing a steep increase in the prevalence and burden of NCDs. These countries in particular need, and frequently request, technical assistance from organizations such as WHO to help them develop and re-orientate their health services in an evidence-based manner in order to efficiently combat the full range of NCDs. Investing in the “best buy” interventions recommended by WHO provides a good starting point for these changes.

The EMR countries have stated that they are committed to addressing NCDs (9). The WHO country capacity surveys of 2015 and 2017 show that change is possible, even though more action is still needed for countries to meet their time-bound commitments. Areas requiring specific attention include setting national targets and implementing operational integrated policies/strategies/action plans, the development of multisectoral action plans; the periodic as well as routine assessment of NCD risk factors; the effective implementation of the “best buys”; and the strengthening of existing regional health care systems’ capacities to prevent and control NCDs. WHO is working in close collaboration with countries, using the Regional Framework for Action and

the “traffic lights” system, to support them in achieving the outcomes laid out in the UN Political Declaration and 2014 Outcome documents.

The way forward

Countries of the Region need to renew their commitments and identify those NCD champions that will aggressively push the agenda forward. A sense of urgency must be created with focus placed on four main areas for improvement. NCD prevention and control requires the involvement of multiple stakeholders and therefore multisectoral action plans. Efforts to improve stewardship and advocacy among governments, the private sector, civil society and industry (if collectively and harmoniously working together) will improve progress. Lack of coordination among sectors is costly and ineffective; working together will yield more powerful results.

Innovative solutions in both financing and policy processes are required. Implementing inclusive, integrated approaches coupled with innovative financing mechanisms gather the various NCDs under one strategy as well as supporting new developments at country level. Sound decision-making in NCD prevention and control requires up-to-date and reliable information. Integrating sustainable NCD surveillance systems (that focus on the three pillars of outcome, risk factors and national system response) into national health information systems allows for continuous monitoring and evaluation of countries’ progress. Based on the evidence provided by such systems, countries can effectively enforce planning.

Finally, health systems need to be strategically re-orientated to integrate NCD management into people-centered primary health care. Current health care provision in the Region is often vertically organized into separate disease areas, which do not account for the multiple risk factors and co-morbidities at play in NCDs. The family practice model allows practitioners to develop a holistic view of each patient which enables early detection and management of NCDs. According to the findings of the WHO country capacity surveys, countries need to focus upon stronger leadership and planning in order to tackle the burden of NCDs. The 2011 United Nations Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of NCD represents solid proof that with a strong political will and commitment, change is possible.

Funding: None.

Competing interests: None declared.

Intensifier la prévention et la maîtrise des maladies non transmissibles dans la Région OMS de la Méditerranée orientale

Résumé

La surveillance est une composante essentielle des efforts de prévention et de maîtrise des maladies non transmissibles (MNT), tant dans le monde que dans la Région de la Méditerranée orientale. Afin de s'attaquer à la charge croissante de ces maladies, les pays doivent au préalable évaluer leurs propres systèmes et voir quelles mesures doivent être prises pour améliorer la préparation. Par conséquent, le Bureau régional de l'OMS pour la Méditerranée orientale au Caire (Égypte) entreprend régulièrement des enquêtes sur les capacités des pays afin de comparer les dispositions prises par chaque État Membre par rapport au Cadre d'action pour la mise en œuvre de la Déclaration politique des Nations Unies (2011). Dix indicateurs de progrès couvrent la gouvernance et la planification, la réduction des facteurs de risque et la prestation de soins de santé. Chacune de ces catégories se voit attribuer un score permettant de savoir si un pays réalise cet objectif complètement, partiellement ou pas du tout. La présente analyse s'intéresse à la comparaison de rapports de suivi des progrès pour les 22 pays de la Région en 2015 et 2017. Alors que les critères utilisés pour évaluer certains indicateurs ont été mis à jour durant cette période, de nombreuses catégories affichent d'importantes améliorations. Cependant, d'autres catégories nécessitent encore un travail considérable si les pays veulent réaliser l'objectif de développement durable concernant la réduction de 25 % du nombre de décès prématurés dus aux MNT d'ici 2025.

توسيع نطاق الوقاية من الأمراض غير السارية والسيطرة عليها في إقليم شرق المتوسط لمنظمة الصحة العالمية

هبة فؤاد، نسرین عبد اللطيف، راشيل إنجرام، أزمس هاميرش

الخلاصة

يمثل الرصد عنصراً أساسياً في الحملة الرامية إلى الوقاية من الأمراض غير السارية والسيطرة عليها، سواءً على المستوى العالمي أو في إقليم شرق المتوسط. ويستلزم التصدي لزيادة العبء المتراكم من هذه الأمراض أن تطلع البلدان أولاً بتقييم أنظمتها وتحديد الخطوات اللازمة لتأهّبها. ومن ثم، يُجرى مكتب إقليم منظمة الصحة العالمية لشرق المتوسط في القاهرة، مصر، دراسات مسحية على أساس منتظم بشأن قدرات البلدان لمقارنة المساهمات التي يقدمها كل بلد عضو على مستوى مواجهة الأمراض غير السارية في إطار العمل المتعلق بتنفيذ الإعلان السياسي للأمم المتحدة (٢٠١١). وتستخدم في هذه الدراسة عشرة مؤشرات لقياس التقدم المحرز تغطي عناصر الإدارة والتخطيط والحد من عوامل الخطر وتوفير الرعاية الصحية. ويُسجّل كل مقياس على أساس مدى تحقيق البلد المعني لهذا الهدف سواءً بشكل كلي أو جزئي أو عدم تحقيقه على الإطلاق. ويركز هذا الاستعراض على مقارنة تقارير رصد التقدم المحرز في بلدان الإقليم البالغ عددها ٢٢ بلداً خلال عامي ٢٠١٥ و٢٠١٧. علماً بأنه قد أُجريت تحسينات كبيرة في كثير من الفئات خلال هذه الفترة الزمنية. إلا أن ثمة فئات أخرى تحتاج إلى مزيد من العمل حتى يتسنى للبلدان تحقيق هدف التنمية المستدامة المتمثل في خفض معدل الوفيات المبكرة الناجمة عن الأمراض غير السارية بمقدار ٢٥٪ بحلول عام ٢٠٢٥.

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Supplementary table 1 Full comparison of progress made by countries in prevention and control of NCDs between 2015 and 2017

Progress indicators	2015						2017					
	Fully Achieved		Partially Achieved		Not Achieved		Fully Achieved		Partially Achieved		Not Achieved	
	N	%	N	%	N	%	N	%	N	%	N	%
1. Member State has set time-bound national targets based on WHO guidance	3	14	4	18	14	64	12	55	1	5	9	41
2. Member State has a functioning system for generating reliable cause-specific mortality data on a routine basis	1	5	12	55	8	36	0	0	14	64	8	36
3. Member State has a STEPS survey or a comprehensive health examination survey every 5 years	2	9	15	68	4	18	3	14	15	68	4	18
4. Member State has an operational multisectoral national strategy/action plan that integrates the major NCDs and their shared risk factors	1	5	7	32	13	59	8	36	5	23	9	41
5a. Reduce affordability by increasing excise taxes and prices on tobacco products	2	9	4	18	14	64	2	9	8	36	12	55
5b. Eliminate exposure to second-hand tobacco smoke in all indoor workplaces, public places and public transport	6	27	10	45	6	27	6	27	10	45	6	27
5c. Implement plain/standardized packaging and/or large graphic health warnings on all tobacco packages	3	14	11	50	8	36	3	14	13	59	6	27
5d. Enact and enforce comprehensive bans on tobacco advertising, promotion and sponsorship	6	27	13	59	3	14	9	41	12	55	1	5
5e. Implement effective mass media campaigns that educate the public about the harms of smoking/tobacco use and second hand smoke*							3	14	6	30	11	55
6a. Enact and enforce restrictions on the physical availability of retailed alcohol (via reduced hours of sale)	9	41	5	23	0	0	11	50	6	27	0	0
6b. Enact and enforce bans or comprehensive restrictions on exposure to alcohol advertising (across multiple types of media)	11	50	3	14	0	0	12	55	2	9	3	14
6c. Increase excise taxes on alcoholic beverages	7	32	5	23	2	9	9	41	6	27	2	9
7a. Adopted national policies to reduce population salt/sodium consumption	1	5	0	0	7	32	8	36	6	27	8	36
7b. Adopted national policies that limit saturated fatty acids and virtually eliminate industrially produced trans fatty acids in the food supply	0	0	0	0	6	27	12	55	0	0	10	45
7c. WHO set of recommendations on marketing of foods and non-alcoholic beverages to children	0	0	0	0	5	23	7	32	0	0	14	64
7d. Legislation/regulations fully implementing the International Code of Marketing of Breast-milk Substitutes	1	5	0	0	8	36	6	27	12	55	3	14
8. Member State has implemented at least one recent national public awareness and motivational communication for physical activity, including mass media campaigns for physical activity behavioural change	1	5	0	0	10	45	12	55	0	0	9	41
9. Member State has evidence-based national guidelines/protocols/standards for the management of major NCDs through a primary care approach, recognized/approved	6	27	5	23	7	32	9	41	7	32	4	18
10. Member State has provision of drug therapy, including glycaemic control, and counselling for eligible persons at high risk to prevent heart attacks and strokes, with emphasis on the primary care level	5	23	2	9	11	50	9	41	1	5	12	55

(*Newly introduced indicator based on the recent update made in the Appendix 3 of the Global Action Plan(WHO/WHA, 2017)

Supplementary table 2 Overall summary of progress indicator achievement in the Eastern Mediterranean Region 2017 (22 countries)

Progress indicator number	Progress indicator	Number and percentage of countries partially achieving indicator		Countries partially achieving indicator	Number and percentage of countries fully achieving indicator		Countries fully achieving indicator
1	Member State has set time-bound national targets based on WHO guidance	1	4.5	Jordan	12	54.5	Bahrain-Egypt-Islamic Republic of Iran-Iraq- Kuwait-Morocco-Oman-Qatar-Saudi Arabia-Sudan-United Arab Emirates-Palestine
2	Member State has a functioning system for generating reliable cause-specific mortality data on a routine basis	14	63.6	Bahrain-Egypt-Islamic Republic of Iran-Iraq-Jordan-Kuwait-Morocco-Oman-Qatar-Saudi Arabia-Syrian Arab Republic-Tunisia-United Arab Emirates-Palestine	0	0.0	
3	Member State has a STEPS survey or a comprehensive health examination survey every 5 years	15	68.2	Afghanistan-Bahrain-Egypt-Iraq-Jordan-Kuwait-Lebanon-Libya-Morocco-Oman-Pakistan-Qatar-Tunisia-United Arab Emirates-Palestine	3	13.6	Islamic Republic of Iran-Saudi Arabia-Sudan
4	Member State has an operational multisectoral national strategy/action plan that integrates the major NCDs and their shared risk factors	5	22.7	Egypt-Jordan-Lebanon-Morocco-Palestine	8	36.4	Afghanistan-Islamic Republic of Iran-Kuwait-Saudi Arabia -Bahrain-Iraq-United Arab Emirates-Qatar
5	Member State has implemented the following four demand-reduction measures of the WHO FCTC at the highest level of achievement:						
	a. Reduce affordability by increasing excise taxes and prices on tobacco products	8	36.4	Egypt-Iraq-Morocco-Pakistan-Sudan-Syrian Arab Republic Tunisia-Yemen	2	9.1	Jordan-Palestine
	b. Eliminate exposure to second-hand tobacco smoke in all indoor workplaces, public places and public transport	10	45.5	Djibouti-Egypt-Iraq-Jordan-Kuwait-Morocco-Saudi Arabia-Syrian Arab Republic-United Arab Emirates-Yemen	6	27.3	Afghanistan-Islamic Republic of Iran-Lebanon-Libya-Pakistan-Palestine
	c. Implement plain/standardized packaging and/or large graphic health warnings on all tobacco packages	13	59.1	Afghanistan-Bahrain-Iraq-Jordan-Kuwait-Lebanon-Oman-Pakistan-Qatar-Saudi Arabia-Tunisia-United Arab Emirates-Yemen	3	13.6	Djibouti-Egypt-Islamic Republic of Iran
	d. Enact and enforce comprehensive bans on tobacco advertising, promotion and sponsorship	12	54.5	Egypt-Iraq-Jordan Lebanon-Morocco-Oman-Pakistan Saudi Arabia-Sudan-Syrian Arab Republic-Tunisia-Palestine	9	40.9	Afghanistan-Bahrain-Djibouti-Islamic Republic of Iran-Kuwait-Libya-Qatar-United Arab Emirates-Yemen
	e. Implement effective mass media campaigns that educate the public about the harms of tobacco use and second hand smoke	6	27.3	Bahrain-Islamic Republic of Iran-Iraq-Saudi Arabia-Tunisia-United Arab Emirates	3	13.6	Jordan-Morocco-Pakistan
6	Member State has implemented, as appropriate according to national circumstances, the following three measures to reduce the harmful use of alcohol as per the WHO Global Strategy to Reduce the Harmful Use of Alcohol:						
	a. Enact and enforce restrictions on the physical availability of retailed alcohol (via reduced hours of sale)	6	27.3	Djibouti-Jordan-Lebanon-Morocco-Pakistan-Palestine	11	50.0	Afghanistan-Egypt-Iran-Iraq-Libya-Oman-Saudi Arabia -Somalia-Sudan-Syrian Arab Republic-Yemen

Supplementary table 2 Overall summary of progress indicator achievement in the Eastern Mediterranean Region 2017 (22 countries) (concluded)

Progress indicator number	Progress indicator	Number and percentage of countries partially achieving indicator		Countries partially achieving indicator	Number and percentage of countries fully achieving indicator		Countries fully achieving indicator
	b. Enact and enforce bans or comprehensive restrictions on exposure to alcohol advertising (across multiple types of media)	2	9.1	Iraq-Syrian Arab Republic	12	54.5	Afghanistan-Djibouti-Egypt-Iran-Jordan-Libya-Oman-Pakistan-Saudi Arabia-Somalia-Sudan-Yemen
	c. Increase excise taxes on alcoholic beverages	6	27.3	Egypt-Iraq-Jordan-Lebanon-Oman-Pakistan	9	40.9	Afghanistan-Djibouti-Iran-Libya-Saudi Arabia-Somalia-Sudan-Syrian Arab Republic-Yemen
7	Member State has implemented the following four measures to reduce unhealthy diets:						
	a. Adopted national policies to reduce population salt/sodium consumption	6	27.3	Afghanistan-Bahrain Egypt-Iraq-Kuwait-Qatar	8	36.4	Iran-Jordan-Morocco-Oman-Saudi Arabia-Tunisia-United Arab Emirates-Palestine
	b. Adopted national policies that limit saturated fatty acids and virtually eliminate industrially produced trans fatty acids in the food supply	0	0.0		12	54.5	Afghanistan-Bahrain-Iran-Iraq-Jordan-Kuwait-Morocco-Oman-Qatar-Saudi Arabia-Tunisia-United Arab Emirates
	c. WHO set of recommendations on marketing of foods and non-alcoholic beverages to children	0	0.0		7	31.8	Afghanistan-Bahrain-Iran-Jordan-Qatar-Saudi Arabia-United Arab Emirates
	d. Legislation/regulations fully implementing the International Code of Marketing of Breast-milk Substitutes	12	54.5	Djibouti-Egypt-Iran-Iraq-Jordan-Oman-Qatar Saudi Arabia-Sudan-Syrian Arab Republic-Tunisia-United Arab Emirates	6	27.3	Afghanistan-Bahrain-Kuwait-Lebanon-Pakistan-Yemen
8	Member State has implemented at least one recent national public awareness and motivational communication for physical activity, including mass media campaigns for physical activity behavioural change	0	0.0		12	54.5	Bahrain-Iran-Iraq-Jordan-Kuwait-Lebanon-Morocco-Oman-Qatar-Saudi Arabia-Tunisia-United Arab Emirates
9	Member State has evidence-based national guidelines/protocols/standards for the management of major NCDs through a primary care approach, recognized/approved by government or competent authorities	7	31.8	Egypt-Jordan-Morocco-Pakistan-Syrian Arab Republic-Tunisia-Palestine	9	40.9	Iran-Iraq-Kuwait-Lebanon-Oman-Qatar-Saudi Arabia-Sudan-United Arab Emirates
10	Member State has provision of drug therapy, including glycaemic control, and counselling for eligible persons at high risk to prevent heart attacks and strokes, with emphasis on the primary care level	1	4.5	Syrian Arab Republic	9	40.9	Bahrain-Iran-Jordan-Kuwait-Lebanon-Oman-Saudi Arabia-United Arab Emirates-Palestine

MPOWER, needs and challenges: trends in the implementation of the WHO FCTC in the Eastern Mediterranean Region

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Abstract

Background: WHO MPOWER aims to help countries prioritize tobacco control measures in line with the WHO Framework Convention on Tobacco Control.

Objectives: This paper assessed the progress and challenges in implementing the 6 priority policies of MPOWER in countries of the WHO Eastern Mediterranean Region since 2011.

Methods: A checklist was developed and scores assigned based on the MPOWER indicators (maximum score 37). MPOWER data for the Region in the 2015 and 2017 tobacco control reports were extracted and scored. Data from similar analyses for 2011 and 2013 were also included. Countries were ranked by scores for each indicator for 2015 and 2017 and for overall scores for 2011 to 2017.

Results: The Islamic Republic of Iran, Egypt and Pakistan had the highest scores in 2015 (33, 29 and 27 respectively) and the Islamic Republic of Iran, Pakistan and Yemen had the highest scores in 2017 (34, 31 and 27 respectively). The indicators with the highest and lowest combined score for all countries were for advertising bans and compliance with smoke-free policies: 67 and 18 respectively in 2015, and 73 and 15 respectively in 2017. Most countries (15/22) had higher total scores in 2017 than 2015: Afghanistan, Bahrain and Syrian Arab Republic had the greatest increases. The total score for the Region increased from 416 out of a maximum score of 814 in 2011 to 471 in 2017.

Conclusions: Although notable achievements have been made in the Region, many challenges to policy implementation remain and require urgent action by governments of the countries of the Region.

Keywords: Tobacco; smoking; media; noncommunicable diseases; control

Citation: Heydair G, Zaatari G, Al-Lawati J, El-Awa F, Fouad H. MPOWER, needs and challenges: trends in the implementation of the WHO FCTC in the Eastern Mediterranean Region. *East Mediterr Health J.* 2018;24(1):63–71. <https://doi.org/10.26719/2018.24.1.63>

Received: 22/08/17; accepted: 07/11/17

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Introduction

The WHO Framework Convention on Tobacco Control (WHO FCTC) is the first international treaty to provide new legal dimensions for international health cooperation in combating the global tobacco epidemic (1).

The Eastern Mediterranean Region (EMR) of the World Health Organization (WHO) consists of 22 high-, middle- and low-income countries. Tobacco use is one of the greatest public health challenges facing this Region. Smoking rates among men are high and are projected to increase. Furthermore, EMR is one of two WHO regions with the fastest growing consumption of tobacco products and where the prevalence of use is expected to increase 25% by the year 2025, compared with a decrease in Asia, North America and Europe (2). There is a need, therefore, for comprehensive tobacco control programmes (3,4). A major barrier however to implementing tobacco control programmes worldwide is the tobacco industry, which typically uses its financial power to expand its production, distribution and sale of tobacco products, and to influence policy-makers (2).

In 2008, WHO introduced a package of measures under the acronym of MPOWER with the aim of helping Member States to prioritize tobacco control measures while implementing the various provisions of the WHO FCTC with the ultimate aim of reducing the global morbidity and mortality from tobacco use. This package focuses on 6 evidence-based measures that have been found to have the greatest effect on reducing tobacco consumption, namely: **M**onitoring tobacco use and prevention policies; **P**rotecting people from tobacco smoke; **O**ffering help to quit tobacco use; **W**arning about the dangers of tobacco; **E**nforcing bans on tobacco advertising, promotion and sponsorship; and **R**aising taxes on tobacco (2). Global experience shows that implementation of these measures reduces tobacco consumption and its harmful health effects (5–7).

WHO published 4 reports on the global tobacco epidemic in 2011, 2013, 2015 and 2017, which included data on the activities of the EMR countries in relation to these 6 policies (8–11). Two studies, based on the 2011 and 2013 WHO MPOWER reports, showed different levels of implementations of the 6 elements of

MPOWER (12,13). For example, the lack of adherence to the smoking ban in public places was alarmingly high. The studies also demonstrated the poor compliance of the tobacco industry with tobacco control laws, and the sale of tobacco products is still almost unregulated. This contrasts with the experiences in other WHO regions where implementation has been better than the EMR (14–16).

Lessons can be learned from 10 years of implementing WHO FCTC and the demonstrated benefit in combating noncommunicable diseases (17,18). Cairney and Mamudu (19) report that the best approach to tobacco control in a country requires specific policy processes, namely: the department of health takes the policy lead; tobacco is 'framed' as a public health problem; public health groups are consulted at the expense of tobacco control interests; socioeconomic conditions are conducive to policy change; and the scientific evidence is 'set in stone' within governments. No country can meet all these requirements in a short period and there is a wide gap between the expectations of implementing such programmes and the actual situation in many countries, particularly in the EMR. In 2016 and 2017, 2 studies showed that the WHO FCTC implementation in the Region had not improved greatly over the past 6 years (20,21); countries had failed to adopt stronger and more effective policies; and reinforce the already existing laws.

Our study therefore aimed to compare the performance of EMR countries over time in implementation of MPOWER policies, and discuss some of the challenges

facing the countries in adopting these effective measures.

Methods

This study was conducted during May–September 2017. Published literature, official reports on MPOWER and communications with regional experts in the field of tobacco control were the source of our data. Two researchers searched and summarized the papers and reports, screened studies, extracted data independently and resolved any discrepancies under the supervision of the first author. The checklist was designed previously (12,13) by Iranian and international tobacco control specialists and contained 10 indicators based on the main elements of MPOWER [Monitoring, Smoke-free policies, Cessation programmes, Warnings (health warning on cigarette packets, and mass media campaigns), Advertising bans, and Taxation], and 3 other MPOWER indicators: smoking prevalence, smoke-free policy compliance and advertising ban compliance. The cut-offs were set according to the scoring of the indicators in the 2015 Report on the Global Tobacco Epidemic (8). Seven indicators had 5 options and we assigned a score of 0 up to a maximum of 4; 3 indicators had 4 possible options and were assigned a score of 0 up to a maximum of 3. Higher scores indicate better level of implementation of MPOWER policies. Thus, the maximum possible score was 37 (Table 1). If data were not available for an indicator, it was scored as zero. As with the two previous studies (12,13), two trained assessors conducted the assessment (correlation coefficient between them = 0.8). Data entry was done independently by the first assessor and

Table 1 Matrix used to assess tobacco control in EMR countries based on the 2015 WHO MPOWER report (8)

Indicator	Score
Adult daily smoking prevalence	4
Estimates not available	0
> 30%	1
20–29%	2
15–19%	3
< 15%	4
Monitoring: prevalence data	3
No known or recent data or data that are not both recent and representative	0
Recent and representative data for either adults or adolescents	1
Recent and representative data for both adults and adolescents	2
Recent, representative and periodic data for both adults and adolescents	3
Smoke-free policies (protecting people from second-hand smoke)	4
Data not reported	0
Up to 2 public places completely smoke free	1
3–5 public places completely smoke free	2
6 or 7 public places completely smoke free	3
All public places completely smoke free	4
Cessation programmes	4
Data not reported	0
None	1

Table 1 Matrix used to assess tobacco control in EMR countries based on the 2015 WHO MPOWER report (8) continued

Indicator	Score
Nicotine replacement therapy and/or some cessation services (neither cost-covered)	2
Nicotine replacement therapy and/or some cessation services (≥ 1 of which is cost-covered)	3
National quit line, and both nicotine replacement therapy and some cessation services cost-covered	4
Health warnings (on cigarette packages)	4
Data not reported	0
No warnings or small warnings	1
Medium-size warnings missing some appropriate characteristics	2
Medium-size warnings with all appropriate characteristics	3
Large warnings with all appropriate characteristics	4
Mass media warnings through anti-tobacco campaigns	4
Data not reported	0
No campaign conducted	1
Campaign conducted with 1–4 appropriate characteristics	2
Campaign conducted with 5–6 appropriate characteristics	3
Campaign conducted with all appropriate characteristics	4
Ban on tobacco advertising, promotion and sponsorship	4
Data not reported	0
Complete absence of a ban in print media	1
Ban on national television, radio and print media only	2
Ban on national television, radio and print media as well as on some but not all other forms of direct and/or indirect advertising	3
Ban on all forms of direct and indirect advertising	4
Tax on tobacco products	4
Data not reported	0
$\leq 25\%$ of retail price is tax	1
26–50% of retail price is tax	2
51–75% of retail price is tax	3
$> 75\%$ of retail price is tax	4
Compliance with bans on advertising	3
Complete compliance (8/10 to 10/10)	3
Moderate compliance (3/10 to 7/10)	2
Minimal compliance (0/10 to 2/10)	1
Not reported	0
Compliance with smoke-free policies	3
Complete compliance (8/10 to 10/10)	3
Moderate compliance (3/10 to 7/10)	2
Minimal compliance (0/10 to 2/10)	1
Not reported	0
Total	37

was checked by the second. The principal investigator randomly selected 2 or 3 of the data entered to monitor the ratings.

Results

Countries were ranked by scores for each indicator for 2015 and 2017 as shown in Tables 2 and 3 respectively. The highest scores were attained by Egypt, the Islamic Republic of Iran and Pakistan (scores 33, 29 and 27 respectively) in 2015; and Islamic Republic of Iran,

Pakistan and Yemen (scores 34, 31 and 27 respectively) in 2017, while the score for Somalia was 4 in 2015 and 7 in 2017. Thirteen countries did not report adult daily smoking prevalence in 2015, which had decreased to 8 countries in 2017. The indicators with the highest and lowest combined score for all countries were for advertising bans and compliance with smoke-free policies: 67 and 18 respectively in 2015, and 73 and 15 respectively in 2017. Most countries (15/22) had higher total scores in 2017 than 2015, with the greatest increases seen in

Table 2 Countries of the World Health Organization Eastern Mediterranean Region ranked by total WHO MPOWER score for tobacco control, 2015

Country	Smoking prevalence	Monitoring	Smoke-free policies	Smoke-free policy compliance	Cessation programmes	Health warning on cigarettes packets	Mass media campaigns	Advertising bans	Advertising ban compliance	Taxation	Total scores (2015)
Islamic Republic of Iran	4	3	4	2	4	4	4	4	3	1	33
Egypt	2	3	2	2	3	4	3	4	2	4	29
Pakistan	3	3	4	1	3	3	3	3	1	3	27
Lebanon	2	2	4	1	3	2	4	3	1	2	24
Kuwait	0	3	3	1	4	3	3	3	1	2	23
Saudi Arabia	4	2	4	3	3	3	1	1	1	1	23
Libya	0	2	4	1	3	1	4	4	3	1	23
Yemen	0	2	3	1	2	3	2	4	2	3	22
West Bank and Gaza Strip	0	3	4	1	2	1	2	3	1	4	21
Morocco	3	1	2	2	2	1	1	3	3	3	21
Tunisia	0	1	1	0	3	1	4	3	4	3	20
Djibouti	0	2	3	0	2	4	3	4	0	2	20
Jordan	1	1	2	1	3	2	1	3	1	4	19
Qatar	0	3	1	0	3	3	1	3	3	1	18
United Arab Emirates	0	1	0	0	4	3	3	4	0	1	16
Sudan	0	1	1	0	1	1	3	3	3	3	16
Bahrain	2	0	0	0	3	3	1	4	0	2	15
Oman	4	1	1	0	3	3	1	1	0	1	15
Iraq	0	1	2	1	3	2	1	3	1	1	15
Syrian Arab Republic	0	1	3	0	3	1	1	3	0	0	12
Afghanistan	0	0	2	1	2	1	1	3	1	1	12
Somalia	0	0	1	0	1	1	0	1	0	0	4
Total	25	36	51	18	60	50	47	67	31	43	428

Table 3 Countries of the World Health Organization Eastern Mediterranean ranked by total WHO MPOWER score for tobacco control, 2017

Country	Smoking prevalence	Monitoring	Smoke-free policies	Smoke-free policy compliance	Cessation programmes	Health warning on cigarette packets	Mass media campaigns	Advertising bans	Advertising bans compliance	Taxation	Total scores	Difference from 2015
Islamic Republic of Iran	4	4	4	3	4	4	3	4	3	1	34	+1
Pakistan	3	4	4	1	3	3	4	3	3	3	31	+4
Yemen	4	3	3	1	2	3	1	4	3	3	27	+5
Saudi Arabia	4	3	2	1	3	3	2	3	3	2	26	+3
Egypt	2	4	2	0	3	4	1	3	3	3	25	-4
Lebanon	2	4	4	1	3	2	1	3	2	2	24	0
Jordan	0	2	2	1	3	2	4	3	2	4	23	+4
Morocco	3	2	2	1	2	1	4	3	1	3	22	+1
Djibouti	4	3	3	0	2	4	0	4	0	2	22	+2
Qatar	3	4	1	0	3	3	0	4	3	1	22	+4
Kuwait	3	4	2	0	4	3	1	4	0	1	22	-1
Bahrain	2	2	0	0	3	3	2	4	3	2	21	+6
West Bank and Gaza Strip	0	2	4	1	2	1	1	3	2	4	20	-1
Oman	4	1	1	0	3	3	1	3	3	1	20	+5
Syrian Arab Republic	0	1	3	2	3	1	1	3	3	3	20	+8
United Arab Emirates	2	2	0	0	4	3	3	4	0	1	19	+3
Afghanistan	0	0	4	2	2	3	1	4	3	0	19	+7
Iraq	0	2	2	1	3	2	2	3	1	3	19	+4
Tunisia	2	1	1	0	3	2	3	3	0	3	18	-2
Libya	0	1	4	0	3	1	1	4	3	1	18	-5
Sudan	0	1	2	0	1	1	1	3	0	3	12	-4
Somalia	0	1	1	0	1	1	1	1	0	1	7	+3
Total	42	51	51	15	60	53	38	73	41	47	471	+43

Afghanistan, Bahrain and the Syrian Arab Republic. However, 5 countries had lower scores, including Egypt, Libya and Sudan.

Table 4 shows the total scores for the countries for 2011, 2013, 2015 and 2017. The total score for the Region increased from 416 in 2011 to 471 in 2017. The Islamic Republic of Iran had the highest scores in the 4 years the MPOWER data were analysed. Afghanistan, Lebanon, Pakistan, Saudi Arabia and Yemen showed the biggest increase in their total scores in this time.

Discussion

From our assessment of the implementation of the MPOWER package in EMR countries over a 7-year period, it is clear that the overall implementation of the FCTC in the EMR remains suboptimal. Some countries have improved their scores in tobacco control while others have failed to show substantial improvement. From 2015 to 2017, the scores of Pakistan, Yemen and Saudi Arabia and Yemen increased and they ranked second, third and fourth in 2017, while the scores of Libya and Sudan were among the lowest. Egypt's overall score decreased and its ranking dropped, but it still had the fifth highest score of the EMR countries. The scores of Afghanistan, Bahrain, Djibouti, Iraq, Jordan, Morocco, Oman, Qatar,

Somalia, Syrian Arab Republic and United Arab Emirates also all increased from 2015 to 2017. More tobacco control programmes have recently been introduced in the EMR (20,21), but they need more time for their effectiveness to be felt.

It is therefore important that EMR countries, particularly those with a decrease in their scores from 2015, to re-examine their performance in order to have stronger national tobacco control plans that incorporate the 6 key policies of MPOWER. In 2006, Joossens and Raw compared tobacco control scores in European countries (22). The same methodology was followed to compare the 22 EMR countries; the study showed Egypt, Jordan and the Islamic Republic of Iran had the highest scores (20). Two previous studies which compared tobacco control programmes among EMR countries and based on the WHO MPOWER reports were published in 2011 and 2013 (12,13). These used the same checklist and scoring system and so offered an opportunity to monitor trends in the increase or decrease of tobacco control indicators from 2011. Comparing the total scores of EMR countries in 2011, 2013 and 2015, we found a 25-point decrease in 2015 compared with 2013 in contrast to the 37-point increase in 2013 compared with 2011. Of particular importance is the fact that tobacco taxation programmes have been

Table 4 Trend in WHO MPOWER scores in tobacco control based on WHO tobacco control reports in Eastern Mediterranean Region countries (8–11)

Country	Total score	Total score	Total score	Total score
	2017	2015	2013	2011
Islamic Republic of Iran	34	33	31	29
Pakistan	31	27	21	20
Yemen	27	22	17	17
Saudi Arabia	26	23	23	19
Egypt	25	29	28	28
Lebanon	24	24	26	17
Jordan	23	19	22	21
Morocco	22	21	17	17
Djibouti	22	20	25	20
Qatar	22	18	21	18
Kuwait	22	23	28	21
West Bank and Gaza Strip	20	21	25	20
Oman	20	15	21	16
Syrian Arab Republic	20	12	17	18
United Arab Emirates	19	16	17	24
Bahrain	21	15	22	21
Afghanistan	19	12	13	9
Tunisia	18	20	21	17
Iraq	19	15	18	17
Libya	18	23	22	21
Sudan	12	16	13	19
Somalia	7	4	6	7
Total scores	471	428	454	416

unsuccessful, even in countries with high overall scores, such as the Islamic Republic of Iran. Ten of the 22 EMR countries were unsuccessful in implementing a tobacco taxation programmes during 2011 to 2015.

All countries need to increase taxation rates to improve the overall performance in effective tobacco control measures. Another example is Egypt, which had a high overall score in 2017 but did not score well in smoke-free policies; consequently, more effective reinforcement measures need to be taken. The 2017 data show some challenges in implementing MPOWER policies in certain countries; for example in Kuwait and Saudi Arabia there was a decrease in compliance with smoke-free policies. At the same time, other policies remain unchanged in the countries, such as the inclusion of graphic health warnings on cigarette packets. There is also little steady progress in implementation of other policies, for example the policy on raising taxes. Some countries have gone below the 75% level of tax and, while some countries increased taxes, they did not reach the highest level, which was reported in a previous analysis (23,24). It is important that countries of the Region not only move forward and not backwards in policy-making, but also aim for the highest policy level, which is the most effective.

This study has some limitations. The MPOWER reports do not refer specifically to waterpipe and other forms of tobacco smoking. Political, social and economic variables that support or act as barriers to tobacco control were not investigated in this study. These factors should be investigated in future studies. The interference of the

tobacco industry with the implementation of the control programmes is not well reflected in such surveys. It is well known that the tobacco industry typically uses its large profits to expand its production, distribution and sale of tobacco products as well to influence policy-makers in order to impede tobacco control programmes (2).

Conclusion, EMR countries have introduced tobacco control laws after ratifying/acceding to the WHO FCTC, but there has been variable commitment by governments and policy-makers in enacting and reinforcing laws that would lead to effective control measures as assessed by the implementation of MPOWER policies. Although remarkable achievements have been made over the past 7 years, many challenges remain. To overcome them and catch up with the progress of other WHO regions, stronger measures need to be implemented and reinforced as part of comprehensive national plans that take into consideration all social and economic variables. A better outcome can be achieved by greater coordination and cooperation between the countries of the Region to draw up common control strategies. This has already been done successfully in other WHO regions in their fight against the global tobacco epidemic, as for example in the European region (25).

Funding: None.

Competing interests: None declared

Programme MPOWER – besoins et défis : tendances dans la mise en œuvre de la Convention-cadre de l'OMS pour la lutte antitabac dans la Région de la Méditerranée orientale

Résumé

Contexte : Le programme MPOWER de l'OMS vise à aider les pays à accorder la priorité aux mesures de lutte antitabac, conformément à la Convention-cadre de l'OMS pour la lutte antitabac.

Objectif : La présente étude a évalué les progrès et les défis de la mise en œuvre des six politiques prioritaires du programme MPOWER dans les pays de la Région OMS de la Méditerranée orientale depuis 2011.

Méthodes : Une liste de contrôle a été mise au point et des scores ont été assignés sur la base des indicateurs MPOWER (score maximum de 37). Des données sur le programme MPOWER dans la Région en 2015 et en 2017 publiées dans des rapports sur la lutte antitabac ont été extraites et se sont vues attribuer une note. Des données issues d'analyses similaires pour les années 2011 et 2013 ont également été incluses. Les pays ont été classés selon les notes attribuées pour chaque indicateur pour 2015 et 2017, et pour l'ensemble des scores pour 2011 et 2017.

Résultats : La République islamique d'Iran, l'Égypte et le Pakistan ont obtenu les scores les plus élevés pour 2015 (33, 29 et 27 respectivement), et la République islamique d'Iran, le Pakistan et le Yémen ont obtenu les scores les plus élevés pour 2017 (34, 31 et 27 respectivement). Les indicateurs comportant les scores combinés les plus élevés et les plus bas pour l'ensemble des pays concernaient les interdictions de publicité et la conformité avec les politiques non-fumeur en 2015 (67 et 18 respectivement) et en 2017 (73 et 15 respectivement). La plupart des pays (15/22) ont obtenu des scores totaux plus élevés en 2017 qu'en 2015 : l'Afghanistan, Bahreïn et la République arabe syrienne, affichaient les augmentations les plus importantes. Le score total pour la Région a connu une augmentation, passant de 416 pour un score maximum de 814 en 2011, à 471 en 2017.

Conclusions : Bien que des réalisations considérables soient à noter dans la Région, de nombreux défis entravant la mise en œuvre des politiques demeurent et requièrent une intervention de toute urgence au niveau des gouvernements des pays de la Région.

مبادرة التحرر من التبغ، الاحتياجات والتحديات: الاتجاهات السائدة في تنفيذ اتفاقية منظمة الصحة العالمية الإطارية بشأن مكافحة التبغ في إقليم شرق المتوسط

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الخلاصة

الخلفية: تهدف مبادرة منظمة الصحة العالمية للتحرر من التبغ إلى تحديد الأولويات المتعلقة بتدابير مكافحة التبغ تمشياً مع اتفاقية منظمة الصحة العالمية الإطارية بشأن مكافحة التبغ. ولقد قامت هذه الدراسة بتقييم التقدم المحرز والتحديات المصادفة في تنفيذ السياسات الست ذات الأولوية لمبادرة التحرر من التبغ في بلدان إقليم شرق المتوسط منذ عام ٢٠١١.

طرق البحث: تم تصميم قائمة مرجعية وإسناد درجات على أساس مؤشرات مبادرة التحرر من التبغ (بحد أقصى ٣٧ درجة). واشتقت بيانات المبادرة المتعلقة بالإقليم في عامي ٢٠١٥ و ٢٠١٧ والواردة في تقارير مكافحة التبغ وأسندت إليها درجات. كما أدرجت بيانات مشتقة من تحليلات مماثلة لعامي ٢٠١١ و ٢٠١٣. وصُنفت البلدان حسب الدرجات المسندة لكل مؤشر لعامي ٢٠١٥ و ٢٠١٧ وحسب المجموع الكلي للدرجات في الفترة من ٢٠١١ إلى ٢٠١٧.

النتائج: سجّلت جمهورية إيران الإسلامية ومصر وباكستان أعلى الدرجات في عام ٢٠١٥ (٣٣ و ٢٩ و ٢٧ درجة على التوالي)، في حين سجّلت جمهورية إيران الإسلامية وباكستان واليمن أعلى الدرجات في عام ٢٠١٧ (٣٤ و ٣١ و ٢٧ درجة على التوالي). وسجّل مؤشراً حظر الإعلان عن التبغ والامتنال لسياسات حظر التدخين أعلى وأدنى درجة مجمعة لجميع البلدان (٦٧ و ١٨ على التوالي) في عام ٢٠١٥ (٧٣ و ١٥ على التوالي) في عام ٢٠١٧. وحقق معظم البلدان (٢٢/١٥) مجموع درجات أعلى في عام ٢٠١٧ منه في عام ٢٠١٥: حيث سجلت الجمهورية العربية السورية وأفغانستان والبحرين أعلى الزيادات. وارتفع مجموع درجات الإقليم من ٤١٦ درجة، من أصل ٨١٤ وهي الدرجة القصوى في عام ٢٠١١، إلى ٤٧١ درجة في عام ٢٠١٧.

الاستنتاجات: على الرغم من الإنجازات المهمة التي تحققت في الإقليم، لا يزال هناك الكثير من التحديات القائمة على مستوى تنفيذ السياسات، وهو ما يتطلب اتخاذ إجراءات عاجلة من جانب حكومات دول الإقليم.

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Tobacco advertising, promotion and sponsorship in entertainment media: a phenomenon requiring stronger controls in the Eastern Mediterranean Region

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Abstract

Tobacco use and placement of tobacco products in television (TV) productions and movies is a way to promote tobacco use while avoiding tobacco advertising bans that exist in most countries. The fact that such productions are broadcast widely and viewed by millions, including children and young people, is of concern. This paper reviews the evidence on the use of tobacco advertising, promotion and sponsorship (TAPS) in TV and films in the Eastern Mediterranean Region and the ways to combat it. Evidence from Egypt shows considerable and increasing use of tobacco products by actors on screen, including female actors, in programmes aired during Ramadan in 2015–2017. A study of Iranian movies in 2015 showed that tobacco scenes in Iranian movies were increasing. In 2014, the WHO Regional Office for the Eastern Mediterranean held a consultative meeting on TAPS in drama. The consultation recommended regulating the tobacco presence in movies and TV through complete implementation of Article 13 of the WHO FCTC, and raising the issue to the WHO FCTC Conference of the Parties. In 2016, the Conference of the Parties called on parties to consider scaling up the implementation of WHO FCTC Article 13 and monitoring the use of TAPS in entertainment media in accordance with national legislation. A comprehensive approach is essential to end the tobacco industry's use of TV productions and movies to promote their products.

Keywords: tobacco; smoking; noncommunicable diseases; FCTC; media

Citation: El-Awa F, Abou El Naga R, Labib S, Latif N. Tobacco advertising, promotion and sponsorship in entertainment media: a phenomenon requiring stronger controls in the Eastern Mediterranean Region. *East Mediterr Health J.* 2018;24(1):72–76. <https://doi.org/10.26719/2018.24.1.72>

Received: 28/09/17; accepted: 13/11/17

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Introduction

In 2014 the extensive tobacco use and placement of tobacco products in television (TV) productions in many countries and satellite channels airing across the Eastern Mediterranean Region (EMR) was noted. In response, the World Health Organization Regional Office for the Eastern Mediterranean (EMRO) held a consultative meeting on tobacco advertising, promotion and sponsorship (TAPS) in entertainment media. In its recommendations (1), EMRO highlighted two important measures: first, countries needed to continue monitoring TAPS in the entertainment media; and second, EMR parties to the WHO Framework Convention on Tobacco Control (FCTC) should raise this problem to the level of the WHO FCTC Conference of the Parties (2).

The problem

Since the consultation, 3 reports have been released by the Egyptian Fund for Combating and Treatment of Addiction and Drug Abuse (<http://drugcontrol.org.eg/>), which studied TAPS in TV dramas aired in the month of Ramadan in 2015–2017 (3).

Ramadan was selected as the focus of these 3 reports because, over the past 10 years, it has been the practice of

TV producers to make TV series specifically for broadcast during this period. Each series has 30 episodes (one for each day of the month of Ramadan) and each episode, when combined with advertisements aired every 15–20 minutes, lasts 45–60 minutes. In 2017, it was estimated that 33 series were produced for Ramadan in Egypt alone, while other countries, such as Kuwait, Lebanon and the Syrian Arab Republic also made TV programmes for Ramadan.

The reports monitored all TV production in 2015 (24 series), 2016 (29 series) and 2017 (33 series). The findings showed considerable use of tobacco products. In 2015, of the total airing duration in the selected sample, 10% showed tobacco use by one or more actors. In 2016, 9% showed tobacco use by one or more actors and in 2017, 13% showed tobacco use by one or more actors.

Female smoking was high throughout the 3 years: in 2015, 18.3% of female actors smoked, in 2016, 19.7% smoked, while in 2017, 15.0% of female actors smoked. In the 2015 study, only 4.2% of the series produced for airing during Ramadan did not show tobacco use. In 2016 and 2017, tobacco use was shown in all the series. The 2016 study showed that 74% of smoking scenes featured cigarette use, 16.7% showed waterpipe use, 9% showed cigar use

and 2.3% showed electronic cigarette use. The use of more than one tobacco product was sometimes shown in the same scene.

Tobacco use in entertainment productions is not limited to Arabic-speaking countries in the Region or restricted to series airing during Ramadan. A study of Iranian movies conducted in 2015 showed that tobacco scenes in Iranian movies were increasing over time (4). An editorial in *The Lancet* also noted that despite the WHO FCTC’s commitment to ban tobacco advertising, promotion and sponsorship, “film remains a potent way of exposing young people to images of smoking without restrictions” (5). The most recent data from the Global Youth Tobacco Survey show that despite the ban on direct tobacco advertising in many countries, a very high proportion of 13–15-year-olds in the EMR see tobacco use on TV (Figure 1).

The problem of the use of TV series and films to promote tobacco is a global one. However, the situation in the EMR has certain regional characteristics. For example, TV series focus on the month of Ramadan, during which people relax in front of the TV after breaking their fast (after sunset). These broadcast hours have a substantial number of scenes with all forms of tobacco use, including waterpipe, cigar and, more recently, electronic cigarettes. This may promote tobacco use in non-users and encourage smokers to smoke more by portraying it as an enjoyable, relaxing activity; this would produce more second-hand smoke for those who are not smokers. Moreover, it seems that this practice is attempting to create new realities: for example, the average regional prevalence of tobacco use among women does not exceed 4% (6), but in TV series aired during Ramadan in 2016, 19.7% of female actors smoked. Furthermore, recent productions have introduced new types of tobacco; it has been reported that the first time electronic cigarettes were featured in TV productions was in Ramadan in 2016.

It is important to note that nearly all countries in the EMR have a legal ban on direct advertising of tobacco use (apart from Somalia). Promoting tobacco use through TV productions, in the ways described above, is an obvious way to undermine these bans. Placing tobacco use within scenes in TV series and films completely circumvents the bans. These productions are not only broadcast widely in most countries in the Region but are accessible to all age groups (7). This situation is not limited to the EMR, as it is seen in other countries as well (8).

Although there is no firm evidence that the tobacco industry is paying for product placement in Ramadan TV series, the extensive use of tobacco in these series raises suspicions about the forces behind such a phenomenon. As yet, no studies have assessed the effect of scenes showing tobacco use on youth in the Region. However, evidence from outside the Region shows that there is a strong link between youth smoking and tobacco use in films. For example, in a report by the Centers for Disease Control and Prevention on the situation in the United States of America, it is suggested that “An R rating for movies with tobacco use could potentially reduce the number of teen smokers by 18% and prevent their premature deaths from tobacco-related diseases” (9). There is nothing to suggest that evidence from the EMR would contradict this.

Way forward

From evidence gathered globally, it is now clear that exposure to on-screen smoking results in the initiation of smoking by youths (10). Thus, for successful tobacco control, it is essential to control (including banning) tobacco use in films and TV productions.

While over the past 10 years the number of TV series produced specifically for Ramadan has increased and the number of tobacco-use scenes in these series has also risen (3), the TAPS phenomenon must be addressed in the broader context of entertainment productions in general.

Figure 1 Graph showing percentage of EMR youth exposed to on-screen tobacco use.



This can be done by looking into all entertainment productions in the Region – whether TV series or movie, or aired specifically in Ramadan or not. Moreover, productions from all countries must be considered. This is crucial for the successful implementation of controls because of the now widespread use of satellite channels. The proliferation of satellite TV has meant that the airing of any TV production is no longer limited to its country of production. Rather, TV series have become cross-border, transnational products.

The 2014 EMRO consultation report proposed several actions (1) that are in line with the recommendations of the WHO publication *Smoke-free movies: from evidence to action* (11). The most important of these is the regulation of tobacco presence in movies and TV productions through the full implementation of Article 13 of the WHO FCTC and its *Guidelines on tobacco advertising promotion and sponsorship* (12), which calls for a comprehensive ban on tobacco advertising, promotion and sponsorship. Such an intervention has worked well in other countries, stating that: “policies that prohibit product placement may help explain differences in content across nationally produced films. For example, relatively lower levels of tobacco in US films are likely due to the 1997 prohibition of tobacco product placement, after which tobacco portrayals in US films declined” (13).

The consultation report went on to emphasise the simultaneous need to continue monitoring tobacco use in TV productions and films and to regulate TAPS in drama, through legally binding declarations of interests that confirm producers have not received, and will not receive, any funds from the tobacco industry. Furthermore, the report underlined the importance of obligatory adult ratings for movies with high levels of tobacco placement and the establishment of regional observatories to monitor tobacco use in TV and films, such as the one established by the Egyptian Fund for Combating and Treatment of Addiction and Drug Abuse.

To fulfil the proposed measures, the consultation report suggested that countries engage TV producers and film-makers in the discussion and decision-making process. While following these recommendations, it is important for countries to avoid voluntary agreements and approaches as these are not effective. Indeed, in 2014 the Egyptian Fund for Combating and Treatment of Addiction and Drug Abuse issued a code of ethics for TV producers, with the purpose of banning tobacco use in TV productions. Unfortunately, the code did not work and, following its signature, tobacco use on TV continued at the same level as before, if not higher.

One of the key recommendations of the consultation report was to raise the issue to the WHO FCTC Conference of the Parties in order to seek global consensus on needed actions. This is particularly important in light of some claims that any attempt to control the TAPS phenomenon is against freedom of speech. It was this claim that hindered attempts to control on-screen tobacco use in other countries, as was the case in India (14).

The Conference of the Parties, in its Seventh Session (2016), discussed the issue of tobacco advertising, promotion and sponsorship in relation to the depiction of tobacco in entertainment media. The issue had been raised as an agenda item by Egypt on behalf of EMR Parties. The Conference of the Parties adopted a decision that recommended action at 2 levels (2): first, at the institutional level led by the WHO FCTC Secretariat; and second, at the national level led by the parties. In its recommendations for countries, the Conference of the Parties called for the following considerations:

- scaling up the implementation of WHO FCTC Article 13 and its Guidelines to achieve comprehensive coverage on both cross-border advertising and TAPS in entertainment media;
- monitoring the use of TAPS in entertainment media and cross-border advertising in accordance with national legislation and priorities” (15).

While the implementation of the institutional recommendations will benefit all countries and parties to the WHO FCTC, it remains important to follow up on national recommendations and to continue to collect national evidence on the status and practices of the tobacco industry. This includes the industry’s tobacco promotion through TV productions and movies. In addition, the regular inclusion of this item on the Conference of the Parties agenda will highlight the importance of countries’ attempts to control on-screen TAPS, while also offering political support for countries to take strong action. There is also a need for a knowledge, attitude and practice study on TAPS in films among film-makers to understand better their position and, using evidence, engage them in controlling this practice in movies.

A comprehensive approach is essential for tobacco control. It is especially important to ban all TAPS, effectively execute the relevant legislation and not to leave any loopholes that the tobacco industry can exploit. This is the only way to move forwards and end the tobacco industry’s use of TV productions and movies to promote their products and undermine national legislation bans on tobacco advertising, promotion and sponsorship.

Acknowledgements

The authors thank the team from the Egyptian Fund for Combating and Treatment of Addiction and Drug Abuse, led by Mr Amr Osman, for providing the results of the studies reviewed in this article.

Funding: None.

Competing interests: None declared.

Publicité en faveur du tabac, promotion et parrainage dans les médias du divertissement : un phénomène requérant un contrôle renforcé dans la Région de la Méditerranée orientale

Résumé

La consommation de tabac et le placement des produits du tabac dans les productions télévisées et au cinéma représentent une façon de promouvoir le tabagisme tout en contournant les interdictions de publicité en faveur du tabac existantes dans la plupart des pays. Le fait que de telles productions soient largement diffusées et vues par des millions de personnes, notamment des enfants et des jeunes, est préoccupant. La présente étude passe en revue les données sur la publicité en faveur du tabac, la promotion et le parrainage à la télévision et au cinéma dans la Région de la Méditerranée orientale, ainsi que les façons de les combattre. En Égypte, les données montrent que l'utilisation des produits du tabac chez les acteurs, notamment chez les actrices, dans les programmes diffusés pendant le Ramadan entre 2015 et 2017 est considérable et a connu une hausse. Une étude des films iraniens en 2015 a montré que les scènes où l'on voyait des acteurs fumer avaient augmenté. En 2014, le Bureau régional de l'OMS pour la Méditerranée orientale a organisé une réunion de consultation sur la publicité en faveur du tabac, la promotion et le parrainage dans les œuvres dramatiques. La consultation a recommandé de réglementer la présence des produits du tabac au cinéma et à la télévision au moyen de l'application complète de l'article 13 de la Convention-cadre de l'OMS pour la lutte antitabac, ainsi que de faire état du problème lors de la Conférence des Parties à la Convention-cadre de l'OMS pour la lutte antitabac. En 2016, la Conférence des Parties a appelé les Parties à envisager d'intensifier l'application de cet article, ainsi que de procéder à un suivi de la publicité en faveur du tabac, de la promotion et du parrainage dans les médias du divertissement, conformément à la législation nationale. Une approche globale est essentielle pour mettre un terme à l'utilisation des productions télévisées et du cinéma par l'industrie du tabac dans le but de faire la promotion de ses produits.

الإعلان عن التبغ والترويج له ورعايته في وسائل الإعلام الترفيهية: ظاهرة تتطلب تشديد الضوابط عليها في إقليم شرق المتوسط

فاطمة العوا، راندا أبو النجا، سحر لبيب، نسرين عبد اللطيف

الخلاصة

يشكل تعاطي التبغ والإعلان عن منتجاته في مواد الإنتاج التلفزيوني والأفلام طريقة للترويج لتعاطيه مع تجنب حظر الإعلان عن التبغ المعمول به في معظم البلدان. ومما يبعث على القلق أن مواد الإنتاج هذه تُبث على نطاق واسع وتجذب ملايين المشاهدين، ومنهم أطفالاً وشباباً. وتستعرض هذه الدراسة البراهين المتعلقة باستخدام الإعلان عن التبغ والترويج له ورعايته في السينما والتلفزيون في إقليم شرق المتوسط وسبل مكافحته. وتظهر البراهين المستقاة من مصر كثرة وتزايد استخدام منتجات التبغ من قبل الممثلين، بل والممثلات، في إطار البرامج التي عُرضت خلال شهر رمضان في الفترة 2015-2017. وأظهرت دراسة للأفلام الإيرانية أجريت في عام 2015 تزايد مشاهد تعاطي التبغ في الأفلام الإيرانية. وفي عام 2014، عقد المكتب الإقليمي لمنظمة الصحة العالمية لشرق المتوسط اجتماعاً تشاورياً بشأن الإعلان عن التبغ والترويج له ورعايته في الأعمال الدرامية. وأوصى الاجتماع بتنظيم ظهور التبغ في السينما والتلفزيون عن طريق التنفيذ الكامل للمادة 13 من اتفاقية منظمة الصحة العالمية الإطارية بشأن مكافحة التبغ، وإثارة المسألة أمام مؤتمر الأطراف في الاتفاقية. وفي عام 2016، دعا المؤتمر أطراف الاتفاقية إلى النظر في توسيع نطاق تنفيذ المادة 13 من الاتفاقية ورصد استخدام الإعلان عن التبغ والترويج له ورعايته في وسائل الإعلام الترفيهية وفقاً للتشريعات الوطنية. ويمثل اعتماد نهج شامل عنصراً ضرورياً للحد من استخدام شركات التبغ للإنتاج التلفزيوني والأفلام في الترويج لمنتجاتها.

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Review of the nutrition situation in the Eastern Mediterranean Region

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Abstract

This situation analysis for the World Health Organization Eastern Mediterranean Region focuses on specific nutrition indicators, namely low birth weight, exclusive breastfeeding, under- and overnutrition (anthropometric indicators) and anaemia. The regional average prevalence of low birth weight and exclusive breastfeeding was estimated at 19.31% and 29.3%, respectively. Stunting, wasting and underweight had an average prevalence of 28%, 8.69% and 18%, respectively. Afghanistan, Djibouti, Pakistan, Sudan and Yemen had the highest burden of stunting (> 30%). Prevalence of anaemia ranged from 7.4% to 88% in children aged < 5 years and from 19.9% to 63% in women of childbearing age. Of concern is the increasing trend in overweight and obesity among adults and children. Average prevalence of overweight and obesity was 27% and 24% in adults and 16.5% and 4.8% in school-aged children, respectively. The highest levels of obesity were reported from Bahrain, Kuwait, Qatar and the United Arab Emirates. This review highlights the double burden of malnutrition in countries of the Region and calls for the prioritization of policies aimed at improving the population's nutritional status.

Keywords: Breastfeeding; malnutrition; anaemia; obesity; stunting

Citation: Nasreddine L, Ayoub JJ, Al Jawaldeh A. Review of the nutrition situation in the Eastern Mediterranean Region. *East Mediterr Health J*. 2018;24(1):77–91. <https://doi.org/10.26719/2018.24.1.77>

Received: 18/07/17; accepted: 4/01/18

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Introduction

Malnutrition represents the number one risk factor in the global burden of disease (1). Despite increasing attention to the alleviation of hunger worldwide (1), undernutrition remains a devastating multifaceted problem affecting infants, young children, adolescent girls and women (2). Children who suffer from chronic undernutrition in the early stages of life fail to grow and develop to their full potential, both mentally and physically (3), and are at increased risk for noncommunicable diseases (NCDs) (4). Acute undernutrition, indicated by wasting in children aged < 5 years, is a strong predictor of mortality (5). Conversely, overnutrition and obesity-associated morbidity are plaguing the global economies and health systems (6, 7). In November 2014, the *Rome Declaration on Nutrition*, issued at the Second International Conference on Nutrition, acknowledged that malnutrition in all its forms affects people's health and well-being and presents a threat to the social and economic development of communities and countries (8). The Declaration also acknowledged that different forms of malnutrition coexist within most countries. This is particularly true for countries of the World Health Organization (WHO) Eastern Mediterranean Region, which typically suffer from a double burden of malnutrition. The *Regional Strategy on Nutrition 2010–2019* indicated that the burden of disease associated with inadequate nutrition continues to grow (9). While the prevalence of undernutrition remains high in some Eastern Mediterranean countries, the burden of overweight, obesity and diet-related chronic diseases is

increasing at an alarming rate. Factors that may play a role in modulating malnutrition include maternal health and nutrition, early life feeding practices, dietary intake and the food environment (10–13).

Overcoming malnutrition in all of its forms – caloric undernourishment and obesity – necessitates a combination of evidence-based interventions in various areas, to guarantee the availability of and access to healthy diets (14,15). These interventions should be guided by a thorough analysis of the nutrition situation and accurate data on nutritional indicators in the Region. These data are crucial, not only for the development of appropriate policies and interventions, but also for measuring progress. It is in this context that we have undertaken this review of nutritional indicators in the Region, including low birth weight (LBW), exclusive breastfeeding (EB), anaemia, and under- and overnutrition based on anthropometric indicators, among children aged < 5 years, school-age children and adults. This paper also examines secular trends in per capita energy and macronutrient supply in the Region, which includes 22 countries (16).

Methodology

For this narrative review, data pertinent to the six WHO core nutrition indicators were reviewed, including: (1) prevalence of EB (defined as no other food or drink, not even water, except breast milk for the first 6 months of life) (17); (2) LBW (defined as the percentage of infants

weighing < 2.5 kg at birth) (18); (3) stunting (height-for-age z score < -2) (19); (4) wasting (weight-for-height z score < -2) (19); (5) obesity/overweight (weight-for-height z score > 2) (19) in children aged < 5 years; and (6) anaemia in pregnant women (haemoglobin < 11 g/dl) (20) and women of childbearing age (haemoglobin < 12 g/dl). Data related to overweight and obesity in school-aged children [body mass index (BMI)-for-age z score > 1 (21) and adults (BMI \geq 25 kg/m² (22))] were also abstracted. In addition, per capita dietary supply data (energy and macronutrients) were reviewed based on food availability data from the Food and Agriculture Organization of the United Nations (FAO) statistical database (23). The following electronic databases were searched between January 15 and April 20, 2015: MedLine, PubMed, Scopus, Google Scholar, WHO STEPS Country Reports (24), WHO Global School-based Student Health Survey (25), WHO Global Database on Child Growth and Malnutrition (26), UNICEF Multiple Indicator Cluster Survey datasets (27). Food and Nutrition in Numbers (28) and FAO-UN FAOSTAT Food Balance Sheets (23). Websites of the ministries of health in the respective countries were also reviewed to identify additional data sources. The weighted regional average was calculated for each nutrition indicator, based on data available. When data were available at various time points, the annual rate of change was calculated for specific nutrition indicators.

Results

Prevalence of LBW

The weighted average prevalence of LBW in the Eastern Mediterranean Region was estimated at 19.31%. LBW prevalence was > 30% in Sudan (28) and Pakistan (28) and reached 45% in Yemen (29) (Figure 1). The lowest rates of LBW were reported from Morocco (30), the United Arab Emirates (UAE), the Islamic Republic of Iran, Tunisia, Kuwait and Libya (28). Over time, an increasing trend in LBW prevalence was noticed in Yemen (28,29), Pakistan (28), Lebanon (28), Oman (31,32), Somalia (33,34) and the Syrian Arab Republic (28). The remaining countries have mostly witnessed a stabilization or a decrease in LBW rates. This decrease was particularly noticeable in the UAE (28), Morocco (17,28) and Djibouti (28).

Prevalence of EB

The regional average for EB was estimated at 29.3%, with the lowest rates being observed in Somalia (35), Tunisia (36), Yemen (28,37), Kuwait (28), Oman (28), Lebanon (28,38), Qatar (39,40), Iraq (41), Jordan (42) and Morocco (43) (Figure 2). The highest rates were reported from Afghanistan (44), the Islamic Republic of Iran (45) and Djibouti (46). The prevalence of EB decreased with infant age. In Egypt, for example, the prevalence of EB decreased from 45.7% among infants aged 0–4 months to 30.3% among those aged 0–6 months (17,47). Similarly, a 2006 study

Figure 1 Prevalence of low birth weight in the Eastern Mediterranean Region

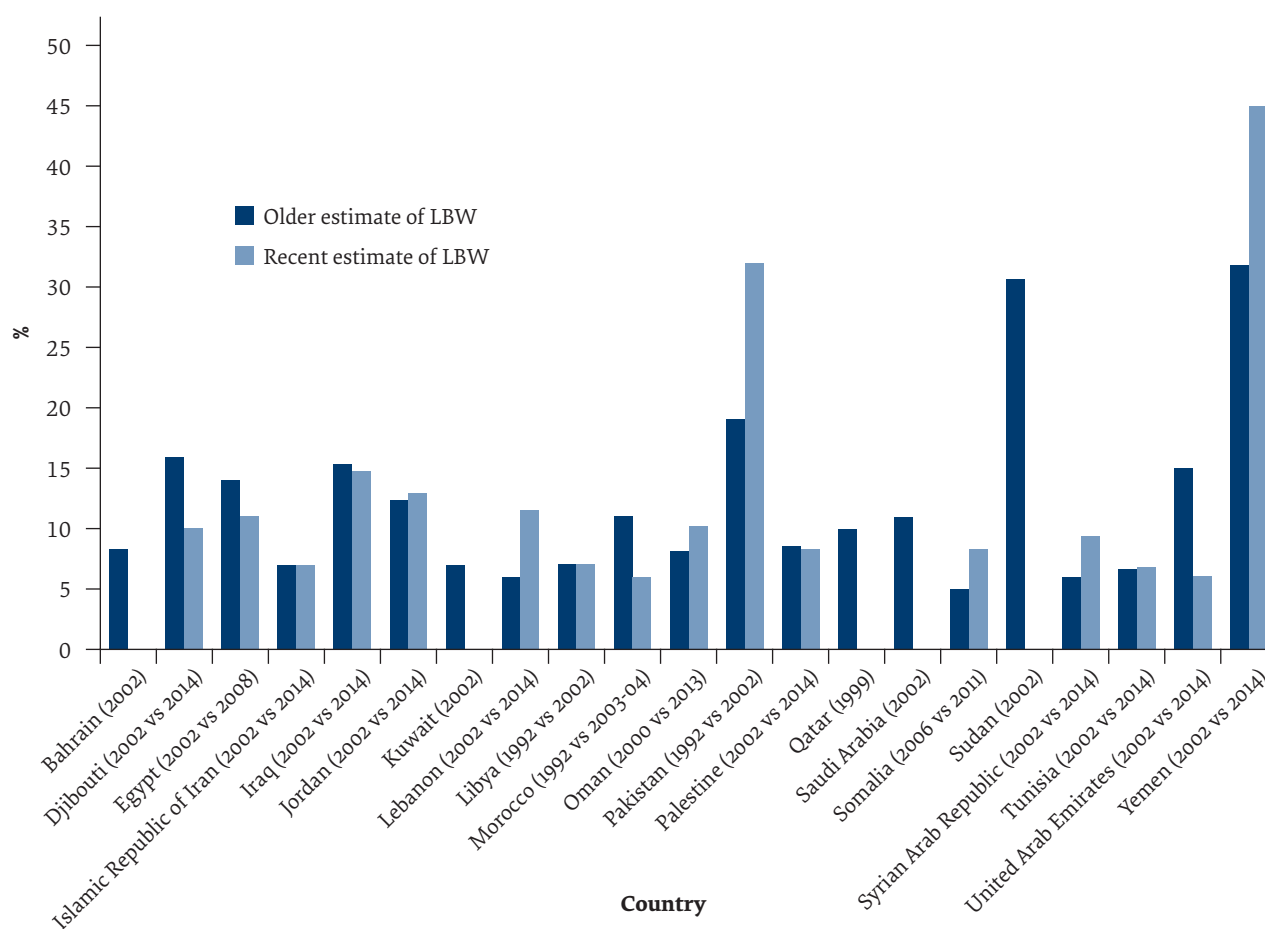
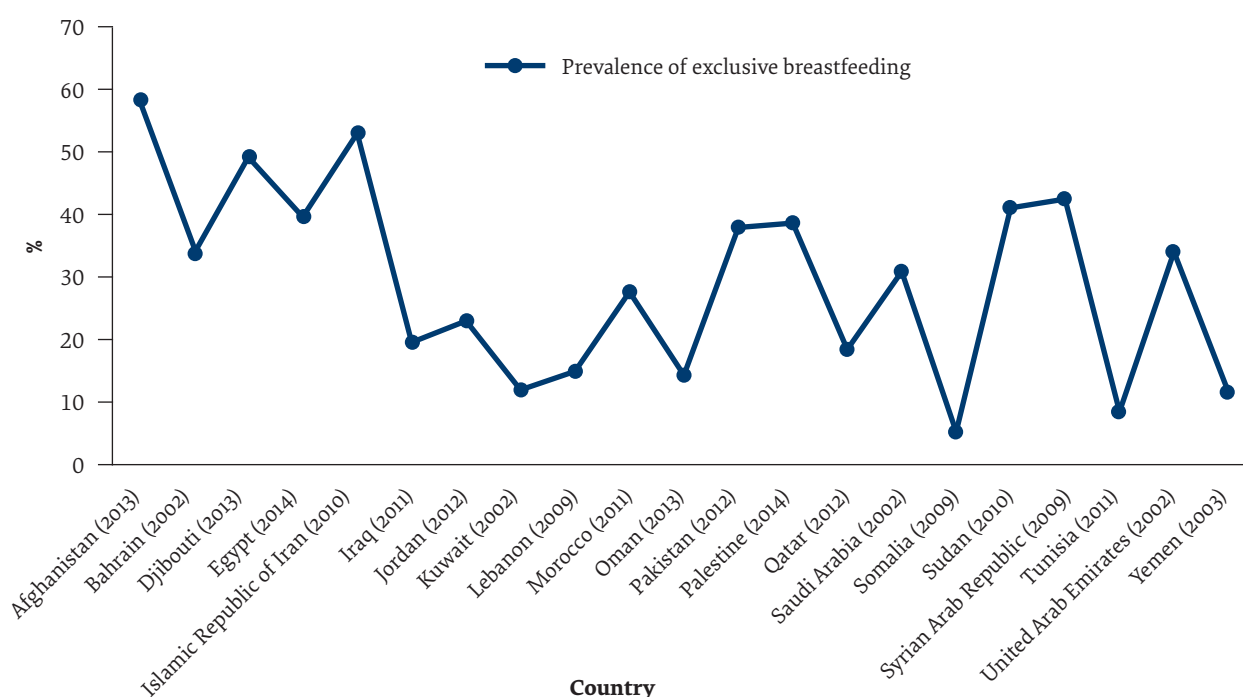


Figure 2 Prevalence of exclusive breastfeeding in the Eastern Mediterranean Region

conducted in Lebanon (48) showed that the proportion of exclusively breastfed infants declined from 52.4% at age 1 month to 23.4% at 4 months and 10.1% at 6 months. Furthermore, a decreasing trend in the prevalence of EB has been noticed over time in some countries of the Region. This is particularly true for Morocco (51% in 1992 and 27.8% in 2011) (43), Lebanon (26.6% in 2000 and 14.8% in 2009) (17,28,38,49), Oman (31.3% in 2005 and 14.4% in 2013), Sudan (74.6% in 1992–1993 and 41% in 2010) (17,28,41,50,51), Somalia (21% in 1999 and 5.3% in 2009) (17,35,41,52), Yemen (17.8% in 1997 and 11.5% in 2003) (28,37,53), and Jordan (27% in 2002 and 23% in 2012) (38,41–43,49,50). In contrast, an increasing trend was observed in the Islamic Republic of Iran (44% in 2002 and 53.1% in 2010) (41,45), Egypt (30.3% in 2003 and 39.7% in 2014) (17,47,54), Iraq (12.4% in 2000 and 19.6% in 2011) (41,55), Pakistan (22.8% in 1990–1991 and 38% in 2012) (41,56) and occupied Palestinian territory (26.6% in 2010 and 38.6% in 2014) (57,58).

Prevalence of stunting, wasting and underweight in children aged < 5 years

The estimated weighted regional averages for stunting, wasting and underweight were 28%, 8.69% and 18%, respectively. The prevalence of wasting was highest in Djibouti (46), Sudan (51), Yemen (59) and Somalia (60,61), while the prevalence of underweight was highest in Afghanistan (44) and Yemen (59) (Figure 3). Countries such as Iraq (55,61–63), Libya (61,64,65), Egypt (54,66) and Sudan (51,61,67), which are experiencing political unrest, have witnessed an increase in the prevalence of wasting

over time. Similarly, an increasing trend in the prevalence of underweight was observed in Djibouti (61,68,69), Sudan (51,61,67), Iraq (61–63), Libya (61,64,65) and the Syrian Arab Republic (61,70)¹. The highest rates of stunting were noted in Yemen (59), Pakistan (61,71), Afghanistan (44), Sudan (51) and Djibouti (46), ranging between 29.7% and 46.5%. The average annual rate of change in the prevalence of stunting in the Region was estimated at –2.8%. Of concern is the increasing prevalence of stunting that has been observed in Djibouti (61,68,69,72) and Pakistan (61,71,73,74).

Prevalence of anaemia

The prevalence of anaemia ranged from 7.4% to 88% in children aged < 5 years (haemoglobin <11 g/dl) (20), 7.4–40.9% in school-aged children (haemoglobin < 12 g/dl) (20), 16–81% in pregnant women, and 19.9–63% among women of reproductive age. The highest prevalence of anaemia was found in Sudan for children aged < 5 years (88%) (75) and pregnant women (81%) (75), in Oman (40.9%) for school-aged children (76) and in Djibouti (63%) (77) for women of childbearing age.

Prevalence of overweight and obesity

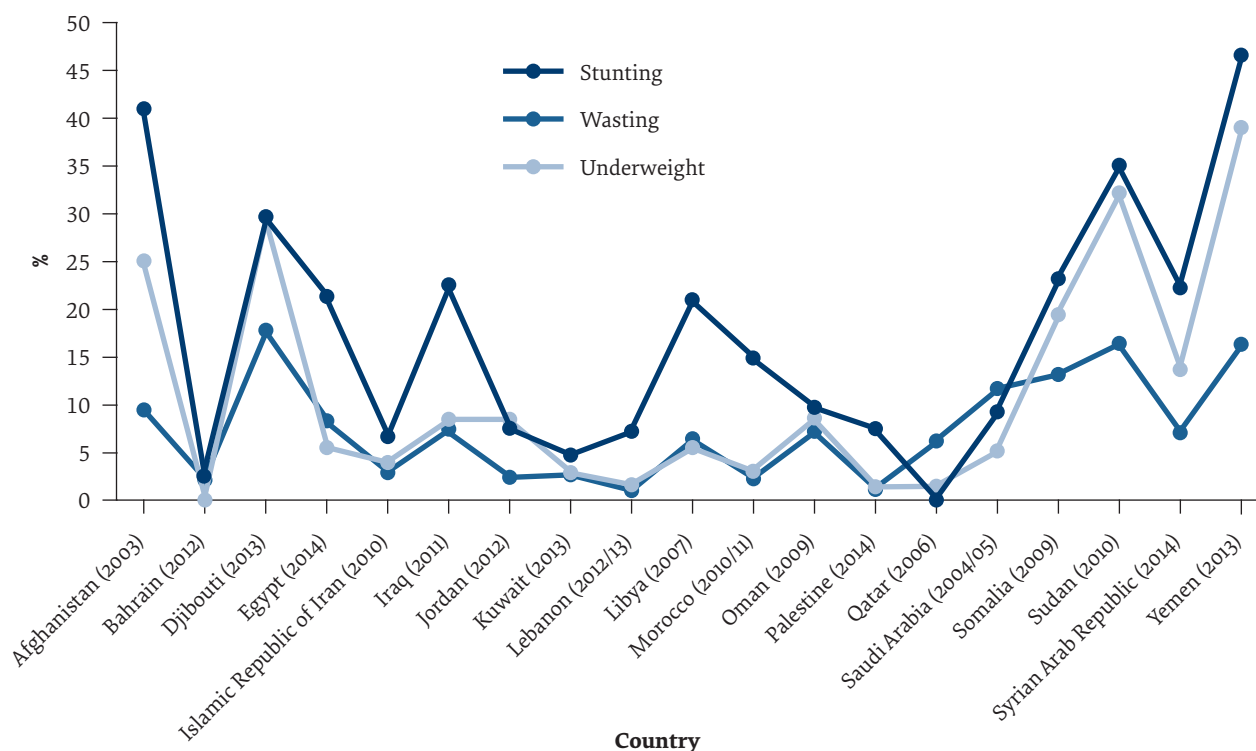
Adults

The estimated weighted average prevalence of adult overweight and obesity in the Region was 27% and 24%, respectively. A higher prevalence of obesity was noted among women compared to men (78–83)². The highest level of obesity was reported from Kuwait (42.5% in

¹ Syrian Ministry of Health and Central Bureau of Statistics. Rapid Nutrition Assessment (RNA). Final RNA report; 2014 (unpublished data).

² Food and Nutrition Administration/Ministry of Health Kuwait. Kuwait National Surveillance System (KNSS). Annual report; 2013 (unpublished)

Figure 3 Prevalence of stunting, wasting and underweight among children aged < 5 years in the Eastern Mediterranean Region



men and 47.1% in women)², Qatar (39.5% in men and 43.2% in women) (83), Bahrain (32.3% in men and 40.3% in women) (79), the UAE (33%) (84), Egypt (31.3%) (80) and Libya (30.5%) (85). The prevalence of obesity was lowest in Somalia (6.7% in women) (35), Afghanistan (8.3% in women) (44) and Yemen (8.8%) (86). Available data suggest an increasing secular trend in the prevalence of adult obesity in most countries of the Region. This trend was more pronounced in countries such as the UAE (88,89), Tunisia (90,91), Afghanistan (44), Kuwait (92), Bahrain (78,93) and Lebanon (93).

Women of reproductive age

Data on the prevalence of obesity in women of reproductive age (15–49 years) were available for Afghanistan (44), Egypt (66), Jordan (42), Libya (94) and Somalia (35) (Figure 4). Furthermore, in a study conducted in 2012 in the occupied Palestinian territory, the prevalence of obesity was estimated at 15.6% among mothers aged 18–28 years, 35.8% among those aged 29–39 years and 56.8% among those aged 40–50 years (95).

School-age children

The estimated weighted average prevalence of overweight and obesity among school-age children (13–15 years) was 16.46% and 4.83%, respectively. The highest prevalence of obesity was observed in Kuwait (29.6%)³, Bahrain (21.7%)⁴ and the UAE (14.4%) (96), while the lowest rates

were reported from Pakistan (1%) (97), Morocco (2.5%) (98), Afghanistan (2.7% in girls) (44), Sudan (3.6%) (99), Yemen (4.4%) (100) and Djibouti (4.6%) (101). Available data suggested an increase in the prevalence of overweight and obesity amongst school-age children. This was particularly true for the Islamic Republic of Iran (102, 103), Lebanon (93), Qatar (104, 105), Saudi Arabia (106–108), Tunisia (109, 110) and Bahrain (111, 112).

Children aged < 5 years

The estimated weighted average prevalence of overweight and obesity in children aged < 5 years was 8.42%. The highest prevalence was observed in Qatar (28.7%) (113), Libya (22.4%) (61,64), the Syrian Arab Republic (17.9%) (61,114) and Egypt (14.9%) (54), while the lowest was reported from Yemen (2%) (59) and Sudan (2.9%) (51). Available data suggest an increasing trend in the prevalence of overweight and obesity over time. This was particularly true for Afghanistan (44,61), Kuwait (61,115–117), Libya (61,64,65), Oman (61,118,119), Pakistan (61,73,118), Saudi Arabia (118) and Tunisia (36,61,120).

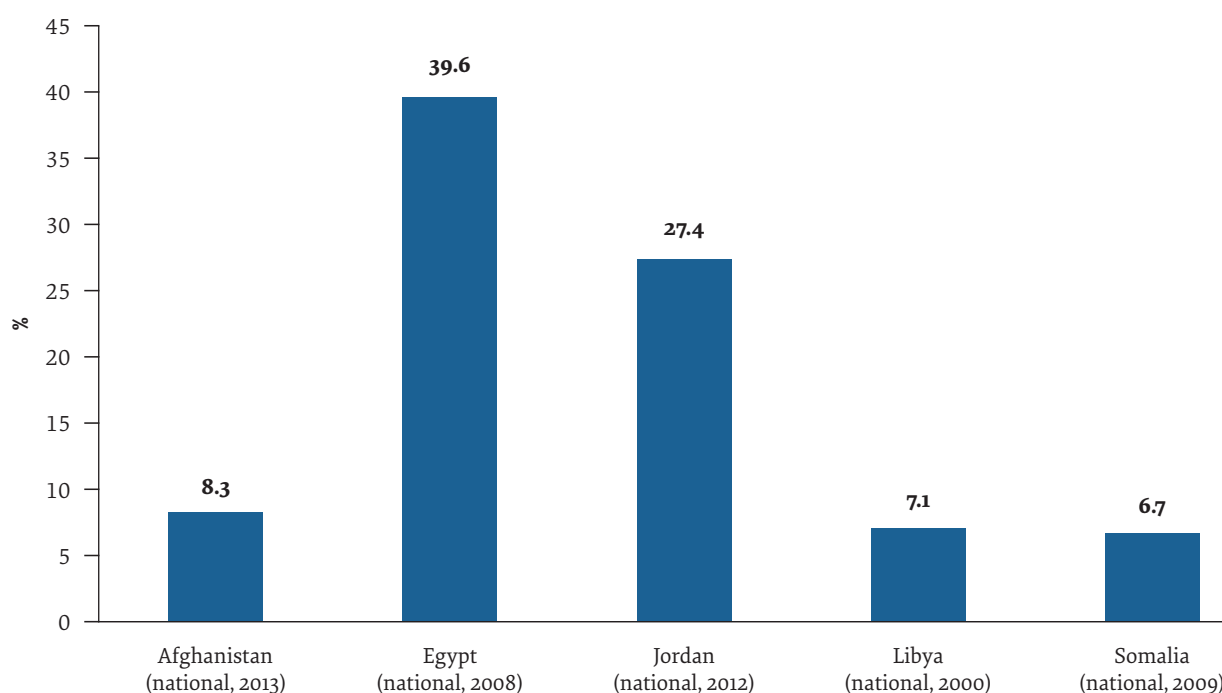
Energy and macronutrient supply

Food availability data (23) highlight a gradual secular increase in dietary energy supply (DES) in the Region between 1969–1971 and 2011, except for Afghanistan and Somalia, where DES decreased. The average increase in DES for the Region was 583.8 kcal/day, with the highest

³ Food and Nutrition Administration/Ministry of Health Kuwait. Kuwait National Surveillance System (KNSS). 2013 Annual Report (unpublished data).

⁴ Gharib N, Rasheed P. National Nutrition Survey for School Children age 6–18 in Bahrain. Nutrition Section, Kingdom of Bahrain Ministry of Health (unpublished data).

Figure 4 Prevalence of obesity (BMI ≥ 30 kg/m²) in women of reproductive age (15–49 years) in some Eastern Mediterranean Region countries



increases observed in Egypt (1290 kcal/day) and Saudi Arabia (1238 kcal/day), followed by the Islamic Republic of Iran (995 kcal/day), Tunisia (978 kcal/day), Morocco (962 kcal/day), Jordan (960 kcal/day), Libya (958 kcal/day) and Kuwait (926 kcal/day). The rise in DES was coupled with an increase in average dietary fat supply, which has increased from 51.8 g/day in 1969 to 77.7 g/day in 2011. During this period, fat supply has almost doubled in the Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, the Syrian Arab Republic and Saudi Arabia. The data also showed that the contribution of dietary fat to DES has increased in most countries of the Region, with the average increase being estimated at 4% of DES between 1969–1971 and 2011. The highest increases were noted in Pakistan (13.05%), Saudi Arabia (12.2%), the Syrian Arab Republic (8.62%), Jordan (8.04%), the Islamic Republic of Iran (6.12%), Kuwait (5.86%) and Lebanon (5.81%). Parallel to the increase in fat supply, a relative decrease in the contribution of carbohydrates to DES was noted in most countries, with an average of 4%. In contrast, the contribution of protein to DES was found to be stable over the past 4 decades, except for Somalia, which has witnessed a 2% decrease.

Discussion

This review highlighted the double burden of malnutrition in the Eastern Mediterranean Region, with undernutrition coexisting with overnutrition in most countries. The regional prevalence of LBW (19.31%) was higher than the global average of 16% (excluding China) (18) and higher than estimates reported from the United States of America (USA) and Europe (8.1% and 7.1%, respectively) (121). When examining the annual

rates of change, only Djibouti (–3.1%), Egypt (–3.5%), Morocco (–4.6%) and the UAE (–4.9%) appeared to be on track towards meeting the global nutrition targets (–2.74% for LBW) (122). This is of concern given that LBW children tend to have higher rates of subnormal growth, illnesses, neurodevelopmental problems and cognitive defects (123,124). In the Region, LBW may be linked, in many instances, to poor maternal health and prenatal conditions, such as poverty, crowded home environments, unfavourable work conditions (125), infections, short interpregnancy intervals, maternal obesity, smoking and poorer nutrition including anaemia (126,127), and rural residence (127).

This review also documents a low regional average of EB (29.3%), indicating poor adherence to the WHO's infant feeding recommendations. Of more concern is the observed decreasing trend in EB in several countries of the Region. The low prevalence of EB may have negative repercussions for the burden of disease in the Region. There is evidence that proper early infant nutrition may play an important role in the prevention of NCDs throughout life (128). EB in the first 6 months of life ensures adequate mental development and optimal physical growth, metabolic regulation and immunity (129). Several studies have also shown that breastfeeding lowers the risk of obesity in childhood and ensures a more linear pattern of growth in infancy (129).

The findings of this review show that several countries in the Region are still plagued with a high burden of undernutrition in young children. As per the WHO cutoffs (130), the levels of wasting were acceptable (< 5%) in only a few countries (Bahrain, the Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Morocco,

occupied Palestinian territory and Tunisia), while the regional average (8.69%) exceeded 5%. The regional average was also found to exceed the global average of wasting (7.7%) (131), as well as estimates reported from the USA (0.5%) (131), but it was lower than those reported from Asia (9.9%), excluding Japan (132). As for underweight, the regional average (18%) was higher than that reported in 2004 (17%), indicating that there has been no progress on this front (9). This regional average exceeds the global average of 14% (133), while it is lower than that reported from South Asia (29.8%). In addition, an increasing trend in the prevalence of stunting was observed in Djibouti and Pakistan, highlighting an increased threat of chronic undernutrition in these countries. The annual rate of change in the regional prevalence of stunting was estimated at -2.8% , which was below the rate specified by the 2025 World Health Assembly global nutrition target (-3.9%) (122). In fact, only a few countries appeared to be on the right track towards meeting the 2025 target for stunting, namely Bahrain (-4.7%), Egypt (-4.3%), the Islamic Republic of Iran (-4.4%), Lebanon (-6.2%), Morocco (-5.1%) and the occupied Palestinian territory (-8%). The regional average of stunting (28%) exceeded estimates reported from Europe (6.1%) (134) and the USA (2.1%) (135), although it was close to the worldwide average of 22.9% (135).

Anaemia, another hallmark of undernutrition among children and women of reproductive age, appears to be a persistent challenge in the Region, although some countries have witnessed progress in this indicator. For instance, in Morocco, a country that has implemented iron fortification of flour, the prevalence of anaemia among children aged 2–5 years decreased by 37.4% between 2006 and 2008 (136). Similarly, in Jordan, after the implementation of wheat flour fortification with multiple micronutrients, including iron, anaemia prevalence decreased from 40.4% in 2007 to 33.9% in 2009 among children aged 6–59 months (137).

The persistent burden of undernutrition in the Region may be linked to various environmental, economic and political factors. Food security is threatened by scarce freshwater resources, arid climate, high dependence on imports, limited productive economic diversification, high unemployment rates and income inequalities (138). The political unrest in many countries of the Region has contributed to further destabilization of the food security safety nets, livelihood and agricultural production. In fact, countries experiencing political turmoil have witnessed an increase in the prevalence of undernutrition over time. Moreover, food security appears as an economic challenge in the Region; the World Bank estimates that 5% of the Region's population is below the US\$1.25-a-day poverty line and suffers from numerous forms of deprivation, including malnutrition, and that the number of people afflicted with poverty had increased by 2.6 million by 2011 (139). The burden of undernutrition in the Region calls for action by all countries to end all forms of food insecurity, build economic growth and alleviate poverty, as highlighted by the Sustainable Development

Agenda (140). This may be particularly challenging to several countries that are currently facing armed conflict and political instability, while harbouring significant numbers of displaced people and forced population movements. These sociopolitical dimensions magnify the threat of food insecurity and nutritional inadequacies, particularly among the vulnerable and poorer segments of the population (8). In conformity with international law and the Sustainable Development Agenda, further effective measures and actions are needed to “remove obstacles and constraints, strengthen support and meet the special needs of people living in areas affected by complex humanitarian emergencies”, political turmoil and armed conflict (141).

This review also shows that, in all countries of the Region, undernutrition coexists with overnutrition, as assessed by obesity and overweight. The results highlight a high prevalence and increasing trend of adult obesity in many countries (44,87–90). The regional average of adult obesity (24%) exceeds the worldwide average (9.8% in men and 13.8% in women) (142), as well as estimates reported from South Asia (1.2–2.9%), but it is lower than the average prevalence of adult obesity in North America (29.2%) (142). Possible determinants of adult obesity in the Region include higher energy intakes, higher intakes of sugar-sweetened beverages, larger food portion sizes, low intakes of fruits and vegetables, physical inactivity and sedentary lifestyle, cultural norms and food subsidy policy (112,143,144). The escalating burden of adult obesity may have serious public health implications, given the positive associations between weight gain and NCDs (93,145), and that the Region already suffers from a high NCD burden, which accounts for > 50% of annual deaths (146). According to the WHO, deaths from NCDs were projected to increase by 25% between 2008 and 2018 in the Region, reflecting the second highest projected increase amongst the 6 WHO regions (147,148).

This review underlines the high burden and alarming increase in the prevalence of paediatric obesity in the Region. Among school-age children and adolescents, the annual rate of change in obesity prevalence exceeded in some countries, such as Bahrain (14.8% in girls), Tunisia (13.5%) and Qatar (13% in boys and 12.7% in girls), the predictions made by Wang and Lobstein for the Region (5.6%) (149). The prevalence of obesity among school-age children in Kuwait (29.6%), Bahrain (21.7%) and the UAE (14.4%) exceeds estimates reported from Europe (6.8–7.3%) (150) and the USA (18.7%) (151). Among children aged < 5 years, the prevalence of overweight/obesity increased in several countries, including Afghanistan, the Islamic Republic of Iran, Kuwait, Libya, Oman, Pakistan, Qatar, Saudi Arabia and Tunisia, with the highest annual rates of increase being observed in Saudi Arabia (37.1%), Libya (11.1%) and Tunisia (10.4%). The estimated regional average for overweight and obesity among children aged < 5 years was 8.42%, which exceeds the worldwide average (6.7%) and that reported for Asia (4.9%) and developing countries (6.1%), but it was lower than estimates reported for developed countries (11.7%) (118). The growing epidemic

of childhood obesity is a major public health concern, given that paediatric obesity has been shown to track into adulthood and predict a broad range of metabolic and psychological adverse health effects (152,153). Studies of the association of childhood obesity with socioeconomic, dietary and lifestyle factors have highlighted the following risk factors: higher socioeconomic status (154,155); urban residence (156); parental obesity (154,157), maternal BMI (155,158); television viewing (154); high sugar intake (155); high fat intake (155,156); high frequency of consumption of sugar-sweetened beverages and of fast foods (156,159); low consumption of vegetables, fruit and dairy products (156); and high frequency of eating out (156,160). Given the established link between paediatric obesity, the consumption of high-energy, high-sugar, high-fat foods and the marketing of such foods to children, the WHO Regional Office for the Eastern Mediterranean Region has recently released a regional nutrient profiling model designed for use by governments for the purposes of restricting food marketing to children (161).

Most countries in the Region are witnessing fast rates of development and modernization, with concurrent shifts in diet and food consumption (162). These shifts are the basis of the nutritional transition, which is characterized by increased intake of energy, fat, added sugars and salty foods (162,163). Through these particular changes in dietary intake, the nutritional transition may explain the escalating burden of obesity and NCDs in the Region (162–164). Food availability data highlight a shift towards an increasingly energy-dense diet and higher intake of fat in the Region, with a parallel decreasing trend in carbohydrate availability. This trend is confirmed by dietary assessment surveys, which also document high intake of fat, and a shift towards a westernized diet (159,162,165–168). Nearly half of the countries in the Region had fat supply levels at or above the reported global average of 81.8 g/person/day (169). The observed increasing trend in fat supply is worrying, given that available evidence highlights probable associations between fat intake, obesity and various NCDs (170).

While this review provides valuable insight into the nutritional situation of the Region, its findings should be viewed in light of the following limitations. The available data on nutritional indicators were, in many instances, limited by the scarcity of recent and nationally representative studies examining the nutritional status of the population in many countries of the Region, and the scarcity of studies examining secular trends in nutritional indicators. Limited research funding, political

instability and conflict are a few of the challenges that some countries are facing and that may contribute to the paucity of data.

Recommendations

This review responds to the increasing demand to conduct research on research, to understand better what is already known, and to guide and inform better the development of policies and interventions (171). As such, the work undertaken in this review calls for immediate action to address the double burden of malnutrition in countries of the Region. Priority interventions should aim at improving the nutritional status of the population, particularly among vulnerable population groups, including children and women of reproductive age. The persistence of LBW and child undernutrition highlight the need for government-led interventions that apply a food systems approach in tackling malnutrition to meet the global nutrition targets by 2025. Similarly, given the observed low rates of EB, there is a need to protect, promote and support breastfeeding through the implementation of multisectoral interventions in the Region, including the development of effective culture-specific education and communication strategies. National legislation should implement the *International Code of Marketing of Breast-Milk Substitutes* and relevant World Health Assembly resolutions, with effective monitoring and enforcement. The shifts in diet witnessed by most countries of the Region, coupled with the increase in the prevalence of obesity in all age groups, highlight the urgent need to instigate government-led reformulation programmes to reduce the levels of fat and sugars in foods and drinks, implement the WHO's recommendations to restrict marketing of foods high in fat or sugar to children, and develop relevant food taxation policies (172–174). The high rates of maternal obesity and anaemia highlight the need for interventions aimed at improving maternal nutrition, given the accumulating evidence linking maternal nutritional status to increased risk of NCDs in the offspring (175). In a region that is plagued by one of the highest burdens of NCDs worldwide, nutritional, impact-driven interventions should be placed at the forefront of national agendas, not only to address all forms of malnutrition, but also to contribute towards the achievement of many Sustainable Development Goals targets, including ending poverty, ensuring healthy lives, promoting lifelong learning, improving economic growth, building inclusive societies and ensuring sustainable consumption (176).

Funding: None.

Competing interests: None declared.

Examen de la situation nutritionnelle dans la Région de la Méditerranée orientale

Résumé

L'analyse de la situation de la Région OMS de la Méditerranée orientale se concentre sur des indicateurs spécifiques relatifs à la nutrition, à savoir l'insuffisance pondérale à la naissance, l'allaitement au sein exclusif, la dénutrition et la suralimentation (indicateurs anthropométriques) et l'anémie. La prévalence régionale moyenne de l'insuffisance pondérale à la naissance et de l'allaitement au sein exclusif a été estimée à 19,31 % et 29,3 % respectivement. Le retard de croissance, l'émaciation, le déficit pondéral avaient une prévalence de 28 %, 8,69 % et 18 % respectivement. L'Afghanistan, Djibouti, le Pakistan, le Soudan et le Yémen avaient la charge la plus lourde pour le retard de croissance (plus de 30 %). La prévalence de l'anémie était comprise entre 7,4 % et 88 % chez les enfants de moins de cinq ans, et entre 19,9 % et 63 % pour les femmes en âge de procréer. L'augmentation de la tendance à la surcharge pondérale et à l'obésité chez l'adulte et l'enfant est préoccupante. La prévalence moyenne de la surcharge pondérale et de l'obésité était de 27 % et de 24 % chez les adultes, et de 16,5 % et 4,8 % chez les enfants scolarisés respectivement. Les taux d'obésité les plus élevés ont été signalés à Bahreïn, aux Émirats arabes unis, au Koweït et au Qatar. Cette analyse souligne la double charge de la malnutrition dans les pays de la Région, et appelle à donner la priorité aux politiques visant à améliorer la situation nutritionnelle des populations.

استعراض حالة التغذية في إقليم شرق المتوسط

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الخلاصة

يركز تحليل الحالة لإقليم منظمة الصحة العالمية لشرق المتوسط الوارد في هذه الدراسة على مؤشرات تغذوية محددة، وهي انخفاض الوزن عند الولادة، والرضاعة الطبيعية حصراً، ونقص التغذية وزيادة التغذية (مؤشرات أنثروبومترية) وفقر الدم. وتم تقدير المتوسط الإقليمي لانتشار انخفاض الوزن عند الولادة والرضاعة الطبيعية حصراً بنسبة 19,31 % و 29,3 % على التوالي. وبلغ متوسط انتشار التقزم والهزال ونقص الوزن 28 % و 8,69 % و 18 % على التوالي. وسُجِّل أعلى عبء للتقزم في أفغانستان وجيبوتي وباكستان والسودان واليمن (> 30 %). وتراوح معدل انتشار فقر الدم من 7,4 % إلى 88 % في صفوف الأطفال في الفئة العمرية 5 أعوام ومن 19,9 % إلى 63 % في صفوف النساء في سن الإنجاب. ويمثل الاتجاه العام المتزايد لزيادة الوزن والبدانة في صفوف البالغين والأطفال شاغلاً مقلقاً. وبلغ متوسط انتشار زيادة الوزن والبدانة 27 % و 24 % في صفوف البالغين و 16,5 % و 4,8 % في صفوف الأطفال في سن المدرسة على التوالي. وسُجِّل أعلى مستويات البدانة في البحرين والكويت وقطر والإمارات العربية المتحدة. ويسلط هذا الاستعراض الضوء على العبء المزدوج لسوء التغذية في بلدان الإقليم ويدعو إلى إعطاء الأولوية للسياسات التي تهدف إلى تحسين الوضع التغذوي للسكان.

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The development of the noncommunicable diseases emergency health kit

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Abstract

The noncommunicable diseases (NCDs) emergency health kit was developed in response to the growing prevalence of NCDs in low and middle-income countries. Under conditions of conflict or following natural disasters, regular treatment of this category of diseases is often disrupted and rarely prioritized. This leads to greater morbidity and mortality both in the short and long term. The Eastern Mediterranean Region (EMR) has both a high incidence of NCDs and currently is the site of several major conflicts and hosts most of the world's refugees. Therefore, the WHO Regional Office for the Eastern Mediterranean initiated the development of the NCD emergency health kit to provide a structured set of medications, equipment and renewables to supply the needs of a population of 10 000 people over a period of 3 months following disruption of normal medical services. This report discusses the rationale and anticipated use of the NCD emergency health kit followed by the selection criteria, structure, content and quantification process of the kit. Finally, the next steps are examined, including the procurement, logistics and monitoring and evaluation process of the kit.

Keywords: Noncommunicable diseases; humanitarian emergency; emergency kits; conflict; disaster

Citation: Slama S, Lee J, Aragno M, Laroche S, Hogerzeil, H. The development of the noncommunicable diseases emergency health kit. *East Mediterr Health J.* 2018;24(1):92–98. <https://doi.org/10.26719/2018.24.1.92>

Received: 17/12/17; accepted 18/01/18

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Introduction

Since 1984, the WHO emergency health kit, which evolved to become the Interagency Emergency Health Kit (IEHK), has provided relief for the health needs of populations in crisis (1). The intention of the kit was to temporarily provide the essential medications and supplies for a population of 10 000. This would cover a 3-month period when health infrastructure has been disrupted by conflict, or in the immediate aftermath of a natural disaster. Through its evolution, the emergency health kit has gone through several revisions and modular additions including a module for malaria treatment and a module for HIV treatment (2). Subsequent kits have been developed to serve other health needs of populations, such as the surgical kit (3) and the reproductive health kit (4).

Despite their utility, these kits have yet to address noncommunicable diseases (NCDs) in accordance with the shifting burden of diseases worldwide (5). The IEHK includes a small amount of NCD medication. However, it does not have the capacity to provide either the kind of medications needed or a sufficient quantity to treat populations that have high prevalence of NCDs, like those seen in certain low and middle-income countries (LMIC).

Noncommunicable diseases account for 70% of all deaths globally and of those deaths over 40% are premature, occurring before the age of 70. Despite the myth that NCDs are diseases of developed nations,

82% of those premature deaths occur in LMICs (6). In addition, given the scale and impact across the globe, the economic implications are significant. In 2011, the United Nations General Assembly called a high-level meeting to put NCDs on the agenda. The following year, the World Health Organization (WHO) produced the 'Global Action Plan for the Prevention and Control of Noncommunicable Diseases' as a framework for tackling this burden. Among its recommendations is Article 49, which states the deployment of "an interagency emergency health kit for treatment of noncommunicable diseases in humanitarian disasters and emergencies" (7).

The WHO Regional Office for the Eastern Mediterranean (WHO/EMRO) has taken the initiative to create an NCD emergency health kit to complement the IEHK for several reasons. First, the Eastern Mediterranean Region (EMR) has one of the highest prevalence of NCDs worldwide. With an adult hypertension prevalence ranging from 20 to 30% (8) and diabetes prevalence of 14% (9), NCDs are one of the greatest health burdens in the Region. Second, the EMR hosts the majority of the world's current refugees and internally displaced persons (IDPs) (10,11). With numerous countries in emergencies and many others hosting refugees, the Region would benefit most from an NCD emergency health kit.

The purpose of this report is to present and share the development process of the NCD emergency health kit. The report is divided into three sections: 1) it describes the rationale, purpose and anticipated use of the NCD kit; 2) it presents the structure, selection criteria, contents and

quantification process of the kit; and 3) it discusses the way forward, including the procurement, logistics, and monitoring and evaluation process of the kit at selected pilot sites.

Rationale and purpose of the NCD kit

In accordance with the minimum standards of the Sphere guidelines, the kit is built around several priority actions. First, it aims to provide the ongoing medication requirements of people who are already on treatment, in order to reduce the risk of acute exacerbations and complications that lead to morbidity and mortality. As a caveat, the kit does not support the initiation of medications for those that are newly diagnosed as outlined in the Sphere guidance notes (12). Second, the kit is meant for the primary health care (PHC) level. However, in an emergency the capacity to provide various levels of care is heavily dependent upon human resources, and often that capacity to deliver NCD care is limited among humanitarian providers. Anticipating these difficulties, the NCD emergency health kit serves a variety of health care settings. The kit can be deployed in various locations such as a mobile health clinic, primary health centre, field hospital, or if necessary in a tertiary hospital.

Structure of the kit

The NCD emergency health kit consists of 5 submodules (Table 1). Module 1A (medicines), contains mostly oral tablets alongside two different inhalers. Medicines requiring cold chain, namely subcutaneous insulin, were placed in a separate module (1B), to allow for their proper handling. The third module (1C), contains medical renewables, such as syringes, lancets and blood and urine strips. The final two modules (1D and 1E) contain equipment renewables and the equipment itself, selected for basic diagnostic ability.

The modularity of the kit was designed to offer maximum flexibility, based on country needs and capacity. For instance, the exclusion of insulin from the medicines submodule into its own cold chain submodule was a decision based on logistics and resource uncertainty in the field. Emergency situations are unpredictable and some situations may not allow for proper refrigeration facilities, which in this case, the insulin module 1B may be removed from the order. The same idea applies for the equipment renewables submodule, since it is assumed

that the medical equipment module will be ordered only once, providing the ability to order separately the renewables for those equipment. The first three modules are intended to provide sufficient medications and renewables for the 3-month initial period.

This modularity allows for flexibility in the uncertain climate of emergencies. The kit does not have to be ordered as a whole, but may be ordered by submodules depending on the needs of the field. The assumption would be that after the first order of the full kit, subsequent orders may include only the medications and renewables, excluding other longer lasting or less utilized submodules.

Content of the kit and selection criteria

The selection criteria of medicines involved several steps. First, it was important that all medicines are congruent with the WHO Essential Medicines List (13), guidelines from the 'Package of Essential Noncommunicable (PEN) Disease Interventions for Primary Health Care in Low-Resource Settings' (14), and the Mental Health Gap Action Programme (mhGAP) (15). This allows for a standardized evidence-based kit with known reliability. Following this process was a review of previous emergency health kits for the treatment of NCDs such as the Balkan kit, the NCD kit utilized in Ukraine, and the mini emergency health kit utilized in Pakistan. Finally, soliciting comments from the field in emergency countries was important in understanding the experience on the ground with regards to NCDs. An extensive literature review and a regional situational analysis on the provision of NCD care to Syrian refugees informed the prioritization of diseases to be covered (16).

Following the desk review process on 20 July 2016, a multi-agency consultation meeting involving field and technical experts of various disciplines was hosted by WHO/EMRO in Cairo, Egypt. A discussion weighing existing literature, population needs, and practical field experience was carried out. This process resulted in the finalization of the list of medications and equipment to be included in the kit. Also discussed in the meeting were the next steps, including the process of procurement, field testing, logistics, and monitoring and evaluation (M&E).

This emergency kit is designed to treat the major NCDs, namely hypertension and cardiac conditions,

Table 1 NCD emergency health kit structure and estimated weight, dimensions and volume

Basic module	Weight (kg)	Size (cm)	Volume (m ³)
Module (1A): Medicines only, without cold chain insulin	235	120 x 80 x 120	1.920
Module (1B): Medicines cold (insulin)	10	120 x 80 x 80	0.768
Module (1C): Medical renewables	21.8	60 x 40 x 42	0.1008
Module (1D): Equipment supplies	141	120 x 80 x 87	0.8352
Module (1E): Equipment	8.6	60 x 40 x 27	0.0648
Total	416.4		3.689

diabetes, chronic respiratory diseases, and a selected set of mental health and neurological diseases (Figure 1). Certain disorders such as cancers, autoimmune disorders and end-stage renal diseases require complex diagnostic infrastructures, expensive specialized care, and have treatment regimens with narrow therapeutic windows. These could result in adverse side effects not amenable to disrupted health systems. Excluding these conditions, the kit covers the essential NCD health care needs of a population with a focus on the primary health care level.

As a response to the demand for palliative care in emergencies, the kit's original intention was to include medications for both pain and non-pain related symptomatic relief, with guidance from WHO's technical report on the 'Selection and Use of Essential Medicines' (17). However, with consultations from experts and practitioners, the ultimate decision was made to exclude these medications. This was due to tensions related to regulatory restrictions and transportation impediments across different Member States, plus possible unintended consequences of controlled medications in a climate of uncertain security. This point illustrates the various dilemmas encountered in the design and selection of medicines included in the kit.

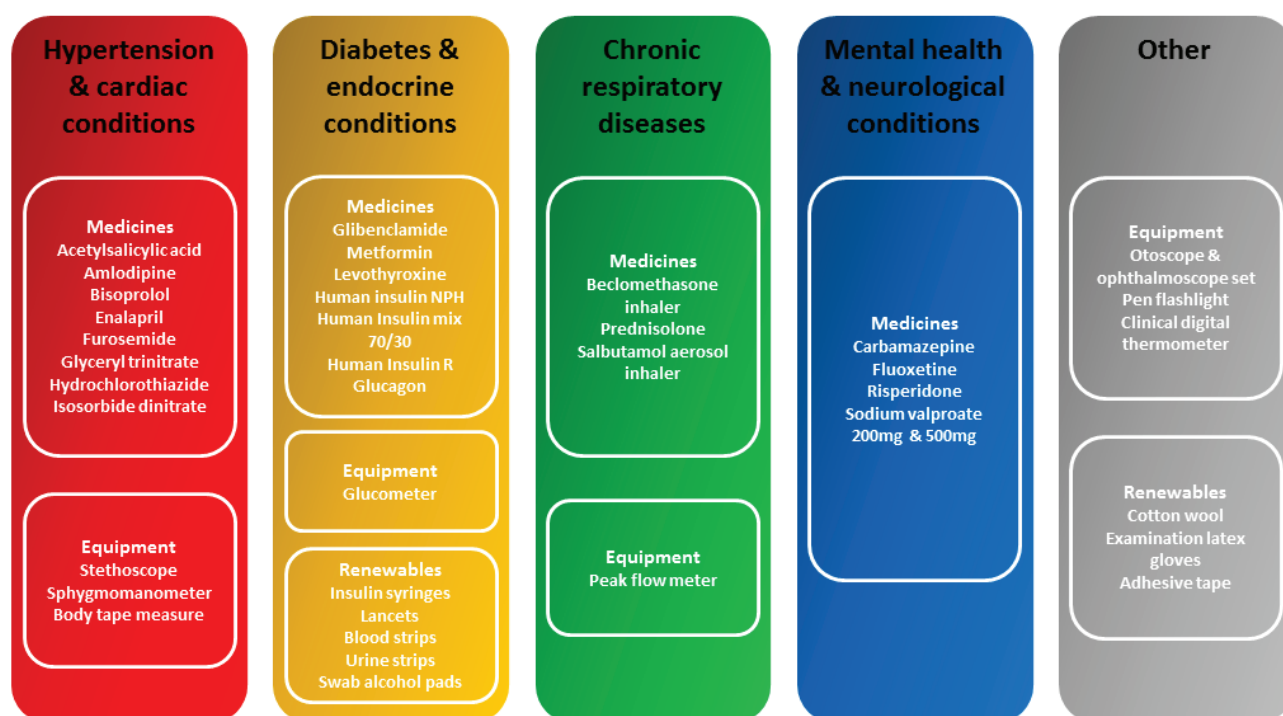
Reduction of overlap between the NCD kit and the IEHK was crucial to prevent redundant surplus of supplies in the field. For this reason, medications for eclampsia in pregnancy such as methyldopa, hydralazine and magnesium sulfate, were removed. Although the NCD kit serves to complement the IEHK, it was important for it to have stand-alone capacity and not be completely dependent on supplies included in other kits. Thus, the

inclusion of basic equipment such as sterile gloves, stethoscopes, sphygmomanometers and thermometers was strategic.

Quantification of drug requirements

The quantification of medications was based on a combination of known data and general trends. Data from WHO's NCD country profiles in the EMR were utilized to extrapolate regional prevalence and incidence of conditions (18). Upon further evaluation was the assumption regarding coverage trends, meaning the percentage of patients who are on treatment for a certain disease. For instance, at a given prevalence of diabetes there was an assumption based on trends that about 50% of patients were on pharmacologic therapy. Further assumptions were made for patients on treatment, for which the percentage of patients on insulin therapy was about 20% (19). The same process was calculated for hypertension data (20) with trends regarding the percentage of patients who are on monotherapy versus dual-therapy regimens (8). After prevalence and coverage calculations, the number of physical tablets needed was based on the WHO essential medicines list (EML) formulary to assess dosages and frequency of consumption (13). For medical equipment, further considerations were needed. Consumables such as glucose strips and syringes were based on prevalence data as mentioned above. Other devices such as glucometers, sphygmomanometers and stethoscopes were based on the number of health care professionals at facilities as well. Spare parts and consumables attached to devices were also calculated considering the lifespan of the devices.

Figure 1 NCD emergency health kit contents organized by disease area



Next steps

Procurement, logistics, monitoring and evaluation

The procurement process of the NCD kit was made through international competitive bidding. Technical specifications for all items were incorporated in the call for proposals to international suppliers. The review of suppliers' proposals involved a multidisciplinary team including physicians, pharmacists and biomedical engineers. All proposed items were evaluated against the following selection: 1) quality of the drugs; 2) compliance with the technical specifications for medical devices; 3) certifications and quality/safety assurance for medical devices; 4) drug packaging (e.g. blister versus jars); 5) total price of the kit (not module based); 6) Lead-time for the supplier to deliver the first set of kits; and 7) weight and volume.

For example, the consideration of drug packaging in jars versus blister packs were discussed, since packaging may not only affect the end prescriber and user but may also alter the weight and volume of the kit, thus having an effect on the cost and transportation. Additional considerations for devices include voltage and socket congruency and language specifications for instructions depending on the receiving country. Suppliers identified manufacturers globally and obtained price estimates. As part of the quality control process, WHO ensured that suggested manufacturers were certified by regulatory authorities and/or show adherence to WHO Good Manufacturing Practices. After selecting one supplier, WHO made a visit to the site of production to check all items included in the kit. Current cost estimates for a full kit providing for 10 000 people over a period of 3 months range from US\$ 13000 to US\$ 15000. According to the supplier, first production of kits took approximately 3 months to assemble. However, supplies are planned to be stocked by the supplier in order to guarantee rapid shipment within 48 hours.

Piloting sites and logistics

Following the selection of a supplier, discussions took place on where to first deploy the kits. The criteria for selecting pilot sites for NCD kit deployment was the following:

1. countries with high NCD burden/caseload based on reporting by partners and minimum catchment population of 10 000 people
2. NCD medicines shortage/supply chain disruption
3. minimum technical capacity to deliver NCD medicines
4. cold chain structure/equipment availability
5. capacity to provide basic feedback on kit use (monitoring and evaluation activities).

Based on these criteria, a choice was made to start implementation of the kit in several sites across Iraq and the Syrian Arab Republic. The first set of kits reached

the north of the Syrian Arab Republic in October 2017. In order to set the baseline for sites' selection and to start gathering information for deployment plan development, a comprehensive questionnaire has been sent to each of the selected sites. This involved finalizing the quantity of orders, producing a distribution plans for each site, and foreseeing any obstructions. The number of kits to be ordered required an estimate of the catchment area population served by each health facility. In addition, the number of kit modules orders was tailored to the size of the population and patient volume to be served. Given the nature of conflict and insecurity, an additional number of kits were ordered as a buffer stock to ensure continuity of care as unpredictable patency of humanitarian corridors could impede delivery. Movements across borders depend on the export and import country; further steps were necessary including registration of suppliers within the import country, certification of medications, and proper documentation for cross border activities.

Monitoring and evaluation

Following up on the NCD kit's usage is an integral process. By obtaining proper feedback and data, critical information will be obtained on whether the kit content and quantities served the needs of the population as originally intended. Particularly after the first launch of the kit, proper data collection and analysis will be essential to guide future revisions. This process will not only inform the production of a more cost-effective kit, but more importantly create a kit that can best serve populations in emergencies.

For that purpose, a monitoring and evaluation framework was designed that follows the journey of the kit from the supplier to end-user. Monitoring and Evaluation (M&E) activities were divided into 3 phases: 1) a pre-deployment phase; 2) a mid-term monitoring phase; and 3) an end-term evaluation phase. Survey questionnaires were developed and connections with first-line service providers were set up to get regular feedbacks. Anticipating that insecurity would hamper the ability to perform direct visits to implementing sites, an electronic platform and mobile applications were set up to allow remote monitoring of the kit deployment and use. Consisting of a comprehensive suite of tools, the electronic platform would allow for the remote administration of surveys, export of data, and visualization of results. The M&E timeline and type of data collected during the various implementation phases are outlined in Table 2.

Discussion

"Health system resilience can be defined as the capacity of health actors, institutions, and populations to prepare for and effectively respond to crises; maintain core functions when a crisis hits; and, informed by lessons learned during the crisis, reorganize if conditions require it" (21).

During emergencies, lives are lost primarily to the effect of the environment, communicable diseases

Table 2 Monitoring and Evaluation timeline at pilot sites

NCD kit M/E phases	Pre-deployment phase Day 0	Mid-term monitoring 3 months	End-term evaluation 6 months
When	Upon kit arrival and before its use	At 3 months of kit arrival	At 6 months of kit arrival
Objective	<ul style="list-style-type: none"> - To provide a starting baseline for kit use - To be informed about parallel supplies and document storage capacity and conditions - To verify NCD kit has reached its final destination 	<ul style="list-style-type: none"> - To follow up kit use in particular in term of content and quantification against ordered numbers of complete kits/ submodules 	<ul style="list-style-type: none"> - To review NCD kit structure, content and quantities adequacy to field needs against pre-existing readiness and estimated needs
Areas covered by monitoring and evaluation	<ul style="list-style-type: none"> - Contextual analysis (emergency, service delivery readiness relevant to NCD management) - Baseline assessment (drugs stocks, storage capacity, cold chain) - Kit inspection upon reception 	<ul style="list-style-type: none"> - Relevance of kit content to daily practice - Early stock-outs or non-used items 	<ul style="list-style-type: none"> - Relevance of kit content for the management of most common NCDs - Relevance of drug quantities to estimated population coverage - Relevance of kit modularity and drug packaging - Relevance of supportive documentation (drug formulary, standards treatment guidelines) to local practice
Methods	E-survey	Follow up calls to piloting sites	E-survey
Focal points to collect data	pharmacists/logisticians	Medical officer or third party in charge of the supervision of primary health care facility	Medical officer or third party in charge of the supervision of primary health care facility

and trauma. Humanitarian objectives aim to reduce as many of these excess deaths as possible. However, it is important to address not only the new diseases but also the existing health burdens prior to the emergency. Noncommunicable diseases, a group of diseases that encompass a wide spectrum of pathologies, are particularly difficult to address even in a functioning health systems. Some of the problems may have been addressed, but with others falling by the wayside due to limited infrastructure and resources. During emergencies when health systems have been disrupted, even basic health needs may not be addressed and lead to an exacerbation of existing burdens. Inevitably, these diseases, traditionally not foreseen by humanitarian actors, contribute to significant levels of morbidity, disability and mortality.

The need to bridge together the humanitarian objectives and development objectives are integral in rebuilding health systems. However, the NCD kit was not intended to address the multiple disruptions health systems face at a time of an emergency. Under the framework of the health system's building blocks, the primary purpose of the kit was to respond to supply

chains disruption, providing a core set of essential medical supplies for the management of the most common NCD conditions. Focusing on the most common NCDs, the kit supports countries in providing continuity of care for people already treated for NCD conditions; thus, preventing acute exacerbations that would put an exponential burden on health systems.

By these means, it is expected that the kit not only improves the provision of essential services during acute emergency responses, but also paves the way for health system recovery. Therefore, it would anticipate the restoration of a regular PHC service delivery system with a focus on the most cost-effective NCD interventions, as recommended by WHO (22). By stockpiling medicines during, or even before emergencies, the kit can help countries mitigate disruptions in the future. Finally, from a funding perspective, in a climate when NCD care is on many donors' agendas, the kit can be an advocacy tool to prioritize the most cost-effective interventions and to orient donor funding for NCDs in humanitarian responses.

Funding: None.

Competing interests: None declared

Élaboration d'un kit sanitaire d'urgence pour les maladies non transmissibles

Résumé

Le kit sanitaire d'urgence pour les maladies non transmissibles (MNT) a été mis au point en réponse à l'augmentation de la prévalence des MNT dans les pays à revenu faible et intermédiaire. Dans les situations de conflit ou à la suite de catastrophes naturelles, les traitements réguliers pour cette catégorie de maladies sont souvent interrompus et la priorité leur est rarement donnée. Ceci conduit à une morbidité et une mortalité plus élevées, tant sur le court terme que sur le long terme. Non seulement la Région de la Méditerranée orientale affiche une incidence élevée pour les MNT, mais elle est aussi actuellement le lieu de plusieurs conflits de grande ampleur et accueille la plus importante population de réfugiés au monde. Pour cette raison, le Bureau régional de l'OMS pour la Méditerranée orientale a amorcé l'élaboration d'un kit sanitaire d'urgence pour les MNT afin de fournir un ensemble structuré de médicaments, de matériel et de fournitures renouvelables permettant de répondre aux besoins de 10 000 personnes sur une période de trois mois après l'interruption des services médicaux normaux. Le présent rapport examine les raisons de l'élaboration d'un kit sanitaire d'urgence pour les MNT et la façon dont il pourra être utilisé, ainsi que les critères de sélection, sa structure, son contenu et ses processus de quantification. Enfin, les dernières étapes sont examinées, notamment l'achat, les aspects logistiques et les processus de suivi et d'évaluation du kit.

تصميم عدة المستلزمات الصحية الطارئة للأمراض غير السارية

سليم سلامة، جوناثان لي، موريتشو أرانيو، صوفي لاروش، هانز هوجرسايل

الخلاصة

صمّمت عدة المستلزمات الصحية الطارئة للأمراض غير السارية لمواجهة تزايد انتشار هذه الأمراض في البلدان ذات الدخل المنخفض والمتوسط. ففي حالات الصراع أو في أعقاب الكوارث الطبيعية، غالباً ما يتعرض العلاج المنتظم لهذه الفئة من الأمراض للانقطاع وقلماً يُعطى الأولوية. ويؤدي ذلك إلى زيادة معدلات المراضة والوفيات بصورة حادة وعلى المدى البعيد كذلك. ويتسم إقليم شرق المتوسط بارتفاع معدلات الإصابة بالأمراض غير السارية بل وأصبح في الوقت الحالي مسرحاً لعدة صراعات كبرى ومأوى لمعظم لاجئي العالم. وعلى ذلك، استحدث مكتب منظمة الصحة العالمية لإقليم شرق المتوسط عدة المستلزمات الصحية الطارئة للأمراض غير السارية بغية توفير مجموعة مهيكلية من الأدوية والأجهزة والمستلزمات المتجددة لتلبية احتياجات ١٠٠٠٠ شخص لفترة ٣ أشهر عقب انقطاع الخدمات الطبية المعتادة عنهم. ويناقش هذا التقرير الأساس المنطقي لتصميم عدة المستلزمات الصحية الطارئة للأمراض غير السارية والاستعمال المتوخى لها، وبعدها يتناول معايير اختيارها وهيكلتها ومحتواها وعملية التحديد الكمي لها. وأخيراً، ينظر التقرير في الخطوات المقبلة، بما في ذلك عملية الشراء والأمور اللوجستية وعملية الرصد والتقييم الخاصة بمجموعة المستلزمات.

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GABRIC Diabetes School: an innovative education centre for people with diabetes

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Abstract

Diabetes prevalence and deaths attributable to diabetes continue to rise across globally. Diabetes Self-Management Education and Support (DSME/S) is a critical resource designed to help people with diabetes (PWD) successfully self-manage their disease; however, its utilization is too low. In the Islamic Republic of Iran, there are currently limited structured educational programmes and no national standards for DSME/S protocol. In response to this, the GABRIC Diabetes Education Association (GDEA) has been developed as a school for diabetics, which has a comprehensive DSME/S programme for PWD with 18 distinct courses on 5 levels for 8 target groups. In addition, GABRIC has developed a database registry with more than 100 000 members throughout the country, of whom 95% are diabetic with a proportion of 82% Type 2 diabetes and 13% Type 1 diabetes. The success of the GABRIC school model results is yet to be investigated through study trials, and offers a fruitful line of research.

Keywords: Diabetes, diabetic, education, self-management, noncommunicable diseases

Citation: Esteghamati A, Hosseinpanah F, Adel Jahed S, Harati H, Astaneh MTCB, Kaykhanzadeh H, et al. GABRIC diabetes school: an innovative education centre for diabetics. *East Mediterr Health J.* 2018;24(1):99–103. <https://doi.org/10.26719/2018.24.1.99>

Received: 06/01/18; accepted: 17/01/18

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Introduction

Diabetes is one of the largest global health emergencies of the 21st century and the epidemic is expected to continue (1). Diabetes prevalence, deaths attributable to diabetes, and health expenditure due to diabetes continue to rise across the globe with important social, financial and health system implications (2). Despite the fact that Diabetes Self-Management Education and Support (DSME/S) is such a critical resource to help people with diabetes successfully self-manage their disease, its utilization is too low (3,4). DSME/S are essential elements of diabetes care that have been shown to improve the haemoglobin A_{1c} (HbA_{1c}) level by as much as 1% in people with Type 2 diabetes (T2DM), aside the positive effects on other clinical, psychosocial, and behavioural aspects of diabetes (5,6).

Qualitative studies have shown that educational barriers are among the main perceived barriers for patients with diabetes (7). Despite this fact, there are limited educational programmes in the Islamic Republic of Iran for people with diabetes and no national standard DSME/S protocol has been implicated in the country (8). Shakibzadeh et al. developed a Persian DSME and evaluated its efficacy (8). Thus, the GABRIC Diabetes Education Association (GDEA) was developed with a comprehensive DSME/S programme to provide education and support for all people with diabetes (PWD). Founded in 2006 in Tehran, GDEA is a nongovernmental organization and an official member of the International Diabetes Federation (IDF). It was developed by a group of endocrinologists and young “well controlled” patients

with Type 1 diabetes (T1DM). GDEA has subsequently flourished and seeks to improve the lives of PWD and to promote primary, secondary and tertiary diabetes prevention via education, raising awareness, and building motivation. Having T1DM has always been an important recruitment criteria; a notion that has proved necessary for delivering an empathetic education and support.

GABRIC’s mission and vision

GABRIC’s mission and vision can be summarized by the following: “In GABRIC we strive to proscribe diabetes complications by prescribing awareness and motivation”, and “We Gabricians will create a future in which diabetes will no longer be a serious public concern and all persons with diabetes can live a productive and fulfilling life.”

Building motivation: a psychological recruitment strategy

The American Diabetes Association (ADA) recommends that all PWD should receive DSME (9), but evidence shows that the utilization of DSME is still too low. Therefore, programmes need to become more innovative regarding ways to attract PWD (3,4,10), who often strongly believe that they get the DSME they need from their physicians (10), making it a difficult task to convince them to participate in DSME/S programmes.

Although engaging PWD in DSME/S is not an easy task in the Iranian/Middle Eastern culture, GABRIC has utilized “empathy” by peers as a motivating factor for PWD to become active members of their treatment

team; i.e., the contact point of every PWD would be a well-controlled peer, who has been trained to provide empathy and lead peer support through an interactive motivational interview, and convince the PWD to get involved in the DSME/S programme.

Collective education: learning with a diabetes educator and building skills with peers

GABRIC DSME has been delivered via a “diabetes school” model, categorized into 18 distinct courses at 5 levels including elementary, intermediate, advanced and complementary. Thus, covering the educational needs for 8 target groups including PWD, the population at risk of diabetes, as well as care givers and healthcare professionals (HCP) (Table 1).

There is growing evidence for the role of peers and lay leaders in providing ongoing support (11). The World Health Organization (WHO) Consultation on Peer Support Programmes in Diabetes documents the promise of peer support as an effective approach to chronic disease management and health promotion (12). Peer support could allow patients to share experiences and receive the reinforcement that is not attainable from time-pressed clinicians, and it may especially benefit patients who are tackling challenging medical tasks, such as insulin management (13).

The majority of the staff at GDEA have T1DM, some of whom are trained in the role of peer support. They will provide motivation, facilitate skill trainings (e.g., insulin injection and self-monitoring of blood glucose), and provide ongoing support through follow-up contact. The implementation of active peer support to facilitate behaviour change through motivational interviewing is the cornerstone of GABRIC DSME/S. Moreover, GABRIC’s diabetes education advisory committee – involving endocrinologists, nutritionists and PWD in defining educational policies – provides the opportunity for a multi-aspect approach to the standard DSME instructed by diabetes educators.

Experiential learning model

In the four-stage experiential learning model, personal experience is the key to behaviour change and self-efficacy. Therefore, people need to actively be involved in the situation and it is up to the educator to facilitate the learning process (14). Diabetes educators in GABRIC’s group education classes use the “Experiential Learning Model” along with homework, logbooks, reviews, case studies and role modeling to involve people in the problem-solving process and use real situations to help learners gain insight (15).

Patient specific education path: education is individualized

GABRIC Diabetes School has 18 distinct courses in elementary, intermediate, advanced and complementary

levels. Every person with diabetes might be included in a specific education path based on their needs. For example, an adult with T2DM will have a specific education path including weight management, ABC’s of diabetes and stress management, while a child with T1DM will have their own specific education path including the “Keepo Adventure” course.

A distinct special level is also defined that includes national programmes as well as HCP training courses including “Basics of Diabetes Education” (a 15-hour long course for diabetes educators), and a “Diabetes Ambassadors Workshop” that is specifically designed to train nurses regarding communication skills and strategies to prevent diabetes emergencies. Insulin My Friend (IMF) is a national campaign specifically designed for deprived areas across the Islamic Republic of Iran. It started as a 2-day educational campaign targeting persons with T1DM and HCPs in 2011. Recently, this course has been expanded to a 3-day education programme to cover people with T2DM and primary health care providers; up until now 16 cities have been covered across country, totaling 2800 PWD and 2000 HCP involved in this educational campaign, using 23 000 man hours.

“Keepo Adventures”: empowering children and families

Schoolchildren depend on peer decision-making in their daily lives. They need age-adapted information on the disease, its treatment, and the appropriate conduct in difficult situations such as hypoglycaemia. Although the main responsibility for the therapy lies with the parents, every child in this age group is offered a structured education that promotes a secure childhood with as few restrictions as possible (16,17). The “Keepo Adventures” course, a 6-hour training course conducted through two sessions one week apart, has been designed to fulfill the educational needs of children aged 7 to 12 years. It comes with counseling sessions for parents in order to learn how to deal with their new family life and acquire age-adapted information on diabetes management.

The Keepo cartoon character, developed in 2011 with an Iranian name meaning “butterfly” has T1DM and has arrived from an imaginary planet named Sugarland. The antennas on Keepo’s head indirectly represent the body organs and highlight inappropriate glucose management through their disappearance. The presence of an imaginary character in Keepo Adventures courses develops the empathy of children, welcoming it as an intimate friend and will help them follow Keepo’s rules.

Organized data registry

During its years of activity, GABRIC has developed a database registry with more than 104 000 members throughout the Islamic Republic of Iran, 95% of whom have diabetes based on self-discretion with a female/male ratio of 1/1. 70% of members reside in Tehran. Our data registration reports the T2DM and T1DM population to be around 82% and 13% respectively. Around 5% have other

Table 1 GABRIC diabetes school model

Course title	Target group	Number of sessions	Comments
Elementary			
Elementary (E)	*	1	Motivating diabetic patients in order to control diabetes, improving/modifying misconceptions, familiarization with factors affecting blood glucose, emphasizing continuous visits to the doctor.
Keepo Adventures (E-KA)	D	2	Motivating and educating diabetes self-management skills for children.
Gestational diabetes (E-GDM)	H	1	Healthy nutrition and physical activity recommendations, familiarization with misconceptions, promoting mother and baby health.
Intermediate			
Type 1 (I-T1)	A, E	3	Knowing diabetes, the importance of self-glucose monitoring, hypoglycaemia, principles of nutrition therapy, carbohydrates, the importance of weight loss, the ABC of diabetes management, prevention of complications and self-care, physical activity, insulin injection techniques and different types of insulin.
Type 2- Insulin (I-T21)	B	3	
Type 2- Oral Agents (I-T20)	C	2	
Advanced			
Type 1 (I-T1)	A, E	2	Meal planning in practice, practical carbohydrate counting, exercise programme, pattern management of SMBG results and insulin adjustment, questions and answers, travelling tips, hypoglycaemia prevention in exercise and sick day care.
Type 2- Insulin (I-T21)	B	2	
Type 2- Oral Agents (I-T20)	C	2	
Complementary			
Stress management (C-SM)	*	1	Familiarization with stress and its symptoms, methods of stress management, practical techniques of relaxation, practical techniques of relaxation.
Weight management (C-WM)	*	1	Motivating in order to achieve the desired weight, how to reduce the energy intake, physical activity principles.
ABC (A1C, blood pressure, cholesterol control in diabetes (C-ABC)	*	1	Modifying life style and nutrition in order to control blood pressure, lipids and glucose.
Parent discussion club	E	2	Familiarization with each other and sharing their experiences, presenting practical and psychological methods for effective management of children's diabetes.
GABRIC support session	A	2	Utilizing advanced carbohydrate counting skills, problem solving, individualized SMART goal setting, promoting self-assessment and informed decision-making.
Special			
Health nutrition and diabetes prevention (S-HNDP)	G	1	Introducing practical ways for health nutrition and increasing physical activity to prevent diabetes and promote healthy lifestyle.
Insulin my friend (S-IMF)	A, F	4	A creative educational campaign targeting T1 diabetics and diabetes educators.
Basics of diabetes education (S-BDE)	F	4	Training diabetes educators to get familiar with the educational challenges of diabetics, how to teach scientific concepts in plain language, how to teach necessary skills to patients.
Diabetes ambassadors workshop (S-DAW)	F	1	An educational course for nurses focused on diabetes emergencies (hypo- and hyperglycaemic), sick day management and communication skills.

*Courses are free of charge due to support from donors and corporate sponsors.

A = People with Type 1 diabetes

B = People with Type 2 diabetes on insulin

C = People with Type 2 diabetes on oral therapy

D = Children with Type 1 diabetes

E = Parents of children with Type 1 diabetes

F = Health care professionals

G = General and risk population

H = Mothers diagnosed with GDM

specific types of diabetes. Up until January 2017, our total man-hours of education was 338 268.

GABRIC's educational model was selected as the best practice of diabetes education in the Middle East and North Africa (MENA) region in 2010 by the MENA Diabetes Leadership Forum (18). In 2016, GDEA was

invited to attend WHO's World Health Day event in Geneva, Switzerland, to present its diabetes school model.

Limitations

It is expected that DSME/S programmes result in behaviour change; whether the GABRIC Diabetes School

model as a structured DSME/S facilitates behaviour change is yet to be investigated through research protocols. Although evidence shows that engaging DSME programmes results in a reduction in HbA1c levels in people with T2DM (19), whether our designed

DSME/S programme results in HbA1c reduction, lifestyle and psychological outcomes need to be determined by research. The same concept also applies to the role of empathy and peer support in motivating and engaging PWD in our DSME/S.

Funding: None.

Competing interests: None declared

GABRIC, l'école du diabète : un centre d'éducation pour diabétiques innovant

Résumé

La prévalence du diabète et les décès attribuables à cette maladie continuent d'augmenter dans le monde. L'éducation et l'appui à l'auto-prise en charge du diabète constituent une ressource essentielle mise au point pour aider les diabétiques à prendre en charge eux-mêmes leur maladie. Cependant, le recours à cette méthode reste trop faible. En République islamique d'Iran, les programmes d'éducation structurés sont actuellement en nombre limité, et il n'existe pas de normes nationales pour les protocoles d'éducation et d'appui à l'auto-prise en charge du diabète. Pour combler cette lacune, l'Association GABRIC d'éducation au diabète a été créée afin de jouer un rôle d'école pour diabétiques. Elle propose un programme complet d'éducation et d'appui à l'auto-prise en charge du diabète, composé de 18 cours distincts répartis en cinq niveaux destinés à huit groupes cibles. En outre, GABRIC a établi un registre de bases de données comprenant plus de 100 000 membres à travers le pays, dont 95 % de diabétiques, avec une proportion de 82 % de diabète de type 2, et 13 % de diabète de type 1. Le succès des résultats du modèle de l'école GABRIC reste à être examiné au moyen d'essais, et offre un axe de recherche constructif.

مدرسة جابريك لمرضى السكري: مركز ابتكاري لتثقيف مرضى السكري

علي رضا استقامتي، فرهاد حسين پناه، سيد عادل جاهد، هادي هراتي، محمد تقى چراغچى استانه، هرمز كيخان زاده، سارا صداقت

الخلاصة

لا يزال معدل انتشار داء السكري والوفاة الناجمة عنه آخذاً في التزايد في جميع أنحاء العالم. وتمثل أداة التثقيف والدعم للمعالجة الذاتية من داء السكري مورداً بالغ الأهمية يهدف إلى مساعدة مرضى السكري على النجاح في معالجة مرضهم بأنفسهم؛ ولكن يبقى مستوى الاستفادة منه متدنياً للغاية. وفي جمهورية إيران الإسلامية، لا يوجد في الوقت الحالي سوى عدد محدود من البرامج التثقيفية المنظمة ولا تطبق معايير وطنية بشأن بروتوكول التثقيف والدعم للمعالجة الذاتية من داء السكري. واستجابةً لذلك، صُمم "اتحاد جابريك للتثقيف بشأن داء السكري" ليكون بمثابة مدرسة لمرضى السكري، تطبق برنامجاً شاملاً للتثقيف والدعم للمرضى يتضمن 18 دورة تثقيفية منفصلة على 5 مستويات لثماني مجموعات مستهدفة. وعلاوةً على ذلك، عمدت جابريك إلى تصميم سجل قاعدة بيانات يتضمن أكثر من 100 000 عضواً في جميع أنحاء البلد، 95٪ منهم من مرضى السكري، و 82٪ من النوع الثاني و 13٪ من النوع الأول من داء السكري. ولم يتم التحقق من نجاح نتائج نموذج مدرسة جابريك بعد ولكن من المقرر أن يتم ذلك عن طريق إجراء تجارب ودراسات، ويعد نجاحه بسلسلة مثمرة من البحوث.

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Scaling up cancer care in the WHO Eastern Mediterranean Region

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Keywords: cancer; diabetes, cardiovascular diseases; noncommunicable diseases; policy

Citation: Lyons G, Sankaranarayanan R, Millar AB, Slama S. Scaling up cancer care in the WHO Eastern Mediterranean Region. *East Mediterr Health J.* 2018;24(1):104–110. <https://doi.org/10.26719/2018.24.1.104>

Received: 17/12/17; accepted: 08/02/18

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Introduction

The burden of cancer in the Eastern Mediterranean Region (EMR) is predicted to double by 2030. Therefore, a strategic approach to scaling up cancer control in the Region is required. Currently, less than half of the countries in the Region have adopted a planned approach to cancer control, and access to cancer services is extremely variable. Early detection strategies often focus on screening rather than early diagnosis methods. Treatment access is varied, and half of the countries do not have guidelines in place for cancer treatment and referral. Other barriers to treatment include a lack of multi-disciplinary teams, limited access to cancer surgery, radiotherapy and medicines and a lack of specialist surgeons, oncologists and support staff. Similarly, palliative care access is challenging due to limited funding, inadequate training, insufficient staff and a lack of access to important pain relief medications. Global efforts to address noncommunicable diseases (NCDs), including cancer, are gaining momentum for countries at all levels of development, and cancer management and technologies are rapidly advancing. However, it is important that approaches are tailored to country settings, to ensure cost-effective use of modest budgets in low-resource settings.

The WHO EMR is made up of 22 countries in the Middle East and North Africa, with a total estimated population of 620 million (1). However, there is substantial variation in terms of population health outcomes, health care infrastructure and quality and level of health expenditure. This variability is largely related to economic development in a region that consists of low, middle and high-income countries (2). Furthermore, the backdrop of political instability, conflict and cultural practices presents a number of development challenges.

The Region, like much of the world, is experiencing an epidemiological transition from communicable diseases to NCDs such as cardiovascular diseases, diabetes and cancer (3). Many factors are contributing to this, including an ageing population and increasing levels of unhealthy lifestyle behaviours such as smoking, poor diet and inactivity. Indeed, more than 65% of deaths in the EMR are now directly attributed to NCDs (4).

Cancer is one of the four major killers in the Region and results in nearly 400 000 deaths every year. Notably, the number of cases is projected to increase dramatically over the next 15 years, with the EMR expected to have the highest estimated increase in cancer burden of all six WHO regions. Furthermore, survival rates in the EMR are lower than in Europe and in the Americas, because patients usually present at a late stage when cancer is likely to be incurable (5).

However, many countries in the Region are working to reduce the burden of cancer and improve the availability of diagnostic tests, treatments and palliative care services. This commentary describes the cancer burden in the Region and the status of cancer control, including policies, early detection, treatment and palliative care. It outlines the need to scale up cancer control in the EMR, and also proposes a new regional framework for action on cancer control.

Cancer burden in the Region

Estimates from the International Agency for Research on Cancer (IARC) indicate around 293 000 newly diagnosed cancer cases among women in the EMR in 2012 (5), and a total of 176 000 women died of the disease. In the same year, the estimated numbers of cancer cases and deaths in men were 263 000 and 191 000 respectively. The five most common sites of cancer in men are lung, urinary bladder, liver, prostate and colorectal. Among women, breast cancer accounted for almost a third of all cancers followed by cervix and colorectal cancer. In 2012, breast cancer was the leading cause of cancer mortality (42 000 deaths) in the Region, followed by lung cancer (29 000 deaths) (5).

Furthermore, it has been projected that the burden of cancer will increase substantially in the period 2012–2030. Modelled figures suggest that cancer incidence and deaths will almost double, with 555 000 new cases of cancer in 2012, compared to a prediction of 961 000 new annual cancer cases by 2030. This is the highest projected increase of all six WHO regions (5). Population growth and increasing life expectancy are the main drivers behind most of the increase of cancer cases. However, lifestyle risk factors, including tobacco use, unhealthy

diets, rising obesity, and insufficient physical activity levels contribute to these trends, offering entry points for preventive policies.

Notably, cancer survival rates in the EMR are lower than in the western regions, such as the Americas and Europe. Specifically, in the EMR there is a cancer death per 1.5 cancer cases, whereas in the Americas there is only one cancer death for every 2.2 people diagnosed (Table 1). Therefore, although the absolute number of cancer cases and deaths is much higher in the west, a person diagnosed with cancer in the EMR region is almost twice as likely to die, than a person diagnosed in the Americas.

Furthermore, there is substantial diversity of cancer profiles between EMR countries according to level of human development. For example, higher proportions of cervical cancers are found in countries with lower levels of development, such as Somalia or Djibouti while higher income countries record a higher proportion of colorectal cancers (6).

Status of cancer control in the Region

The status of cancer control in the Region varies by component, such as governance, early detection, treatment, palliative care and surveillance, and also by country. Broadly, all 22 countries in the Region

are categorized into three groups based on level of development and income (2). Group 1 countries are the most developed, with increasing rates of NCDs, such as Bahrain and Qatar. The countries in group 2 are middle income, including Egypt and Morocco, whereas group 3 countries tend to be low-income, including Afghanistan, Sudan and Yemen. While all countries in the Region face challenges with regard to cancer care, these tend to vary with level of development, as well as conflicts and refugee situations.

Policies and planning

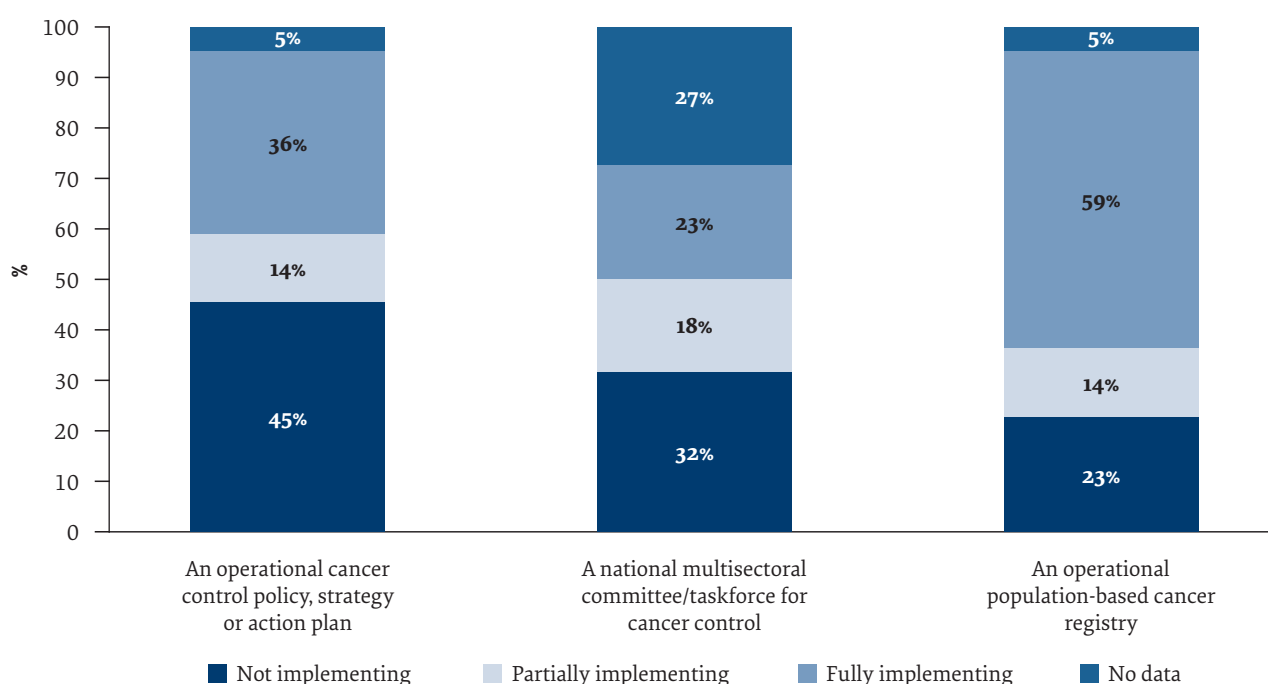
In 2005, a World Health Assembly resolution determined that all countries should implement a national cancer control programme (WHA58.22) (7). Further to this, given the resource limitations in all countries, it was proposed that they set up a National Cancer Control Committee to prioritize interventions, treatments and best use of resources, at the country level. Although some progress has been made in these areas, it has generally been slow in the Region.

Eight countries in the Region have an operational policy or strategy on cancer control, and three are partially implementing one; however, the remaining 10 member states (45%) have not commenced implementation of a cancer strategy (Figure 1) (8). Furthermore, a multisectoral

Table 1 Cancer incidence and mortality by WHO region, IARC Globocan, 2012 (5)

Cancer epidemiology	Africa (AFRO)	Americas (PAHO)	Eastern Mediterranean (EMRO)	Europe (EURO)	Southeast Asia (SEARO)	Western Pacific (WPRO)
Incidence	645 071	2 882 425	555 318	3 714 707	1 724 332	4 543 359
Mortality	455 695	1 294 866	367 441	1 932 760	1 171 282	2 978 084
Ratio (deaths : cases)	1 : 1.4	1 : 2.2	1 : 1.5	1 : 1.9	1 : 1.4	1 : 1.5

Figure 1 Proportion of countries in the Region implementing policy protocols for cancer control (7)



committee for cancer control is only available fully in five countries and partially in four. Although data is not available for all countries, at least seven Member States have not yet convened a committee. However, the majority of EMR countries (73%) have a population-based cancer registry in place, covering a region (e.g., Karachi in Pakistan or Gharbiah registry in Egypt) or the whole country (e.g., Kuwait).

Early detection of cancer

One of the key areas of cancer control is early detection. This is the process of detecting the disease in its early stages when patients have higher survival rates. Early detection of cancer can be achieved through two methods: screening asymptomatic persons at a population-level, and early diagnosis of symptomatic patients (9). For early detection to be effective, integration with primary care is important, ensuring the rapid identification of symptoms, and prompt referral for diagnostic tests once cancer is clinically suspected. However, the integration of early detection into primary health care is limited in most countries in the Region, particularly low and middle-income countries (Table 2).

In January 2016, a consultative meeting was held to discuss the early detection and screening of priority cancers in the EMR (10). The two-day expert consultation was attended by a number of regional and international experts, and the recommendations included the development of policy briefs on five key cancers, which have since been published (11).

The five identified most common cancers amenable for early detection in the Region are breast, colorectal, cervical, prostate, and oral cancers. These five were identified based on their incidence and/or amenability to early detection. Breast cancer is the most common cancer among women and increasing in incidence in all countries of the Region, while colorectal and prostate cancers are also increasing in incidence. Furthermore, oral cancer is common in some countries due to the high prevalence of tobacco, *toombak* and *qat* chewing. Cancer of the uterine cervix is low in incidence in the Region; however, it is one of the most suitable cancers for screening interventions.

Breast cancer is amenable to early diagnosis, and prognosis can improve substantially if it is picked up early. There are some good examples of breast cancer early diagnosis initiatives in the Region. Jordan and Morocco provide good models for scaling up of breast

cancer early detection in low- and middle-income countries worldwide. In Jordan, an education and awareness campaign has resulted in more early stage diagnoses and fewer breast cancer diagnoses at later stages, thus increasing survival rates. Between 2005 and 2009, the proportion of stage III diagnoses declined from 56% to 23% (12). Similarly, a nationwide awareness programme was implemented in Morocco, in addition to education for healthcare professionals, increasing early stage diagnoses of breast cancer (13).

While early diagnosis programmes have proven effective, evidence for population-level breast screening programmes is contentious, with a risk of over-diagnosis, and requiring substantial investment (14). Population-level mammography screening programmes have been initiated in many countries in the Region, however they generally have limited coverage and there has been little evidence to support their effectiveness to date (7). For example, a programme implemented in Bahrain in 2005 has had little impact on early diagnoses, which has been attributed to inconsistent performance and inadequate coverage (15,16). Furthermore, in Qatar and Saudi Arabia, the ineffectiveness of breast screening services was attributed to low awareness of the general population and therefore inadequate participation (17,18).

Even though some countries are implementing population-level screening programmes, the greatest impact on downstaging of cancer diagnoses in the Region has been galvanized through early diagnosis programmes, such as the examples on breast cancer in Jordan and Morocco. All countries can take steps to improve early diagnosis of cancer, this would require more focus on three critical elements: a) improving public awareness of different cancer symptoms and encourage people to seek care when these arise, and fighting stigma and cultural barriers; b) promoting health professional education on early signs and symptoms of common cancers, for prompt referral of symptomatic patients to diagnostic and treatment services; and c) investing in health services so that symptomatic patients receive timely diagnoses and access to safe and effective treatment without incurring prohibitive costs.

In summary, it is more cost-effective nationally, and better for patients individually, to diagnose cancer earlier and treat it effectively. This will result in increased survival rates, improved quality of life and lower cancer mortality. This reduces the burden of cancer on governments, as well as individuals and their families,

Table 2 Early detection of cancer integrated with primary health care (7)

Country group	Primary health care service integration of early detection of cancers by means of rapid identification of the first symptoms (availability, proportion of countries in the Region)				
	Breast	Cervix	Colon	Prostate	Oral
Group 1	100%	67%	100%	100%	50%
Group 2	70%	40%	10%	0%	0%
Group 3	17%	17%	0%	0%	17%
Total	64%	41%	32%	27%	18%

while also contributing to international progress on NCDs.

Cancer treatment

Cancer treatment outcomes depend largely on two factors: stage at presentation and the availability of the required treatment services. Essential services include surgery, radiotherapy and systemic treatment with chemotherapeutic or hormonal agents. Approved national guidelines for cancer referrals and management are key elements of cancer control, ensuring a consistent and evidence-based best-practice approach to cancer care. However, this is an area of the cancer pathway in the EMR that needs more attention (Figure 2). Only around half of the countries in the Region have approved guidelines, most of which are high-income and upper middle-income countries. Comparatively, among lower income countries (group 3), only 17% have approved cancer management guidelines and none have protocols for onward referrals post-diagnosis.

Furthermore, service models incorporating multidisciplinary teams (MDTs) are important to ensure effective access to all treatment needs and continuity of care. MDTs involve specialties such as pathology, radiology, surgical, medical and radiation oncology. Certain countries in the Region, such as Jordan and Oman,

have implemented MDTs in their model of cancer care. However, others including Pakistan and Sudan have not established multidisciplinary teams in their care pathway (19). There could be a number of reasons for this, including a lack of diagnostic facilities and/or treatment modalities.

Availability of cancer medicines is a challenge for several countries in the Region and access varies substantially by country (Table 3). Oncology medicines are free of charge for nationals in most EMR countries, however access varies based on the level of country development. For example, in Lebanon a significant portion of the Ministry of Health’s budget is allocated on four extremely expensive oncology medicines; however, in Pakistan patients commonly have to pay even for those medicines included in the WHO essential list (19).

Another important element of cancer treatment is access to surgical interventions. While cancer surgery is available in most countries in the Region (77%), the availability of specialist cancer surgery is limited in several countries (Table 3). The structure of surgical services for cancer patients varies from well-established surgical departments with specialized units for the treatment of different cancer sites such as breast, head and neck, digestive tract, to general surgical services

Figure 2 Availability of national guidelines for referral and management of cancer (7)

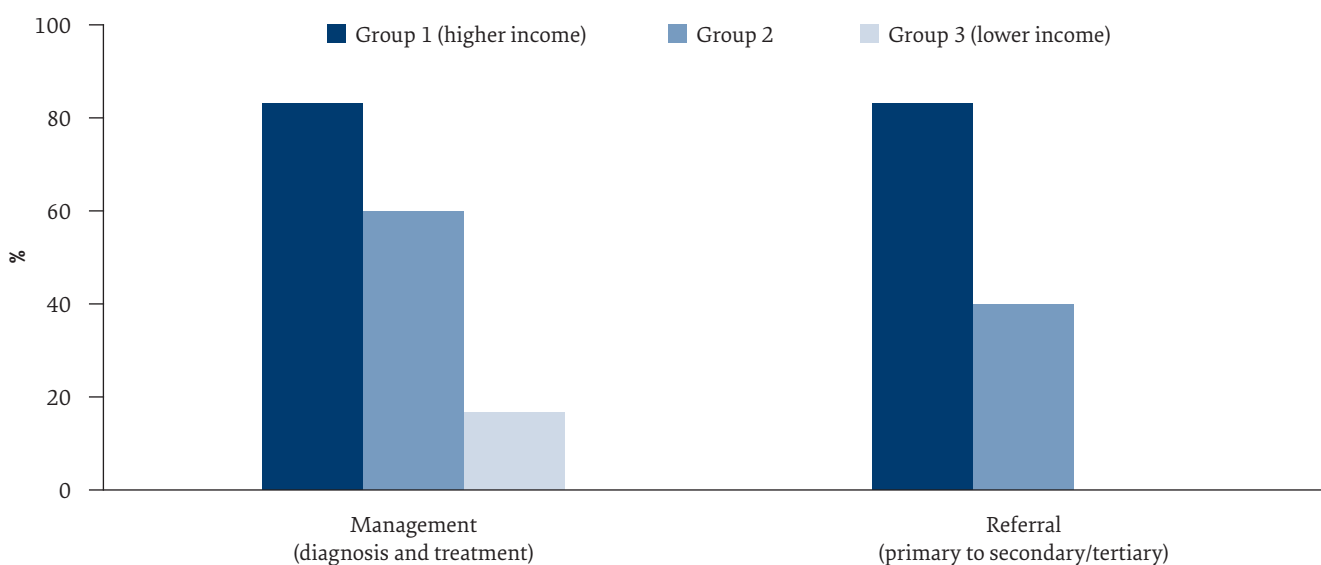


Table 3 Availability of cancer diagnosis and treatment services in the public sector (7)

Availability of cancer diagnosis and treatment services in the public sector (% of countries)				
Country group	Cancer centres or cancer departments at tertiary level	Pathology services (laboratories)	Cancer surgery	Subsidized chemotherapy
Group 1	100%	100%	83%	100%
Group 2	80%	90%	90%	80%
Group 3	50%	50%	50%	50%
Total	77%	82%	77%	77%

Table 4 Availability of EMR palliative care funding and services (7)

Country group	Availability of palliative care in the public health system		Funding for palliative care
	In primary health care	In community or home-based care	
Group 1	17%	33%	100%
Group 2	10%	10%	60%
Group 3	0%	0%	0%
Total	9%	14%	55%

without specialization in cancer where all surgeons can treat cancer patients (19).

Furthermore, modelled figures suggest that there is enough radiotherapy equipment to cover 60% of the Region's radiotherapy needs (20); however, equipment is not evenly distributed. While some countries have more available facilities than is needed, others have very limited facilities. Overall, it is evident that access to cancer treatment is variable both within and between countries. On top of this, the conflicts in the Region have further limited access to cancer treatments for many people. While it is clear that treatment availability must be improved across the Region, the current and future need for palliative care is also evident.

Palliative care

Despite the relatively low EMR cancer survival rates, palliative care needs are unaddressed in many countries, resulting in suffering of many terminally ill cancer patients during the final months of their life. The WHO Model of Palliative Care, developed in 1990, contains four domains: appropriate policies, adequate drug availability, education of health professionals and the public, and implementation of palliative care services (21); only three countries in the Region have palliative care available in the public health system (7). Furthermore, where present, palliative care services are at an early stage of development and not well integrated within the national health care system. Thus, many challenges exist within the areas of governance, human resources, training and medication availability for palliative care (22,23).

The majority of the population in the Region has a limited understanding of palliative care services (22). Furthermore, most healthcare professionals have not undertaken any training on palliative care, since there is not a mandatory module in their education in most EMR countries (22). In addition, there is also a lack of specialist palliative care healthcare professionals and limited volunteers (22).

Notably, pain management availability and access to pain relief medications is restricted in many countries, resulting in low opioid consumption in the Region (24,25). There are several reasons for this, including inadequate or overly strict legislation; unbalanced policies; limitations on available forms of medication especially oral opioids; lack of supply and distribution systems; limitations on who can prescribe; insufficient knowledge on the use of controlled medicines; and inappropriate attitudes towards controlled medicines (22,23).

With limited funding for palliative care across much of the region, and no funding available in the lowest income countries (Table 4), the importance of non-state actors, community organizations, and partnership working should not be understated.

Conclusion

As outlined, momentum and progress on cancer control has been increasing in the Region; however, a number of gaps and challenges remain. The cancer burden is rapidly increasing and this needs to be addressed strategically. Therefore, development of cancer policies, plans and guidelines is fundamental to this. Initiatives for prevention and early detection are needed to reduce the health and social burden on this complex region, and it is important that health professional training is scaled up to address this. Furthermore, treatment for cancer must be considered within health system contexts and economic feasibility, and it is vital that equity of access is addressed.

To improve treatment effectiveness, referral pathways must be developed and cancer-specific guidelines must be available to health professionals. Similarly, palliative care access must be scaled up holistically through awareness raising, health professional training, and improved access to pain relief medication. Although there has been progress in some elements of cancer control, a strategic and systematic approach to cancer has been lacking. However, in May 2017 the World Health Assembly discussed an agenda item titled "Cancer prevention and control in the context of an integrated approach". The Assembly representatives acknowledged the current global situation and urged Member States to take action, including scaling up national cancer control measures as part of national responses to NCDs (26).

In alignment with this increased global impetus, WHO/EMRO has developed a draft Framework for Cancer Control (Figure 3) (27). The document proposes a number of recommended strategic interventions in the six core areas of cancer control: governance; prevention; early detection; treatment; palliative care; and surveillance and research. The document has been developed through extensive consultation with global and regional experts, and was endorsed by the WHO Eastern Mediterranean Regional Committee in October 2017. The framework will support EMR countries to develop a more systematic approach to cancer control.

Figure 3. Framework for action on cancer prevention and control in the WHO Eastern Mediterranean Region (27)

	Strategic interventions	Indicators
In the area of governance	<ul style="list-style-type: none"> Develop a multi-sectoral strategy and action plan for cancer prevention and control, as part of national NCD response Establish a national multi-sectoral committee for cancer prevention and control Ensure sufficient national budget availability for cancer Define an essential cancer care package¹ and identify financing mechanisms to reduce out-of-pocket expenditure Appoint a National Cancer Control Programme manager 	<ul style="list-style-type: none"> An operational, funded national multi-sectoral strategy/ action plan encompassing all areas of cancer prevention and control.
In the area of prevention	<ul style="list-style-type: none"> Healthy lifestyle interventions in the areas of tobacco control, physical activity, healthy diet and alcohol; in-line with the Regional NCD Framework Ensure vaccination against hepatitis B in infancy Ensure Human Papillomavirus (HPV) vaccination in preadolescents in countries with high risk of cervical cancer Eliminate or reduce exposure to occupational and environmental carcinogens, such as asbestos 	<ul style="list-style-type: none"> Five demand-reduction measures of the WHO FTFC² Four measures to reduce unhealthy diet³ At least one national public awareness campaign on diet/ physical activity, within the last 5 years Vaccination coverage against hepatitis B virus monitored by the number of third doses of Hep-B vaccine (HepB3) administered to infants⁴ HPV vaccination coverage
In the area of early detection	<ul style="list-style-type: none"> Develop, implement and update evidence-based, nationally approved guidelines/protocols/standards for the early detection of priority cancers, with a focus on early diagnosis Promote community-awareness about the early symptoms of priority cancers⁵ Promote health professional education on early signs and symptoms of common cancers, for prompt referral of symptomatic patients to diagnostic and treatment services Ensure availability, affordability and accessibility of diagnostic tests for suspected cases Periodically assess effectiveness of early diagnosis and screening programmes 	<ul style="list-style-type: none"> Availability of evidence-based, nationally approved guidelines for early detection of priority cancers⁵ Proportion of cancer patients diagnosed in early stages Reduction in cancer mortality rates for which early detection programmes have been introduced Proportion of cancer patients who receive timely diagnosis within one month of symptomatic presentation at primary health care services Proportion of women between the ages of 30–49 screened for cervical cancer at least once, or more often, and for lower or higher age groups according to national programmes or policies⁴
In the area of management	<ul style="list-style-type: none"> Develop, implement and update evidence-based, nationally approved guidelines/protocols/standards for management of priority cancers Assess the human resource requirements and develop plans to scale up to meet local needs Ensure availability, affordability and accessibility of an essential cancer care package¹ Strengthen coordination of referral system with targets to reduce delays to diagnosis and treatment 	<ul style="list-style-type: none"> Availability of evidence-based guidelines/protocols/standards for management of priority cancers Proportion of patients who complete a course of prescribed treatment Availability of national human resources strategies and plans
In the area of palliative care	<ul style="list-style-type: none"> Ensure inclusion of palliative care within national cancer control plans Develop, implement and update evidence-based, nationally approved guidelines/protocols/standards for palliative care Introduce palliative care into the curricula of healthcare professionals Develop affordable, multidisciplinary integrated palliative care services, including pain relief, psychosocial and spiritual support, in both hospital and community settings Ensure availability and accessibility of opioids, analgesics and other essential palliative care medicines, addressing legal and regulatory barriers 	<ul style="list-style-type: none"> Availability of national guidelines/protocols/standards for palliative care Access to palliative care assessed by morphine-equivalent consumption of strong opioid analgesics (excluding methadone) per death from cancer⁴ Availability of training programmes for healthcare professionals
In the area of surveillance and research	<ul style="list-style-type: none"> Establish and strengthen hospital- and population-based cancer registries that cover a population not less than one million Develop a system to monitor quality of care and the performance of national cancer control programmes Develop and implement a cancer research plan relevant to country needs 	<ul style="list-style-type: none"> Cancer incidence, by type of cancer, per 100 000 population⁴ Availability of progress / gap analysis on implementation of national cancer control plan Number of peer reviewed publications related to cancer

¹ Cancer care package includes diagnostic procedures, medicines and technologies, surgery and radiotherapy, and survivorship care

² Tobacco demand reduction measures, WHO NCD Progress monitor 2017: Increased excise taxes and prices; smoke-free policies; large graphic health warnings/plain packaging; bans on advertising, promotion and sponsorship; mass media campaigns

³ Unhealthy diet reduction measures, WHO NCD Progress monitor 2017: salt/sodium policies; saturated fatty acids and trans-fats policies; marketing to children restrictions; marketing of breast-milk substitutes restrictions

⁴ These are from the WHO 25 indicators of the Global Monitoring Framework on NCDs (<http://www.who.int/nmh/ncd-tools/indicators-definition/en/>)

⁵ Priority cancers for early detection can be selected based how amenable they are to early detection, and on their incidence (and projected future incidence) within the country

Funding: None.

Competing interests: None declared.

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Workshop on WHO Framework Convention on Tobacco Control to promote the Protocol to eliminate illicit trade in tobacco products

Citation: Workshop on WHO Framework Convention on Tobacco Control to promote the Protocol to eliminate illicit trade in tobacco products. East Mediterr Health J. 2018;24(1):111 <https://doi.org/10.26719/2018.24.1.111>

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Illicit trade in tobacco products is a significant concern in the Eastern Mediterranean Region (EMR). Reliable data on its size in each country are not available, and many EMR Member States do not have any reliable estimates on the illegal trade or the proper measures to fight it. To address this, a regional workshop was held in Amman, Jordan, 16–18 May 2017, with the WHO Framework Convention on Tobacco Control (FCTC) secretariat and WHO Regional Office for the Eastern Mediterranean (WHO/EMRO). The workshop pursued the following objectives:

- Strengthen technical and procedural steps at national level to ratify and implement the Protocol.
- Acquire those skills to implement the Protocol in a multi-sectoral approach.
- Improve coordination at national level and with key international players to confront illicit tobacco trade.
- Raise awareness among government officials on the consequences that illicit trade in tobacco products has on public health, finance and security in the Region.
- Address questions from the Member States related to the implementation of the Protocol.

The meeting was attended by 11 Member States (Afghanistan, Egypt, Islamic Republic of Iran, Iraq, Jordan, Lebanon, Libya, Pakistan, Sudan, Syrian Arab Republic and Tunisia) and the regional office of the Framework Convention Alliance. Two members of the Expert Panel on the Protocol gave presentations and shared their experience. While all 11 attendees are Parties to the WHO FCTC, only Iraq and Saudi Arabia have so far adhered to the Protocol.

The Region lacks data on illicit tobacco trade and any data available are provided by the tobacco industry. Thus, a neutral source of data is required. A major obstacle identified is the tobacco industry offering countries its own “solutions” for combatting illicit tobacco trade, arguing that this makes the Protocol unnecessary. Moreover, the tobacco manufacturing companies are sometimes state-owned, which creates conflicts of interests, while political instability and related crises are obstacles to combatting illicit tobacco trade effectively. Importantly, some countries admitted hesitancy in

joining the Protocol since only two Member States so far had done this, and thus do not see becoming a party to the Protocol as a priority. However, ratifying the Protocol does not require any specific level of implementation of the WHO FCTC. Many representatives from the health sector also expressed their concerns regarding mobilizing their peers in ministries for the ratification and implementation of the Protocol, and the lack of a financially viable plan to do so. Here, it was proposed that the FCTC Secretariat and/or WHO/EMRO could communicate the importance to the various stakeholders, while the FCTC Secretariat and WHO/EMRO reminded that the Protocol would come into force only after 40 countries have ratified it, and is subject to a five-year timeline for implementation, allowing time for an affordable implementation strategy. The cost of the tracking and tracing (TT) systems required by the Protocol can be borne by the tobacco industry. Explanations of how tobacco products are smuggled, the interests of the tobacco industry to engage in such activities in parallel to legal sales, and the deterrent power of fines, were also outlined.

Recommendations

The workshop ended with an agreement on a set of recommendations for the Parties, the FCTC Secretariat and the WHO/EMRO Tobacco Free Initiative (TFI), as follows:

- The Parties were encouraged to start the ratification /accession process as soon as possible, using a multi-sectoral approach, and soliciting assistance where needed.
- A specific focus was given on deflecting interference from the tobacco industry – a particular challenge in countries with State-owned tobacco companies.
- The FCTC Secretariat and the WHO/EMRO TFI were encouraged to provide the technical and, where possible, financial assistance to support the Parties.
- The FCTC Secretariat and the WHO/EMRO TFI were encouraged to disclose the tactics of the tobacco industry and to take advantage of high level meetings such as the World Health Assembly (WHA) to promote the entry into force of the Protocol.

Scaling up implementation of the United Nations Declaration on Prevention and Control of Noncommunicable Diseases

(This report is extracted from the Summary report on the Fourth annual regional meeting to scale up implementation of the United Nations Political Declaration on Prevention and Control of Noncommunicable Diseases, Cairo, Egypt, 26–28 April 2016 (http://applications.emro.who.int/docs/IC_Meet_Rep_2016_18735_en.pdf, accessed 13 January 2018).

Citation: WHO Regional Office for the Eastern Mediterranean. Scaling up implementation of the United Nations declaration on prevention and control of noncommunicable diseases. *East Mediterr Health J.* 2018;24(1):112–113. <https://doi.org/10.26719/2018.24.1.112>

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In late 2015, Heads of State and governments had committed themselves to implementing the 2030 Agenda for Sustainable Development, which included five targets related to noncommunicable diseases (NCDs) (1). Until recently, the goal to reduce premature death from noncommunicable disease had been deemed too ambitious. Now, with the endorsement of targets related to NCDs in the Sustainable Development goals (SDGs), the world had acknowledged and realized the significance of meeting the 2015 and 2016 time-bound commitments in order to be able to curb the burden of premature mortality from NCDs.

Following on from these developments, the main highlights of the Fourth Annual Meeting on Noncommunicable Diseases, held from 26 to 28 April 2016, Cairo, Egypt (2) included a detailed assessment of country progress in the implementation of the commitments in the updated Regional Framework for action. In addition, the identification of a way forward to scale up implementation of strategic interventions, as well as renewed support to Member States to monitor and achieve progress in the ten progress indicators in preparation for the third high-level meeting by the United Nations General Assembly in 2018, were addressed.

The meeting was attended by 32 participants from 17 countries of the Region, along with WHO temporary advisers and WHO secretariat. Participants included national managers of NCD programmes and focal points for tobacco control, physical activity, nutrition, surveillance and NCD management. The four priority areas in the regional framework which formed the focus of discussions were governance, prevention, health care and surveillance.

Meeting Recommendations

Member States

1. Scale up implementation of the time-bound commitments and voluntary targets, guided by the regional framework for action, and related guidance and tools developed by WHO.
2. In the area of governance: a) include health-related SDGs and targets in national development policies, plans and strategies; b) set national targets, endorse and implement multisectoral action plans; and c) discuss the current situation across government departments and civil society in order to identify gaps

where technical support would be needed and engage the required stakeholders.

3. In the area of prevention: a) foster implementation of cost-effective interventions for the prevention and reduction of NCD risk factors; b) scale up tobacco control measures (MPOWER) (3) at the highest level and in a sustainable way; c) implement the guidelines of Article 5.3 of the WHO Framework Convention on Tobacco Control (FCTC) (4) alongside the best buys to end tobacco industry influence; d) scale up and take proactive measures in the implementation of the regional action plan on reduction of salt, fat and sugar; and e) enforce implementation of the International Code of Marketing for Breast-Milk Substitutes (5).
4. In the area of health care: a) reorient and strengthen the health system to address NCDs, prioritizing cost-effective interventions, with a focus on strengthening the integration of NCDs in primary health care, both in stable and emergency settings; and b) define a NCD service package to be integrated in primary health care with adequate supplies of NCD essential medicines (as defined in PEN), technologies and trained personnel.
5. In the area of surveillance: a) strengthen NCD surveillance systems, focusing on the three pillars of surveillance (health outcomes, risk factors and national systems response); b) prepare for the third high-level meeting of the United Nations General Assembly in 2018 by availing monitoring systems to report on 10 progress monitoring indicators using the country capacity survey 2017 (6); c) seek to institutionalize the STEPs or an equivalent survey; and d) institutionalize NCD surveillance measures that can be conducted periodically.

WHO

1. Work with Member States in their preparations for the third high-level meeting of the General Assembly in 2018, including in the generation and tracking of data on progress indicators and in the development and implementation of country roadmaps.
2. Provide guidance and develop tools for scaling up the implementation of the strategic interventions in the four priority areas of the regional framework for action.

3. In the area of governance: a) support and facilitate in mainstreaming health related SDGs in national plans and strategies in collaboration with other development partners and stakeholders; and b) provide technical support in setting national targets and implementing multisectoral national action plans, along with advocacy at the highest level of government.
4. In the area of prevention: a) provide technical support in establishing and prioritizing action plans for tobacco control using the MPOWER package and other tools; b) provide technical support and guidelines in the implementation of Article 5.3 for the WHO FCTC (4), as well as the best buys; and c) facilitate holding national workshops to accelerate scaling up of the implementation of the regional action plan on reduction of salt, fat and sugar.
5. In the area of health care, provide technical support and guidance in defining a service delivery model that will assist integration of NCDs in the primary health care system.
6. In the area of surveillance: a) support building the capacity of countries in NCD surveillance frameworks, with particular focus on group 3 countries¹; b) assist countries in setting their national targets; and c) assist countries in conducting the STEPs survey or an equivalent survey.

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¹ Group 3 countries tend to be low income and include Afghanistan, Djibouti, Sudan and Yemen.



Framework for action to implement the United Nations Political Declaration on Noncommunicable Diseases, including indicators to assess country progress by 2018

Updated October 2015, based on resolutions EM/RC59/R.2 & EM/RC60/R.4

Commitments

Strategic interventions

Progress indicators

In the area of governance

Each country is expected to:

- Integrate noncommunicable diseases into national policies and development plans
- Establish a multisectoral strategy/plan and a set of national targets and indicators for 2025 based on national situation and WHO guidance
- Increase budgetary allocations for noncommunicable diseases prevention and control including through innovative financing mechanisms such as taxation of tobacco, alcohol and other unhealthy products
- Periodically assess national capacity for prevention and control of noncommunicable diseases using WHO tools

Country has:

- An operational multisectoral national strategy/action plan that integrates the major NCDs and their shared risk factors
- Set time-bound national targets and indicators based on WHO guidance

Commitments

Strategic interventions

Progress indicators

In the area of prevention and reduction of risk factors

Each country is expected to:

- Accelerate implementation of the WHO Framework Convention on Tobacco Control (WHO FCTC) and ratify Protocol to Eliminate Illicit Trade in Tobacco Products
- Ensure healthy nutrition in early life and childhood including breastfeeding promotion and regulating marketing of foods and non-alcoholic beverages to children
- Reduce average population salt intake in line with WHO recommendations
- Virtually eliminate *transfat* intake and reduce intake of saturated fatty acids
- Promote physical activity through a life-course approach
- Implement the best buys to reduce the harmful use of alcohol

Country is implementing:

- Four demand-reduction measures of the WHO FCTC at the highest level of achievement
- Four measures to reduce unhealthy diet
- At least one recent national public awareness programme on diet and/or physical activity
- As appropriate, according to national circumstances, three measures to reduce the harmful use of alcohol, in line with the WHO global strategy to reduce the harmful use of alcohol

Commitments

Strategic interventions

Progress indicators

In the area of surveillance, monitoring and evaluation

Each country is expected to:

- Implement/strengthen the WHO surveillance framework that monitors mortality and morbidity, risk factors and determinants, and health system capacity and response
- Integrate the three components of the surveillance framework into the national health information system
- Strengthen human resources and institutional capacity for surveillance, monitoring and evaluation

Country has:

- A functioning system for generating reliable cause-specific mortality data on a routine basis
- A STEPS survey or a comprehensive health examination survey every 5 years

Commitments

Strategic interventions

Progress indicators

In the area of health care

Each country is expected to:

- Implement the best buys in health care
- Improve access to early detection and management of major noncommunicable diseases and risk factors by including them in the essential primary health care package
- Improve access to safe, affordable and quality essential medicines and technologies for major noncommunicable diseases
- Improve access to essential palliative care services

Country has:

- Evidence-based national guidelines/protocols/standards for management of major noncommunicable diseases through a primary care approach, recognized/approved by the government or competent authority
- Provision of drug therapy, including glycaemic control, and counselling for eligible persons at high risk to prevent heart attacks and strokes, with an emphasis on the primary care level

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