“What future does the Arab world want? We must recognise and respect the fact that different populations of the Arab world might want different futures; however, the fundamentals of new state–citizen relationships, responsive and accountable institutions, and cooperation for the sake of survival are arguably common to all of these visions.”
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Health in the Arab world: a renewed opportunity

At one peer review meeting held during the preparation of the Lancet Series on Health in the Arab World: a View from Within, Karima Khalil gave me a copy of her beautiful book, Messages from Tahrir: Signs from Egypt’s Revolution (American University in Cairo Press, 2011). She inscribed on the inside “These voices from Tahrir”, and powerful voices they were too. They were voices that seemed to herald an era of extraordinary events across the region. Here are some of the messages she captured in photographs of Egyptians during the first few months of 2011: “We are all Egyptians…wake up”; “America should support the people not the tyrant”; “Enough humiliation”; “Stay steadfast for freedom”; “Do not let your revolution be stolen from you.” 3 years later, the sense of hope that this, and other, Arab uprisings gave birth to has been tempered by an understanding that achieving liberty, equality, and democracy will take considerably longer than perhaps was initially thought.

The most appalling example of public protest evolving into bitter civil conflict is Syria. The consequences for the region continue to be deeply disturbing. First, the human cost—hundreds of thousands of families displaced and living as refugees in Jordan, Lebanon, Turkey, and Iraq. With over 2 million refugees and over 4 million internally displaced Syrians, the UN last month launched the largest humanitarian appeal in its history. Second, the geopolitical threat—as tensions between nations rise as a result of the Syrian conflict, and as conflicts between different groups within the Arab world escalate, the potential for further confrontations elsewhere remains high. And third, the economic burden—political instability will create adverse economic conditions for sustainable growth in the region, with important impacts on prospects for poverty reduction and increased investments into the health sector. In Syria, the health system is already effectively destroyed. The risk of damage to neighbouring health systems is real.

These political events make it all the more important to examine the conditions for advancing health and wellbeing in the region. This Series describes the state of health of Arab and non-Arab peoples living in the Arab world by estimating the burden of diseases, injuries, and risk factors they face. But then the Series departs from the usual format of our country studies. When the authors met to plan their work, they did not want to use the conventional approach of a health systems analysis, a report of the challenges either from infectious diseases or to maternal and child health, and a call to action. Instead, they wished to describe the region by emphasising, in particular, the major political determinants of health. A previous comprehensive analysis of health in the Arab world had already been published, so there was considerable scope to, and advantage from, this different approach.

With that objective in mind the Series begins with governance. It is followed by studies of non-communicable diseases, universal health coverage, the changing geographies of war, and finally the issue of survival—ecological sustainability in the Arab world. These papers are complemented by a Viewpoint on recent political changes across the Arab world and their meaning for health, two essays on research networks and state formation, and four Comments looking at issues ranging from health equity to tobacco control.

Visiting the Arab world today introduces you to unparalleled diversity. The steel and glass efficiency of monumental architectural constructions in Qatar, the quieter but no less intensely successful tourist industry in Oman, the inspiring resilience of the occupied Palestinian territory, the culturally vibrant international urban hubs of Cairo and Beirut, and the endemic and seemingly ineradicable violence of Iraq. This diversity is symbolic of a region in transition—ageing populations, deepening within and between country inequalities, increasing participation of the private sector in health-care delivery, residually weak public sectors, and the resurgence of infectious threats.

In my notes taken over the past 2 years preparing for this Series, I wrote three personal hopes: first, to overcome the invisibility and even erasure of the Arab world in global health (and medical journals); second, to identify and emphasise Arab leadership in the Arab region; and third, to elevate the Arab voice in (global) health. One Series alone cannot deliver all of these goals. But I hope it can make a small and irreversible contribution to their ultimate achievement.

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The Arab world today faces major challenges to health development, which are captured by papers in this Series. After my election as WHO Regional Director for the Eastern Mediterranean in January, 2012, my first task was to work closely with WHO member states to agree on an agenda to address these challenges. A series of high-level consultations was held with countries and experts, after a process of objective analysis of the health situation in the countries of the region. It is a region of great diversity. Although many countries, both Arab and non-Arab, have made great gains and have built extensive modern networks of health infrastructure with wide deployment of medical technologies, these gains have not been shared across and within countries. Many of the challenges cut across the health sector and are shared by all countries.

In October, 2012, health ministers of the region agreed on five key priority areas—highly relevant to all countries—and on strategic directions for public health action to tackle them.1 2 The priority areas were aligned with the five categories for priority setting that were endorsed by all WHO Member States during the World Health Assembly in May, 2012. Although these directions were intended to guide the work of WHO, their focus and nature make them applicable for a much broader range of stakeholders and partners.

One of the five priorities is strengthening of health systems. Accelerating progress towards universal health coverage by reforming health systems is top priority for WHO in the region. The aim is to ensure access for all people to quality health services without risk of financial hardship. This is a difficult challenge considering the current low levels of prepayment schemes and high out-of-pocket health expenditures in many countries. With support from WHO, and working closely with the World Bank and other partners, countries are beginning to develop a vision,
Children,5 has been launched, and national acceleration Dubai Declaration for Saving the Lives of Mothers and Development Goals 4 and 5. A regional response, the region as a whole will not be able to achieve Millennium surveillance and response by June, 2014, at the latest.4 Health Assembly for achieving the core capacities for to do more to meet the requirements set by the World Health Regulations provide a framework for countries continue to emerge. Although the 2005 International Health problems vary. Viral hepatitis and malaria are major health problems in some countries. The region has the fastest rate of increase among WHO regions in the number of HIV infections and the lowest coverage with antiretroviral therapy. It also has two of the world’s three remaining pockets of polio. Recent outbreaks in countries that had been free of polio for many years represent a major impediment to global eradication efforts, and led ministers of health to declare polio a regional emergency and mount a comprehensive response.3 New infections, such as the Middle East respiratory syndrome, also continue to emerge. Although the 2005 International Health Regulations provide a framework for countries to respond to acute public health threats, countries need to do more to meet the requirements set by the World Health Assembly for achieving the core capacities for surveillance and response by June, 2014, at the latest.4

A third priority is maternal and child health; 889,000 children younger than 5 years and 39,000 mothers needlessly die each year in the region from avoidable causes. At the present rate of action, the region as a whole will not be able to achieve Millennium Development Goals 4 and 5. A regional response, the Dubai Declaration for Saving the Lives of Mothers and Children,3 has been launched, and national acceleration plans are being implemented in high-burden countries, which include seven Arab countries.

Non-communicable diseases are also a crucial challenge, particularly cardiovascular diseases, cancers, and diabetes—the burden of each continues to escalate. In some countries, up to 40% of those dying from non-communicable diseases are aged younger than 60 years. The response of countries to the very clear road map for addressing non-communicable diseases outlined in the global strategy3 and the Political Declaration of the United Nations General Assembly3 of September, 2011, is, so far, inadequate. However, countries have adopted a regional framework for action specifying commitments to implement strategic interventions in governance, prevention of risk factors, surveillance, and health care.6 Some progress is being made but gaps in action remain.

The fifth priority is emergency preparedness and response. Protracted emergencies seem almost to have become a way of life in some parts of the region, and more than half of the countries are currently facing either acute or chronic crises. The major source of emergencies is civil unrest and violent conflict. The consequences are clear in the expanding humanitarian crisis in Syria and its neighbours, with rising numbers of people displaced. Health systems in all countries affected are facing major difficulties in coping with the demands. Collective action and solidarity are needed to deliver health services to refugees and host communities, and to increase the resilience of countries to emergencies and ensure effective public health responses during crises.

Much work is still ahead of us in each of these five areas. Health goals in the Arab world will only be realised through the building of strong health systems, solid commitment to health promotion, and ensuring that health is considered in all government policies. Solidarity among countries is of crucial importance. The contribution of high-income countries in the region to achieve better health in low-income countries needs to be scaled up.

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I declare that I have no conflicts of interest.

The calls for freedom, social justice, and human dignity that resonate within the Arab world have been heard loud and clear but, as yet, are not reflected in a new development paradigm. The legitimate aspirations of the Arab population are suffocated by deeply polarised societies and a very narrow interpretation of social justice. These two deterrents are a manifestation of failure of the development trajectory to embrace fairness and inclusiveness as core prerequisites for individual and social wellbeing.

Development has emphasised economic growth and access to services, and employed a narrow translation of social justice in terms of provision of minimum basic needs to the poorest populations. As a result, many Arab countries (eg, those of the Persian Gulf, Libya, Lebanon, Algeria, and Tunisia) have been placed in very high or high ranks in terms of the Human Development Index. Other Arab countries, including those in the low Human Development Index rank, have managed to achieve great improvements on economic and health fronts. Notably, before the uprisings in Tunisia and Egypt, these countries were complimenting themselves on such economic and health improvements and on commitments to poverty reduction.

So where did the Arab world go wrong? The people of the region provided the answer to this question. Protesters on the streets of Cairo, Egypt, and in Tunisia were asking for fair employment, and recognising that jobs and rewards are offered on the basis of family connections and political affiliations. Young women were making their voices heard by objecting to the continuous assault on their public spaces. Low-income and underserved communities were asking for their just entitlements. They all demanded freedom of expression, political voice, and protection from police brutality. They recognised social justice as fairness in the creation of participatory opportunities, and in empowerment not restricted to remedial welfare handouts.

Clearly, past failures underlie frustrations with the status quo, and have eroded social fabrics and bred extremism and polarisation in society. Overall economic growth, which is equitably distributed, and accessibility to public services are necessary but not sufficient to bring about social changes that can lead to refutation of ideas such as superiority of one religious group over another, or tolerance to discrimination by sex. Arab countries must ensure the foundations of citizenship and non-discrimination by sex, religion, and ethnic or social background.

I propose that targeting health equity as a central development goal and as a measure of societal success can go a long way in avoiding the failures of the past. Health equity needs to capture people's aspirations for wellbeing, and must be grounded in a transformative understanding of social justice on the basis of fairness and inclusiveness for all.

This proposal is in full accordance with the global development discourse. It draws on a rich evidence base linking systematic inequalities in health to their structural causes. Such a foundation is, at present, evolving into a growing movement pushing health equity to the forefront. This movement is explicit in crystallising the key differences between a social determinants approach to health and a social justice approach to health equity. The social justice approach is not about the size of resources, but their fair allocation and distribution, and contributes an additional value judgment to health equity. It considers health inequality as unfair, not only because it involves denial of a human right, but also because it expresses the inequitable distribution of power, money, and resources. The discourse has now moved from effective government into good governance.

Another distinctive feature of the present health equity movement is its concern with wellbeing and not only physical ill health. This provides an explanation as to why such a movement invites empowering
and low with the lowest exceeded 1·5 for most middle mortality in the highest wealth quintile as compared to Algeria, Egypt, Morocco, Oman, and Tunisia. In the example, during 2001–08, the relative risk for under-5 mortality in the highest wealth quintile reached 3·10 for self-declared depression.

The Arab world is yet to embrace and to join this movement. The appreciation of links between voiced aspirations and realisation of an equitable distribution of health has not filtered into the conscious minds of Arab people, and has not gained the prominence it deserves within the policy arena. This is mainly a conceptual failure but is very much supported by the well known measurement trap, where neglect and absence of data are self-reinforcing.

The available information base about health in Arab countries does not allow a full picture of the status and trend of health inequities. The little we know, however, does show wide health inequities that prevail within all Arab countries regardless of their economic status. For example, during 2001–08, the relative risk for under-5 mortality in the highest wealth quintile as compared to the lowest exceeded 1·5 for most middle-income and low-income Arab countries, and exceeded 2 for Algeria, Egypt, Morocco, Oman, and Tunisia. In the Arab countries of the Persian Gulf, public accessibility of health data by social stratifiers is a major constraint. The limited available data for Oman and the United Arab Emirates allow us to calculate few measures. Data for Oman show a relative risk of self-declared depression reaching 1·97 in the highest compared with the lowest category of education, and as high as 3·89 between governorates. Similarly, in the United Arab Emirates, the relative risk between the highest and lowest wealth quintiles reaches 3·10 for self-reported depression.

Notably, a change in the dominant development paradigm and building of a culture of equitable decision making based on evidence are fundamental prerequisites in the Arab world. The movement from political will and policies to successful implementation, however, is not straightforward. This requires capacity (be it institutional, financial, technical, or human) and important contributions from civil society, the research community, and international partners. Of particular importance, for the Arab world, is global influence. The absence of fairness in international relations can greatly undermine national efforts. However, the coherence of international champions and development cooperations can very much drive the agenda forward. The post-2015 Millennium Development Goal agenda is one of the opportunities for showing such coherence.

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Smoking rates in the Arab world are some of the highest worldwide. The epidemic is characterised by high and increasing rates of smoking in men and a dramatic re-emergence of waterpipe smoking, especially in young people (aged 13–24 years) and women. Although 19 of the 22 Arab countries have ratified the Framework Convention for Tobacco Control, implementation and enforcement of its provisions has been slow, weak, and ineffective in most countries.

Advocacy for a tobacco control agenda that protects and promotes public health has been successful in other regions of the world. Active engagement and collaboration between various sectors committed to tobacco control has resulted in some success stories in the Arab world as well. Reports have outlined crucial elements for successful tobacco control advocacy and policy change, but in this piece we emphasise those most relevant to the Arab world on the basis of our own experience.

First is the need for local evidence to support advocacy and policy. This element is particularly important to provide context-specific counter-arguments to those brought about by opposing forces to local policy change, such as advertising agencies or multinational tobacco companies.

Second is the importance of partnerships between academics and motivated and passionate activists, who believe in tobacco control and have strong resolve to achieve change. Partners complement each other in the skills they bring to the partnership, and widen the circle of support. In Lebanon, for example, such collaborations were instrumental in the advancement of the clean indoor air policy, and involved academics working with communication experts with strong contacts with local media, and experts in bold, confrontational advocacy techniques such as stunt flash mobs and direct action. A key element in the success of these partnerships, in our experience, was the promotion of one voice and one message. Opposing forces, naturally, were keen to promote the need for smoking areas rather than smoke-free public spaces, and the need for gradual implementation and enforcement. Promoting one voice—backed by evidence from around the world—ensured success in counteracting these suggestions.

The third element is the importance of perseverance and audacity in the face of overwhelming opposition. This approach usually requires relentless day-in, day-out focus on the target to be achieved by the tobacco control community, and the ability not to get entangled with the sideshows put on by the opposition to derail the discourse towards their own agenda (e.g., freedom of choice, consumer rights, and loss of revenues). It also means the ability to engage in various channels and media to maintain public pressure and support for tobacco control policies.

Fourth is the importance of having a very good understanding of power relations and structure relevant to each country or context and each tobacco control policy. In particular, tobacco control partners need to be savvy about power relations and dynamics locally, as well as their external connections with the international tobacco industry. Exposing such connections, at the right time, can provide the key catalyst for policy change.

Fifth is the value of developing personal relationships with stakeholders along the way, who understand the main rationale for tobacco control and are ready to go out of their way to support tobacco control work. For example, maintaining a strong relationship with the media can be crucial in advocacy for tobacco control policies. Additionally, personal relationships with supportive politicians can guide tobacco control advocacy by providing access to confidential business or political deliberations.

The final element is to be willing to let others take credit. This action requires an understanding that each success provides a springboard to the next, and that long-enduring partnerships require giving credit to other partners—especially those that are not public health professionals—to keep them motivated and engaged. In the end, the most important success is the passage and implementation of a strong tobacco control law.

The uniqueness of each society and each tobacco control policy needs a critical analysis of what works by those familiar with the intricacies of the local context. This approach is of paramount importance for the effective adaptation of global strategies to local settings. In the Arab world, where public health policies suffer from chronic weakness, partnerships need to be created to provide the needed public pressure for such policies. Such partnerships can be built around academic and advocacy cooperation and involve local, regional,
and international professional networks. This approach bodes well for a strong unified voice and action for tobacco control and public health in the Arab world.

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We declare that we have no conflicts of interest.

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During a visit to Lebanon in July, 2011, Lancet Editor-in-Chief Richard Horton invited us to prepare the *Lancet* Series on health in the Arab World: a View from Within. The invitation fell on receptive ears, and came at the right time. Earlier that year, four of us had finished collaborating on an edited volume entitled *Public Health in the Arab World,* with more than 80 contributing scholars, mostly from the region, and some international scholars.

Conducting research to provide evidence that can contribute to improving health in a region engulfed in war and ongoing turmoil is not an easy matter. Researchers in our region must struggle with and overcome several constraints, including heavy teaching loads and institution-building priorities, leaving little time dedicated to research; absence of institutional incentives and support for conducting quality research; dearth of publicly available datasets; and absence of funding and government commitment to encourage research. But above all, we must sometimes confront enormous challenges brought about by wars and conflicts, injustice, fragmentation, insecurities, and uncertainties, which can at times suddenly dwarf our research agendas and make them irrelevant.

In response to this predicament and to remain engaged, productive, and relevant we learned the importance of working in teams and building networks to support each other. And so, over the past decade, a group of us came together on the basis of a common understanding of the importance of the social and political contexts of health; an interest in developing frameworks of analysis that are relevant to the realities and reflective of the needs of our region; and with the aim of giving voice to a regional perspective on issues of health and wellbeing, now hardly existing in the international literature.

The onset of uprisings in several countries in the region during the period of preparing the Series created an immediate need for fresh perspectives and new scholarship. Initially we wanted to give the Arab uprisings a special place in the Series. Eventually, we decided against a theme on “health and the Arab spring”, attractive as this had seemed at the time, in recognition of the larger picture of health, politics, and society in the region. In retrospect, this approach served us well.

With space available for only a few contributions, the selection of priority topics for Series papers, Viewpoints, and Comments was the first challenge facing members of the Coordinating Committee (H Zurayk, R Giacaman, and S Jabbour) and the Steering Group (all authors listed on this Comment). We wanted to address issues of high relevance, while focusing on dimensions of particular
The impact of the political context and conflicts and wars on health and well-being in the Arab world has been significant. Some issues such as women’s health had been covered well in the *Public Health in the Arab World* volume. Additionally, we were interested in presenting a multidisciplinary approach in all papers.

The Series paper themes were thus extensively discussed by the Coordinating Committee and the Steering Group. In the process, we also had to consider the essential issue of identifying possible lead authors and coauthors. We wanted a quality scientific product, and searched for quality contributors. In selecting authors, we also sought diverse professional and country backgrounds and focused on multidisciplinarity. Our local, regional, and international networks were very useful in bringing together scholars from the Arab world in the main, sometimes in collaboration with international scholars with previous experience in undertaking research in the region. A list of themes for papers and lead authors was eventually drawn up, agreed on, and solicited with selective changes made early in the process. We were amazed at the enthusiastic response of authors joining the Series.

The Steering Group and lead authors developed an active network of discussions and consultations, meeting face-to-face three times between March, 2012, and March, 2013. These meetings were indispensable for the crystallisation of the Series, and brought ideas and people closer together. In fact, it would have been difficult to envisage the Series without these meetings.

From July, 2011, to October, 2013, when authors were actively working on the Series, the region continued to go through the so-called springs and falls of political change that we are still witnessing to this day. Some periods were very intense, boding great dangers, a reality which has become part of our daily lives in the region. Yet we somehow coped and continue to cope to ensure uninterrupted productivity. This gives the Series a distinctive meaning for all who contributed to its production with resolve and resilience. It became a project to complete as a must, showing our commitment to health and wellbeing based on dignity and justice in the Arab world.
The state of health in the Arab world, 1990–2010: an analysis of the burden of diseases, injuries, and risk factors


Summary

Background The Arab world has a set of historical, geopolitical, social, cultural, and economic characteristics and has been involved in several wars that have affected the burden of disease. Moreover, financial and human resources vary widely across the region. We aimed to examine the burden of diseases and injuries in the Arab world for 1990, 2005, and 2010 using data from the Global Burden of Diseases, Injuries, and Risk Factors Study 2010 (GBD 2010).

Methods We divided the 22 countries of the Arab League into three categories according to their gross national income: low-income countries (LICs; Comoros, Djibouti, Mauritania, Yemen, and Somalia), middle-income countries (MICs; Algeria, Egypt, Iraq, Jordan, Lebanon, Libya, Morocco, occupied Palestinian territory, Sudan, Syria, and Tunisia), and high-income countries (HICs; Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates). For the whole Arab world, each income group, and each individual country, we estimated causes of death, disability-adjusted life years (DALYs), DALY-attributable risk factors, years of life lived with disability (YLDs), years of life lost due to premature mortality (YLLs), and life expectancy by age and sex for 1990, 2005, and 2010.

Findings Ischaemic heart disease was the top cause of death in the Arab world in 2010 (contributing to 14·3% of deaths), replacing lower respiratory infections, which were the leading cause of death in 1990 (11·0%). Lower respiratory infections contributed to the highest proportion of DALYs overall (6·0%), and in female individuals (6·1%), but ischaemic heart disease was the leading cause of DALYs in male individuals (6·0%). DALYs from non-communicable diseases—especially ischaemic heart disease, mental disorders such as depression and anxiety, musculoskeletal disorders including low back pain and neck pain, diabetes, and cirrhosis—increased since 1990. Major depressive disorder was ranked first as a cause of YLLs in 90, 2005, and 2010, and lower respiratory infections remained the leading cause of YLLs in 2010 (9·2%). The burden from HIV/AIDS also increased substantially, specifically in LICs and MICs, and road injuries continued to rank highly as a cause of death and DALYs, especially in HICs. Deaths due to suboptimal breastfeeding declined from sixth place in 1990 to tenth place in 2010, and childhood underweight declined from fifth to 11th place.

Interpretation Since 1990, premature death and disability caused by communicable, newborn, nutritional, and maternal disorders (with the exception of HIV/AIDS) has decreased in the Arab world—although these disorders do still persist in LICs—whereas the burden of non-communicable diseases and injuries has increased. The changes in the burden of disease will challenge already stretched human and financial resources because many Arab countries are now dealing with both non-communicable and infectious diseases. A road map for health in the Arab world is urgently needed.

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countries bordering the Persian Gulf—eg, Saudi Arabia and the United Arab Emirates—have a rising burden of occupational and road injuries because of the high number of expatriates who migrate for job opportunities.** Non-communicable diseases have increased substantially in the Arab world, with varying prevalence between different populations.** Therefore, conclusions about the Arab world cannot be drawn from simple generalisations because they are likely to be misleading.a The status of the health-care system in the Arab world has been reported previously.3 Public health systems are perceived as being non-productive and are low priority in national spending plans.3 Despite the resources in some...
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Arab countries, the development and performance of their public health systems are lower than expected, with a continued focus on treatment rather than prevention. Progress in health care in the Arab world has been reported; however, it has been slow in some countries compared with others.

In this study, we assess the burden of disease and injuries in the 22 Arab countries in 1990, 2005, and 2010 using data and methods from the Global Burden of Diseases, Injuries, and Risk Factors Study 2010 (GBD 2010).11–18

Methods
Overview
GBD 2010 was a comprehensive assessment of the burden of 291 diseases and injuries, 1060 disease sequelae, and 67 risk factors. Estimates of these were provided by age group, sex, and country for 1990, 2005, and 2010.19–28 Health loss was assessed with a systemic analysis of all the available data, with the following metrics: mortality, causes of death, years of life lost due to premature mortality (YLLs), years of life lived with disability (YLDs), and disability-adjusted life years (DALYs).

DALYs are a summary measure of premature mortality and time spent in health states that are less than ideal health.29 YLLs, YLDs, and DALYs indicate health loss in time.29 DALYs are computed by the summation of YLLs and YLDs.29 YLLs are calculated by multiplication of the number of deaths attributed to a disease by the standard life expectancy at the age of death in years,29 whereas YLDs are calculated by multiplication of the prevalence of different disease or injury sequela by the associated disability weight for that sequela and the duration until the person with a disease dies or has disease remission.30

Mortality
A detailed description of how age-specific mortality has been estimated for each sex, country, and year has been published.31 Data for mortality were from different sources depending on the availability of data. For countries with great resources, information about deaths are from official vital registration systems.32 However, in low-income and middle-income countries, several sources of data might have been used to calculate all-cause mortality estimates that are as complete as possible.33–35

Causes of death
Numbers of deaths and YLLs were computed on the basis of underlying cause of death estimates for the 235 of 291 diseases and injuries that caused mortality on the GBD 2010 cause list. Cause of death estimates were calculated using a database that included data from vital registration, verbal autopsy, mortality surveillance, and other sources covering 187 countries from 1990 to 2010. Different revisions and national variants of the International Classification of Diseases and Injuries were mapped to the GBD 2010 cause list. Deaths assigned to ill-defined diagnoses or to disorders that were not likely to be the underlying cause of death were reassigned using standard algorithms.36,37 Standard simulation methods were used to generate 95% uncertainty intervals for cause of death estimates by taking 1000 draws for each age group, sex, country, year, and cause.38 These 95% uncertainty intervals reflect uncertainty in the levels of all-cause mortality for each age group, sex, country, and year and the uncertainty in the estimation of each cause of death for each age group, sex, country, and year.

YLDs and healthy life expectancy (HALE)
YLDs have been estimated for 1160 disease and injury sequelae in the hierarchical cause list in GBD 2010. Most estimates were developed using a Bayesian meta-regression method, DisMod-MR. DisMod-MR makes use of the data for incidence, prevalence, remission, excess mortality, and cause-specific mortality to produce prevalence estimates. Prevalence of each sequela was multiplied by the disability weight for that sequela. Disability weights were elicited with data from general population surveys in five countries—USA, Peru, Tanzania, Bangladesh, and Indonesia—to capture a diverse set of views, and an internet survey.39 Disability weights were elicited with pairwise comparisons in which the respondent was asked to identify which health state represents a higher level of health.40 Uncertainty in the disability weight for each sequela has been propagated into the estimates of YLDs for each disease and injury. Overall, HALE was calculated from both the age-specific mortality rates and the age-specific YLDs using a standard approach to extend the life table to capture adjustments for non-fatal health outcomes.37

Risk factors
67 risk factors or clusters of risk factors for mortality, YLLs, YLDs, and DALYs were assessed in GBD 2010. Attributable deaths or DALYs associated with each risk factor were assessed using four components: a database on risk factor exposure from the published scientific literature; estimation of the prevalence of risk factor exposure by country, age, and sex on the basis of both published and unpublished sources using mostly Bayesian methods; estimation of the relative risks for risk–disease pairs according to published and unpublished data; and comparison of the current distribution of exposure to a counterfactual distribution called the theoretical minimum risk distribution for each risk factor. The analysis of each risk factor or risk-factor cluster was done separately such that the sum of attributable fractions for a disease or injury might be greater than 100%. Uncertainty in the relative risks, exposure estimates, theoretical minimum risk distributions, and in the background outcome rates have been taken into consideration in the final estimates.

Arab world analysis
To track the health performance of the Arab countries, we divided them according to their gross national
income (GNI) per person: low-income (LICs), middle-income (MICs), and high-income countries (HICs). LICs had a mean GNI per person of US$523. MICs had a GNI per person of $3251, and were further subdivided into lower-class and upper-class countries. The oil-rich HICs had a GNI per person of $39 688. We classified Comoros, Djibouti, Mauritania, Yemen, and Somalia as LICs; Algeria, Egypt, Iraq, Jordan, Lebanon, Libya, Morocco, occupied Palestinian territory, Sudan, Syria, and Tunisia as MICs; and Bahrain, Saudi Arabia, Kuwait, Oman, Qatar, and the United Arab Emirates as HICs.

The Arab countries are diverse and, arguably, Comoros or Somalia could be included in other regions of the world. However, all the countries we have analysed in this study belong to the League of Arab States. Furthermore, any grouping has the potential to misclassify a country; however, we feel that a grouping based on income is the most reasonable.

The choices of diseases and risk factors were similar to those assessed in previous GBD 2010 studies. Briefly, we focused mainly on diseases that cause death and on risk factors with available data and of importance to disease burden and policy. The data sources for our analyses are similar to those used for GBD 2010.

In this report, we estimated the burden of disease for all Arab countries and for the three income groups separately. We did additional analyses to decompose changes in the burden of disease in the Arab world from 1990 to 2010 into age-specific and sex-specific rates, demographic changes in population age and sex structure, and population growth.

The rankings of the burden of disease are based on absolute estimates or mean estimates. We used complex mathematical computations to estimate the mean ranks. Briefly, we computed the mean ranks, and we drew each rank individually and then calculated the mean upper and lower ranks. As a result, the absolute and mean ranks might differ.

Because of the large amount of data, we present some of the main findings in this report and further results in the appendix. Country-specific burden data are reported on The Institute for Health Metrics and Evaluation (Seattle, WA, USA) website.

### Figure 1: Ranks for top 25 causes of death in the Arab World, 1990 to 2010

Data are based on mean ranks. COPD=chronic obstructive pulmonary disease.
Role of the funding source
The sponsor of the study had no role in study design, data gathering, data analysis, data interpretation, or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility to submit the report for publication.

Results
In 2010, ischaemic heart disease was the leading cause of death in the Arab world (contributing to 14.3% of deaths; appendix p 1), whereas in 1990 it was ranked second (figure 1). From 1990 to 2010, the ranking of deaths; appendix p 1), whereas in 1990 it was ranked first, second, third, fourth, and eighth, respectively, in 2010 (appendix p 29). Physical inactivity and intimate

<table>
<thead>
<tr>
<th>1990</th>
<th>2005</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male individuals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Lower respiratory infections 10.9% (9.1–12.6)</td>
<td>Lower respiratory infections 6.8% (5.3–8.0)</td>
</tr>
<tr>
<td>2</td>
<td>Diarrhoea 9.9% (8.5–11.9)</td>
<td>Ischaemic heart disease 5.4% (4.9–6.0)</td>
</tr>
<tr>
<td>3</td>
<td>Preterm birth complications 5.5% (4.3–7.1)</td>
<td>Preterm birth complications 4.6% (3.6–5.6)</td>
</tr>
<tr>
<td>4</td>
<td>Congenital anomalies 4.8% (3.0–6.6)</td>
<td>Preterm birth complications 4.6% (3.6–5.6)</td>
</tr>
<tr>
<td>5</td>
<td>Ischaemic heart disease 4.0% (3.6–4.6)</td>
<td>Road injury 4.1% (3.5–5.1)</td>
</tr>
<tr>
<td>6</td>
<td>Road injury 3.2% (2.6–4.4)</td>
<td>Congenital anomalies 3.6% (2.6–4.3)</td>
</tr>
<tr>
<td>7</td>
<td>Stroke 3.0% (2.6–3.6)</td>
<td>Stroke 3.6% (3.0–4.0)</td>
</tr>
<tr>
<td>8</td>
<td>Protein-energy malnutrition 3.0% (2.1–4.1)</td>
<td>Low back pain 3.3% (2.2–4.7)</td>
</tr>
<tr>
<td>9</td>
<td>Neonatal encephalopathy 2.4% (1.7–3.2)</td>
<td>Malaria 3.2% (1.6–5.7)</td>
</tr>
<tr>
<td>10</td>
<td>Low back pain 2.2% (1.5–3.2)</td>
<td>Major depressive disorder 2.6% (1.9–3.5)</td>
</tr>
<tr>
<td><strong>Female individuals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Diarrhoea 10.7% (9.4–12.0)</td>
<td>Lower respiratory infections 6.9% (5.7–7.8)</td>
</tr>
<tr>
<td>2</td>
<td>Lower respiratory infections 10.5% (9.2–12.0)</td>
<td>Diarrhoea 5.1% (4.3–6.0)</td>
</tr>
<tr>
<td>3</td>
<td>Preterm birth complications 4.8% (3.5–6.2)</td>
<td>Major depressive disorder 4.7% (3.3–6.1)</td>
</tr>
<tr>
<td>4</td>
<td>Congenital anomalies 4.7% (2.9–6.5)</td>
<td>Preterm birth complications 4.4% (3.3–5.5)</td>
</tr>
<tr>
<td>5</td>
<td>Major depressive disorder 3.4% (2.4–4.6)</td>
<td>Ischaemic heart disease 4.2% (3.8–4.7)</td>
</tr>
<tr>
<td>6</td>
<td>Ischaemic heart disease 3.2% (2.9–3.6)</td>
<td>Stroke 3.6% (2.9–4.0)</td>
</tr>
<tr>
<td>7</td>
<td>Stroke 3.0% (2.6–3.6)</td>
<td>Malaria 3.6% (1.7–6.3)</td>
</tr>
<tr>
<td>8</td>
<td>Protein-energy malnutrition 3.0% (2.1–4.2)</td>
<td>Congenital anomalies 3.5% (2.6–4.0)</td>
</tr>
<tr>
<td>9</td>
<td>Iron-deficiency anaemia 2.5% (1.8–3.6)</td>
<td>Low back pain 3.1% (2.0–4.4)</td>
</tr>
<tr>
<td>10</td>
<td>Maternal disorders 2.3% (1.7–2.8)</td>
<td>Iron-deficiency anaemia 3.1% (2.1–4.2)</td>
</tr>
</tbody>
</table>

| Total | | | |
| 1 | Lower respiratory infections 10.7% (9.5–11.9) | Lower respiratory infections 6.8% (5.7–7.7) | Lower respiratory infections 6.0% (4.9–6.9) |
| 2 | Diarrhoea 10.3% (9.2–11.5) | Diarrhoea 5.0% (4.4–5.9) | Ischaemic heart disease 5.3% (4.9–5.8) |
| 3 | Preterm birth complications 5.2% (4.4–6.2) | Ischaemic heart disease 4.9% (4.5–5.3) | Preterm birth complications 4.2% (3.3–5.1) |
| 4 | Congenital anomalies 4.8% (3.5–6.0) | Preterm birth complications 4.5% (3.8–5.3) | Diarrhoea 4.1% (3.5–4.9) |
| 5 | Ischaemic heart disease 3.7% (3.4–4.0) | Stroke 3.6% (3.1–3.9) | Major depressive disorder 4.0% (2.9–5.2) |
| 6 | Stroke 3.0% (2.7–3.4) | Major depressive disorder 3.6% (2.5–4.6) | Stroke 3.8% (2.3–4.2) |
| 7 | Protein-energy malnutrition 3.0% (2.3–3.9) | Congenital anomalies 3.5% (2.8–4.1) | Low back pain 3.6% (2.5–4.9) |
| 8 | Major depressive disorder 2.6% (1.9–3.3) | Malaria 3.4% (2.0–5.2) | Congenital anomalies 3.3% (2.6–3.8) |
| 9 | Road injury 2.4% (2.0–2.8) | Low back pain 3.2% (2.2–4.4) | Road injury 3.3% (2.8–3.9) |
| 10 | Iron-deficiency anaemia 2.2% (1.5–3.1) | Road injury 3.0% (2.6–3.5) | Iron-deficiency anaemia 2.7% (1.9–3.7) |

Data are the percentage contribution of the disease to all disability-adjusted life-years (DALYs) in that year (95% uncertainty interval). Total number of DALYs was 105,455,000 in 1990, 107,664,000 in 2005, and 112,053,000 in 2010. Rankings are based on absolute estimates.

Table 1: Top ten causes of disability-adjusted life-years in the Arab world by sex and overall in 1990, 2005, and 2010.
partner violence were new contributors to DALY-attributable risk factors in 2010, ranking ninth and 16th, respectively (appendix p 30). Because intimate partner violence for 1990 was not reported in the GBD 2010 study, we cannot assess trends.

Major depressive disorder ranked the highest as the cause of YLDs in 1990, 2005, and 2010 (appendix p 2), and was higher among women than men. In 2010, low back pain (10·1%) and iron-deficiency anaemia (7·4%) were ranked the second and third causes for YLDs, respectively. Lower respiratory infections remained the leading cause of YLLs in 2010 (9·2%; appendix p 3). Ischaemic heart disease (7·7%) and preterm birth complications (6·3%) were ranked the second and third causes of YLLs, respectively. In 2010, diabetes was the fifth leading cause of YLLs.

HALE increased in all Arab countries—eg, in Lebanon it increased from 61·6 years in 1990 to 67·0 years in 2010. In comparison, HALE in Yemen increased from 59·0 years (95% CI 52·2–65·2) to 62·2 years (54·6–69·6). The change was smaller in Iraq, where life expectancy for both sexes increased by roughly 1 year, largely due to the prolonged war in the first decade of the 21st century. Women in Syria had one of the greatest increases in life expectancy during
the same period, from 73·5 years (95% CI 70·9–76·0) to 80·2 years (78·9–81·4), and in 2010 they had one of the longest lifespans in the region. By contrast, although the life expectancy for men in Yemen increased from 58·4 years (95% CI 51·4–64·1) to 65·5 years (59·2–71·4), they have one of the shortest lifespans in the Arab world.

Our decomposition analysis showed the effect of change in age and sex structure and population growth on the burden of disease measured with DALYs (table 2). The burdens of non-communicable diseases and injuries increased and the burden of infectious diseases decreased from 1990 to 2010 (table 2). 11·4% of the increase in the DALYs for non-communicable diseases was due to population ageing and 54·6% was due to population growth. The rates of DALYs for all causes declined from 1990 to 2010 (table 2).

### Table 3: Top ten causes of disability-adjusted life-years in low-income Arab countries by sex and overall in 1990, 2005, and 2010

<table>
<thead>
<tr>
<th>Male individuals</th>
<th>1990 (%)</th>
<th>2005 (%)</th>
<th>2010 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Diarrhoea</td>
<td>17·1 (13·6–20·7)</td>
<td>11·9 (8·6–15·2)</td>
<td>Lower respiratory infections 11·8% (7·0–16·1)</td>
</tr>
<tr>
<td>2 Lower respiratory infections</td>
<td>14·9% (10·4–18·6)</td>
<td>11·7% (7·3–15·7)</td>
<td>Diarrhoea 10·5% (7·4–14·0)</td>
</tr>
<tr>
<td>3 Malaria</td>
<td>5·3% (2·5–10·2)</td>
<td>Malaria 9·3% (4·2–15·7)</td>
<td>Malaria 6·9% (3·1–12·6)</td>
</tr>
<tr>
<td>4 Protein-energy malnutrition</td>
<td>4·9% (2·9–7·5)</td>
<td>Preterm birth complications</td>
<td>5·1% (3·2–7·9)</td>
</tr>
<tr>
<td>5 Congenital anomalies</td>
<td>4·9% (1·5–7·3)</td>
<td>Congenital anomalies 4·7% (1·9–7·1)</td>
<td>Congenital anomalies 4·4% (2·1–6·5)</td>
</tr>
<tr>
<td>6 Preterm birth complications</td>
<td>4·2% (2·6–6·5)</td>
<td>Protein-energy malnutrition</td>
<td>3·1% (2·0–4·8)</td>
</tr>
<tr>
<td>7 Meningitis</td>
<td>2·3% (1·2–4·6)</td>
<td>Road injury 2·8% (2·1–3·8)</td>
<td>Road injury 3·1% (2·3–4·3)</td>
</tr>
<tr>
<td>8 Road injury</td>
<td>2·2% (1·4–3·4)</td>
<td>Tuberculosis 2·6% (1·7–3·7)</td>
<td>Tuberculosis 2·8% (1·9–3·9)</td>
</tr>
<tr>
<td>9 Tuberculosis</td>
<td>2·2% (1·4–3·2)</td>
<td>Iron-deficiency anaemia 2·4% (1·6–3·3)</td>
<td>Iron-deficiency anaemia 2·5% (1·7–3·6)</td>
</tr>
<tr>
<td>10 Neonatal encephalopathy</td>
<td>1·9% (1·1–2·9)</td>
<td>Neonatal encephalopathy 2·4% (1·5–3·4)</td>
<td>Neonatal encephalopathy 2·5% (1·6–3·8)</td>
</tr>
</tbody>
</table>

### Female individuals

| 1 Diarrhoea      | 16·4% (13·2–19·5) | Lower respiratory infections 12·3% (7·2–15·1) | Lower respiratory infections 12·6% (6·5–18·0) |
| 2 Lower respiratory infections | 14·4% (10·6–17·1) | Diarrhoea 10·8% (7·6–13·9) | Diarrhoea 9·7% (6·8–12·9) |
| 3 Malaria        | 5·8% (3·1–9·8) | Malaria 6·6% (5·1–15·3) | Malaria 7·0% (5·5–14·7) |
| 4 Protein-energy malnutrition | 4·7% (2·9–6·9) | Congenital anomalies 4·3% (1·7–6·7) | Preterm birth complications 4·3% (2·6–6·7) |
| 5 Congenital anomalies | 4·7% (1·4–7·3) | Preterm birth complications 4·1% (2·6–6·5) | Congenital anomalies 4·1% (1·9–6·3) |
| 6 Preterm birth complications | 3·4% (2·0–5·5) | Maternal disorders 3·3% (2·5–4·3) | Maternal disorders 3·4% (2·4–4·7) |
| 7 Maternal disorders | 3·1% (2·2–4·3) | Protein-energy malnutrition 3·2% (2·1–5·2) | Protein-energy malnutrition 3·3% (2·1–5·2) |
| 8 Meningitis      | 2·4% (1·3–4·1) | Iron-deficiency anaemia 2·8% (1·9–4·0) | Iron-deficiency anaemia 3·0% (2·1–4·2) |
| 9 Iron-deficiency anaemia | 2·0% (1·3–2·8) | Major depressive disorder 2·2% (1·4–3·4) | Major depressive disorder 2·9% (1·8–4·4) |
| 10 Stroke        | 0·0% (1·0–3·2) | Stroke 2·1% (1·4–2·9) | Stroke 2·2% (1·5–3·2) |

### Total

| 1 Diarrhoea      | 16·8% (14·0–19·3) | Lower respiratory infections 12·0% (7·7–15·0) | Lower respiratory infections 12·2% (7·4–15·8) |
| 2 Lower respiratory infections | 14·7% (11·1–17·3) | Diarrhoea 11·4% (9·0–13·7) | Diarrhoea 10·2% (7·9–12·6) |
| 3 Malaria        | 5·6% (3·3–8·6) | Malaria 5·4% (3·7–13·9) | Malaria 7·0% (3·8–11·0) |
| 4 Protein-energy malnutrition | 4·8% (3·4–6·6) | Preterm birth complications 4·6% (3·3–6·6) | Preterm birth complications 4·9% (3·4–7·1) |
| 5 Congenital anomalies | 4·8% (2·4–6·7) | Congenital anomalies 4·5% (2·4–6·2) | Congenital anomalies 4·2% (2·4–5·8) |
| 6 Preterm birth complications | 3·8% (2·7–5·6) | Protein-energy malnutrition 3·2% (2·3–4·4) | Protein-energy malnutrition 3·3% (2·4–4·7) |
| 7 Meningitis      | 2·3% (1·4–4·0) | Iron-deficiency anaemia 2·6% (1·8–3·6) | Iron-deficiency anaemia 2·7% (1·9–3·9) |
| 8 Tuberculosis    | 2·0% (1·4–2·7) | Tuberculosis 2·3% (1·7–3·0) | Tuberculosis 2·4% (1·8–3·2) |
| 9 Stroke         | 1·8% (1·2–2·4) | Road injury 2·1% (1·6–2·6) | Road injury 2·3% (1·9–3·0) |
| 10 Iron-deficiency anaemia | 1·8% (1·2–2·5) | Neonatal encephalopathy 2·1% (1·5–2·8) | Ischaemic heart disease 2·2% (1·8–2·7) |

Data are the percentage contribution of the disease to all disability-adjusted life-years (DALYs) in that year (95% uncertainty interval). Total number of DALYs in low-income countries was 18 530 000 in 1990, 19 203 000 in 2005, and 20 127 000 in 2010. Rankings are based on absolute estimates. Low-income Arab countries are Comoros, Djibouti, Mauritania, Yemen, and Somalia.
and major depressive disorder had the highest prevalence in young adults compared with other age groups (appendix p 18).

Childhood underweight and suboptimal breastfeeding were the top two DALY-attributable risk factors in 1990, 2005, and 2010 in LICs, representing 8·3% and 6·8% of the total burden in 2010, respectively (appendix p 8). LICs had major declines in risk attributable to unimproved water (2·3% in 1990) and sanitation (3·3% in 1990) from 1990 (appendix p 8). The only exception was in Somalia where sanitation risks ranked tenth and unimproved water risks ranked eighth on the DALY-attributable risk factor list in 2010. Dietary risk factors were ranked second in Comoros, Djibouti, and Mauritania and fifth in Somalia. Raised blood pressure ranked first for death-attributable risks in 2010 for all LICs with the exception of Yemen and Somalia, where dietary risks and childhood underweight were the top risks for death. In Djibouti, HIV/AIDS was the number one cause of death in 2010, rising from number 58 in 1990. Measles-associated deaths in 1990 ranked eighth in Djibouti and 11th in Comoros, but dropped to 58th and 65th, respectively, in 2010.

Ischaemic heart disease and stroke were the leading causes of death in MICs in 2010 (appendix p 9). MICs have had a transition in the burden of disease since 1990, with an increase in some non-communicable diseases and decline in communicable, maternal, neonatal, and nutritional disorders (appendix p 19). Diarrhoeal diseases as a cause of death have dropped in rank from fourth in 1990 to 11th in 2010. Similarly, protein-energy malnutrition has declined from eighth in 1990 to 17th in 2010 (appendix p 19).

## Table 4: Top ten causes of disability-adjusted life-years in middle-income Arab countries by sex and overall in 1990, 2005, and 2010

<table>
<thead>
<tr>
<th>1990</th>
<th>2005</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male individuals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Lower respiratory infections</td>
<td>Lower respiratory infections</td>
</tr>
<tr>
<td>2</td>
<td>Diarrhoea</td>
<td>Ischaemic heart disease</td>
</tr>
<tr>
<td>3</td>
<td>Preterm birth complications</td>
<td>Preterm birth complications</td>
</tr>
<tr>
<td>4</td>
<td>Congenital anomalies</td>
<td>Stroke</td>
</tr>
<tr>
<td>5</td>
<td>Ischaemic heart disease</td>
<td>Diarrhoea</td>
</tr>
<tr>
<td>6</td>
<td>Stroke</td>
<td>Road injury</td>
</tr>
<tr>
<td>7</td>
<td>Road injury</td>
<td>Low back pain</td>
</tr>
<tr>
<td>8</td>
<td>Protein-energy malnutrition</td>
<td>Congenital anomalies</td>
</tr>
<tr>
<td>9</td>
<td>Neonatal encephalopathy</td>
<td>Major depressive disorder</td>
</tr>
<tr>
<td>10</td>
<td>Low back pain</td>
<td>Neonatal encephalopathy</td>
</tr>
<tr>
<td><strong>Female individuals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Lower respiratory infections</td>
<td>Lower respiratory infections</td>
</tr>
<tr>
<td>2</td>
<td>Diarrhoea</td>
<td>Major depressive disorder</td>
</tr>
<tr>
<td>3</td>
<td>Preterm birth complications</td>
<td>Ischaemic heart disease</td>
</tr>
<tr>
<td>4</td>
<td>Congenital anomalies</td>
<td>Preterm birth complications</td>
</tr>
<tr>
<td>5</td>
<td>Ischaemic heart disease</td>
<td>Diarrhoea</td>
</tr>
<tr>
<td>6</td>
<td>Major depressive disorder</td>
<td>Stroke</td>
</tr>
<tr>
<td>7</td>
<td>Stroke</td>
<td>Low back pain</td>
</tr>
<tr>
<td>8</td>
<td>Protein-energy malnutrition</td>
<td>Congenital anomalies</td>
</tr>
<tr>
<td>9</td>
<td>Iron-deficiency anaemia</td>
<td>Iron-deficiency anaemia</td>
</tr>
<tr>
<td>10</td>
<td>Low back pain</td>
<td>Diabetes</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Lower respiratory infections</td>
<td>Lower respiratory infections</td>
</tr>
<tr>
<td>2</td>
<td>Diarrhoea</td>
<td>Ischaemic heart disease</td>
</tr>
<tr>
<td>3</td>
<td>Preterm birth complications</td>
<td>Preterm birth complications</td>
</tr>
<tr>
<td>4</td>
<td>Congenital anomalies</td>
<td>Stroke</td>
</tr>
<tr>
<td>5</td>
<td>Ischaemic heart disease</td>
<td>Diarrhoea</td>
</tr>
<tr>
<td>6</td>
<td>Stroke</td>
<td>Major depressive disorder</td>
</tr>
<tr>
<td>7</td>
<td>Protein-energy malnutrition</td>
<td>Low back pain</td>
</tr>
<tr>
<td>8</td>
<td>Major depressive disorder</td>
<td>Congenital anomalies</td>
</tr>
<tr>
<td>9</td>
<td>Low back pain</td>
<td>Road injury</td>
</tr>
<tr>
<td>10</td>
<td>Neonatal encephalopathy</td>
<td>Iron-deficiency anaemia</td>
</tr>
</tbody>
</table>

Data are the percentage contribution of the disease to all disability-adjusted life-years (DALYs) in that year (95% uncertainty interval). Total number of DALYs in middle-income countries in 1990 was 81,085,000 in 1990; 81,393,000 in 2005; and 81,314,000 in 2010. Rankings are based on absolute estimates. Middle-income Arab countries are Algeria, Egypt, Iraq, Jordan, Lebanon, Libya, Morocco, Palestine, Sudan, Syria, and Tunisia.
Ischaemic heart disease was the leading cause of DALYs in MICs in 2010 for male individuals, whereas major depressive disorder was the highest for female individuals (table 4). Cardiovascular and other circulatory diseases were the most common causes of death in people aged 40 years or older in MICs in 2010 (appendix p 39). Individuals aged 15–34 years of age had the highest risk of disability associated with mental and behavioural disorders in the same year (appendix p 20).

Low back pain was ranked as the sixth cause of DALYs in MICs for 2010 (table 4). Major depressive disorders rose from 1990 to 2010 (table 4).

Diet and raised blood pressure were the highest risk factors for DALYs in MICs (appendix p 45). DALY-attributable risk factors for suboptimal breastfeeding and childhood underweight declined between 1990 and 2010, and risk factors for non-communicable diseases such as raised BMI, FPG, and cholesterol increased (appendix p 45).

Major depressive disorder ranked second in Algeria, Libya, Syria, and the occupied Palestinian territory, third in Lebanon and Tunisia, and fourth in Morocco for causes of DALYs in 2010. Iron-deficiency anaemia remained the tenth cause of DALYs for MICs in 2010 (table 4). It ranked sixth in Syria, seventh in Sudan, and eighth in Lebanon. Tuberculosis was not a major cause of DALYs in most MICs with the exception of Morocco where it ranked tenth, Sudan 16th, and Algeria 22nd. Both childhood underweight and suboptimal breastfeeding continued to be major risks in Sudan, ranking first and third, respectively, on the DALYs risk factor list in 2010. Patterns of causes of death in Sudan, a lower-class MIC, were more similar to the

<table>
<thead>
<tr>
<th>Year</th>
<th>Male individuals</th>
<th>Female individuals</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>Road injury 10.7% (8·3–13·6)</td>
<td>Preterm birth complications 10·3% (7·1–14·1)</td>
<td>Preterm birth complications 10·0% (7·5–13·7)</td>
</tr>
<tr>
<td>2</td>
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Data are the percentage contribution of the disease to all disability-adjusted life-years (DALYs) in that year (95% uncertainty interval). Total number of DALYs in high-income countries in 1990 was 5·800·000 in 1990, 7·068·000 in 2005, and 8·612·000 in 2010. Rankings are based on absolute estimates. High-income Arab countries are Bahrain, Saudi Arabia, Kuwait, Oman, Qatar, and the United Arab Emirates.

Table 5: Top ten causes of disability-adjusted life-years in high-income Arab countries by sex and overall in 1990, 2005 and 2010
patterns in LICs, with lower respiratory infections, diarrhoeal diseases, and HIV/AIDS ranking first, second, and third, respectively, in 2010.

Non-communicable diseases and road injuries were the leading causes of death in the HICs (appendix p 13). Road injuries were a major cause of death in HICs in 2010, ranking second, with fire-related injuries, drowning, falls, and self-harm ranking 16th, 19th, 20th, and 25th, respectively (appendix p 21). Lower respiratory infections and preterm birth complications remained major causes of death in these wealthy countries, ranking fourth and seventh, respectively, in 2010 (appendix p 21).

In 2010, road injuries and major depressive disorder were the top two causes of DALYs in HICs (table 5). The highest burden of major depressive disorder was in individuals aged 20–39 years (appendix p 22). Road traffic injuries were higher in people aged 15–49 years (appendix p 22). Cardiovascular disease burden was the highest in people aged 50–59 years (appendix p 22).

Preterm birth complications ranked first, lower respiratory infections ranked sixth, and iron-deficiency anaemia ranked eighth on the DALYs cause list for HICs in 1990, dropping to sixth, 16th, and 11th positions, respectively, in 2010 (table 5 and appendix p 52). Dietary factors were the leading risk for death in all HICs in 2010 with the exception of Saudi Arabia where raised blood pressure ranked higher. Household air pollution was not a noticeable risk factor for death in HICs. However, occupational risks were higher in HICs than the global estimates, ranking ninth in Kuwait, Oman, Qatar, and Saudi Arabia, and tenth in the United Arab Emirates and Bahrain. Ischaemic heart disease and cardiovascular disease were the first and second causes of death in Kuwait and Saudi Arabia, whereas chronic kidney disease ranked sixth in Oman, Saudi Arabia, and Bahrain, eighth in Kuwait, and ninth in Qatar. Road injuries caused the greatest number of deaths in Qatar, and were the second highest cause of death in the United Arab Emirates and Oman, and third highest in Saudi Arabia, Bahrain, and Kuwait in 2010.

**Discussion**

The Arab world has made great progress in reducing the number of deaths from diseases and injuries and prolonging life. Over the past 20 years, it has succeeded in decreasing premature death and disability from most communicable, newborn, nutritional, and maternal causes with the exception of HIV/AIDS. Despite improvements, substantial burden of communicable, newborn, nutritional, and maternal causes persist in the Arab LICs. As far as we know, this study is the first in which the changes in the burden of diseases, injuries, and risk factors in the Arab world from 1990 to 2010 have been detailed (panel).

The Arab world is undergoing a major epidemiological transition. Between 1990 and 2010, disease burden from many non-communicable causes increased, especially ischaemic heart disease, mental disorders such as depression and anxiety, musculoskeletal disorders including low back pain and neck pain, diabetes, and chronic kidney disease. Indeed, the epidemiological profile closely resembles that of countries in western Europe, the USA, and Canada, with health loss from most non-communicable diseases, such as depression, increasing over the past 20 years. Today, disorders related to drug and alcohol use are causing more premature death and disability in the Arab world than they were two decades ago. As use of motor vehicles has increased in countries in the Arab world, road injuries have taken a growing toll on human health. Some of the increase in road injuries might be due to inadequate road safety and patterns of driving. The region has also seen a rapid increase in injuries associated with interpersonal violence and self-harm, but a decline in injuries from fire, drowning, and poisonings.

The Arab world has made tremendous improvements in the reduction in the numbers of child and maternal deaths and in increasing life expectancy. Although some countries in the Arab world have done better than other countries in the past 20 years, further improvements are still needed. However, with all the political turmoil in the region and the challenges faced by some countries, this progress is noticeable and a major success. Several reasons for this success include the strong family and social support that are part of the culture in the Arab world.30,31

The Arab world has many health challenges for the future, particularly non-communicable diseases.32 The rapid rise in non-communicable diseases has led to the Riyadh Declaration,11 which calls for programmes and policies to reduce the burden of chronic diseases and has been adopted by all countries in WHO’s Regional Office for the Eastern Mediterranean.

In the Arab world, a greater proportion of healthy years were lost from disability in 2010 than in 1990. The leading causes of disability in the region largely mirrored global trends as reported in GBD 2010.10 Mental disorders, such as depression and anxiety, and low back pain, neck pain, and other musculoskeletal disorders were dominant causes of disability. Iron-deficiency anaemia was a main cause of years lived with disability (appendix p 24). By comparison with global trends, disorders related to drug use ranked higher, and chronic obstructive pulmonary disease (COPD) ranked lower as a cause of disability in the region.

Although the trends in the Arab world were largely consistent with the global patterns, some non-communicable diseases were much more prominent causes of premature death and disability than they were worldwide. Depression and anxiety were major causes of burden and affected female individuals more than they affected male individuals. Reports have shown an increasing prevalence of major depressive disorder in several Arab counties due to wars and economic conditions.33,34 Another cause that ranked higher in the Arab world than in the world overall was cirrhosis. For example, in Egypt, mass injecting campaigns for parenteral antischistosomal therapy resulted in increased transmission of hepatitis C virus.35 Conversely,
the Arab world did well in some areas when compared with worldwide. Indeed, the burden of malaria and diarrhoea decreased at a better rate than worldwide because of aggressive preventive programmes and funding from donors in LICs.

In many regions, including the Arab world, COPD is in the list of the top ten causes of disability. COPD is caused by potentially modifiable risk factors such as smoking, second-hand smoke, and air pollution. Smoking is a major cause of morbidity and mortality in the Arab world. Some recent successes in changing tobacco policy have been reported—eg. Lebanon has banned smoking in restaurants. Unfortunately, some Arab countries have had major setbacks in the enforcement of smoking-related laws and regulations. The rapid increase in non-communicable diseases in the Arab world suggests that the change in disease burden is a result of a change in behaviours rather than genetic make-up. Clearly, Arabs have become less physically active and consume an unhealthy diet. The rapid transitions in diet and physical inactivity suggest that major societal changes are occurring in the Arab world. Indeed, the new wealth from oil in Arab countries bordering the Persian Gulf has made food abundant throughout the year at very affordable prices for locals. Arab nationals used to spend most of their time outdoors, now everyone is almost always inside in an air-conditioned environment, and physical activity has declined. A call for a return to a traditional diet and active lifestyle is urgently needed because risk factors such as high blood pressure and low consumption of fruit, nuts, seeds, and wholegrains in the diet, overweight and obesity, and physical inactivity have become important threats to public health.

Arab countries are faced with an increased cost of medical care due to the shifting burden of disease. Our study shows that the rise in burden of non-communicable diseases is driven by demographic changes and not by increasing rates (table 2). The Arab world has a young population and as it ages, the burden of non-communicable diseases will be very large. Indeed, chronic diseases are costly. Moreover, many Arab countries are dealing with a double burden of both infectious diseases and non-communicable diseases. This situation will put a lot of stress on already poor human and financial resources. Unfortunately, many countries are investing in treatment rather than prevention and long-term planning. A road map for health in the Arab world is urgently needed. Arab countries should use the lessons from other developed regions of the world that have been successful in reducing the risk factors related to non-communicable diseases.

A major challenge for Arab health ministries is the enforcement of policies and laws. Indeed, corruption and tense political situations have enabled many to disregard laws or policies. Unfortunately, in many Arab countries children can buy tobacco and smoke shisha. A comprehensive programme including law enforcement and other stakeholders is needed. The success of prevention will need the involvement of several ministries and the public. Prevention should be part of the health reform in the Arab world.

Most Arab countries have weak health information systems. The vital statistics in most Arab countries are non-existent, which produces challenges for sound policy and prevention programmes. Indeed, some of the health information responsibilities are not managed by ministries of health. For example, in some countries the Ministry of Interior is in charge of death registries. A call to establish (in most) and improve (in some) health information systems is necessary. The new systems should include vital statistics, ongoing health surveys for risk factors, laboratory reporting, capture of encounters at medical contact, and medical facilities’ capacities and performance. Clearly, a major focus of the new system should be surveillance and monitoring of non-communicable diseases.

Our study has some limitations. The lack of data for some Arab countries and the quality of data for many was challenging. For some countries, the data for non-national individuals might not be completely reliable. Furthermore, we present national burden of disease. Indeed, many of the Arab countries have disparities in health in terms of exposure to risk factors, access to health care, and outcomes of care. However, variation within the countries in each of the three groups can be seen. Some of the trends we report might possibly be a result of an improvement in diagnosis. Additionally, we did not discuss the effect of several wars in the region during our study period; however, our analyses did account for the effect of war on...
health. Finally, huge disparities exist in countries and between countries in the Arab world, and a double burden from a risk factor might exist in a country (eg, malnutrition and obesity).

Arabs are heavily involved in politics and have advocated for and won political changes in some countries. However, health-related discussions so far have been timid compared with discussions about food prices, employment opportunities, and voting procedures. Arabs need to get involved in health policies in their countries with a level of engagement similar to that for economic or political policies; health reform has to start at the personal level.

The demographic and social factors for the Arab countries have a major effect on the health outcomes in the region. Some of the major issues for maternal and child health in these countries are female education and early marriage. Maternal education has been shown to be a major factor for maternal and child health. As technology and economic advances occur in Arab countries, efforts should be made to increase education, especially for women and girls. Moreover, efforts should be made to decrease health disparities within each country by eliminating privileges of specific groups and ensuring equal access and coverage for preventive and treatment measures. Religion has been a major factor in the region. Therefore, involvement of religious leaders in health messaging is crucial.

In this report we have not discussed the effect on health of the recent Arab uprising, because our data are based on the GBD 2010 results, which predate most of the major events. Indeed, new updates of GBD will show the effect of recent events on health in many Arab countries. Unfortunately, many of the successes that we report here might now be lost because of war and a shortage of health services such as sanitation, surveillance, and immunisation programmes, leading to disease outbreaks. Similarly, political changes such as the separation of South Sudan from Sudan in 2011 will also lead to a different burden of disease in the new Sudan compared with previous GBD estimates.

Our findings can help decision makers to establish health-service priorities when there are few resources. Moreover, comparison of how well countries are performing in health relative to other countries will generate hypotheses for causes and lead to better health solutions. Indeed, countries could benefit by learning from the successes with preventive and policy programmes in other countries, especially neighbouring ones. However, differences in population growth and age distributions across countries can make a country with a younger population seem better in terms of health than a country with an older population. Similarly, countries with low population growth will accumulate less disease burden over time than will countries with a fast-growing population. The GBD approach offers countries a unique opportunity to explore their success in improving health outcomes over time. GBD can also be used to better understand how fast a country’s health is improving relative to similar countries. We encourage researchers and health professionals to use our findings to promote health and wellbeing in the Arab world.

Contributors
AHM, SJ, ADL, and CJLM prepared the first draft. AHM, SJ, and CJLM finalised the draft on the basis of comments from the other authors and reviewer feedback. AHM, SJ, CJLM, CA, CEB, FD, MHF, DG-M, KL-K, MN, and AAM had key roles in the formulation and execution of the analysis. All authors commented on and reviewed the results in the report.

Conflicts of interest
We declare that we have no conflicts of interest.

Acknowledgments
Bill & Melinda Gates Foundation provided funding for this study.

References
Articles


40 Mokdad AH, Warren CW. As if cigarettes were not enough, here comes narghile. A commentary on an article by Yunus et al in JPHM 2007; 52:263–64.


Since late 2010, the Arab world has entered a tumultuous period of change, with populations demanding more inclusive and accountable government. The region is characterised by weak political institutions, which exclude large proportions of their populations from political representation and government services. Building on work in political science and economics, we assess the extent to which the quality of governance, or the extent of electoral democracy, relates to adult, infant, and maternal mortality, and to the perceived accessibility and improvement of health services. We compiled a dataset from the World Bank, WHO, Institute for Health Metrics and Evaluation, Arab Barometer Survey, and other sources to measure changes in demographics, health status, and governance in the Arab World from 1980 to 2010. We suggest an association between more effective government and average reductions in mortality in this period; however, there does not seem to be any relation between the extent of democracy and mortality reductions. The movements for changing governance in the region threaten access to services in the short term, forcing migration and increasing the vulnerability of some populations. In view of the patterns observed in the available data, and the published literature, we suggest that efforts to improve government effectiveness and to reduce corruption are more plausibly linked to population health improvements than are efforts to democratis. However, these patterns are based on restricted mortality data, leaving out subjective health metrics, quality of life, and disease-specific data. To better guide efforts to transform political and economic institutions, more data are needed for healthcare access, health-care quality, health status, and access to services of marginalised groups.

Background
Uprisings and protests in the Arab world have emphasised social and economic inequity, absence of political accountability, and concerns about government corruption. Although the optimism for more inclusive and effective governance throughout the region has now given way to concerns about the rise of patriarchal conservatism, civil war, and political instability in some countries, the demand for more inclusive and equitable government in the region has been heard. The toppling of regimes in Egypt and Tunisia by popular protest in 2011, and the removal of a dictatorship in Libya by an alliance of activists, domestic fighters, and international forces, created hope for the creation of governments that respond to the needs of their population throughout. However, this hope is coupled with a concern that antidemocratic impulses can occur in post-revolt or interim periods, as seen in Egypt. The optimism for reform is also coupled with brutal realities about the use of force against civilians, and even health-care personnel, by regimes attempting to remain in power. In Syria and Bahrain, the governments have responded to demands for political change with a brutal use of force. And, in Syria, conflict has escalated with the government’s increasing use of force and the involvement of foreign fighters, leading to a catastrophe for the population. In Saudi Arabia and Jordan, governments have tried to quell domestic pressures with social reforms. The uprisings have increased awareness of the need for political freedom and social justice throughout the Arab world—an awareness that can potentially be harnessed for reform. This Series on health in the Arab world addresses the shared challenges in improving health, from taking on non-communicable diseases and tobacco control, to mitigating the health effects of war and environmental change, and finally building health systems allowing for universal access.3,4

The 22 countries in the Arab world are diverse, ranging from oil-rich states of the Persian Gulf with long-life expectancy and low maternal mortality, to poor states with poor governance and poor health indicators, such as Yemen and Somalia (table; panel 1; figure 1). Although the regimes governing these countries are shaped by an often shared colonial legacy, and Cold War politics, the region is highly diverse.5 In this Series, we consider the 22 Arabic-speaking nations, concentrated in the Middle East and North Africa. The Arab world, as a whole, is near the global averages in terms of poverty and inequality (World Bank data; panel 1). And, although social inequality is often pointed to as an impetus for the Arab uprisings, as Cammett and Diwan note, neither economic growth rates nor absolute levels of income inequality can explain popular movements that have emerged to overthrow dictators. Instead, the perceptions of socioeconomic trends, driven by declining welfare regimes and the rollback of the state, could be more explanatory.6 The Arab world has life expectancy and infant mortality indicators that are at or better than the global averages (figure 2). Life expectancy and under-5 mortality have improved more in the Arab world in the past 30 years than in any other region (figure 2). These sharp improvements in human development could have, as has been argued, shaped the path to revolution, as an increasingly educated youth with high expectations began to place pressure on their governments, and weaken their bond with the state.7

What distinguishes the Arab world—almost as much as the Arabic language itself—is the absence of political
accountability throughout the region. The core concept of accountability is that stakeholders being held accountable (those who have power) have obligations to act in ways that are consistent with accepted standards of behaviour and that they will be sanctioned for failures to do so. In democratic states, elections are a frequent operative instrument of accountability, but they neither always serve that role nor do they hold a monopoly on accountability. Across the Arab world, political systems are often dominated by elites and do not have ways to

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<th>Under-5 mortality rate‡</th>
<th>Maternal mortality rate§</th>
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<td>Comoros</td>
<td>1990</td>
<td>438</td>
<td>$571</td>
<td>72.6%</td>
<td>55.6</td>
<td>121.7</td>
<td>449.9</td>
<td></td>
<td>-4</td>
<td></td>
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<tr>
<td>Djibouti</td>
<td>1990</td>
<td>562</td>
<td>$804</td>
<td>22.9%</td>
<td>53.4</td>
<td>121.6</td>
<td>606.5</td>
<td></td>
<td>-8</td>
<td></td>
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<tr>
<td>Egypt</td>
<td>1990</td>
<td>56843</td>
<td>$759</td>
<td>14.7%</td>
<td>62.0</td>
<td>85.7</td>
<td>195.4</td>
<td></td>
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<tr>
<td>Libya</td>
<td>1990</td>
<td>4334</td>
<td>$6669</td>
<td>32.4%</td>
<td>68.1</td>
<td>44.1</td>
<td>124.3</td>
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<tr>
<td>Mauritania</td>
<td>1990</td>
<td>1996</td>
<td>$511</td>
<td>16.1%</td>
<td>55.9</td>
<td>124.7</td>
<td>1395.4</td>
<td></td>
<td>-7</td>
<td></td>
</tr>
<tr>
<td>Morocco</td>
<td>1990</td>
<td>3542</td>
<td>$1151</td>
<td>21.9%</td>
<td>58.5</td>
<td>112.1</td>
<td>-0.9</td>
<td>-0.57</td>
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<td>Somalia</td>
<td>1990</td>
<td>6599</td>
<td>$139</td>
<td>7.7%</td>
<td>44.5</td>
<td>180.0</td>
<td>962.8</td>
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<tr>
<td>Sudan</td>
<td>1990</td>
<td>20457</td>
<td>$468</td>
<td>0.0%</td>
<td>52.5</td>
<td>122.8</td>
<td>592.6</td>
<td></td>
<td>-7</td>
<td></td>
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<tr>
<td>Tunisia</td>
<td>1990</td>
<td>8154</td>
<td>$1507</td>
<td>5.3%</td>
<td>70.3</td>
<td>51.1</td>
<td>141.2</td>
<td></td>
<td>-5</td>
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</tr>
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<td>Levant</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Iraq</td>
<td>1990</td>
<td>18194</td>
<td>$4297</td>
<td>44%</td>
<td>67.5</td>
<td>46.0</td>
<td>211.7</td>
<td></td>
<td>-9</td>
<td></td>
</tr>
<tr>
<td>Jordan</td>
<td>1990</td>
<td>3170</td>
<td>$1268</td>
<td>0.0%</td>
<td>70.4</td>
<td>36.7</td>
<td>102.5</td>
<td></td>
<td>-4</td>
<td></td>
</tr>
<tr>
<td>Lebanon</td>
<td>1990</td>
<td>2948</td>
<td>$963</td>
<td>0.0%</td>
<td>68.7</td>
<td>33.1</td>
<td>76.4</td>
<td></td>
<td>-9</td>
<td></td>
</tr>
<tr>
<td>Occupied Palestinian territory</td>
<td>1990</td>
<td>1978</td>
<td>$999</td>
<td>14.4%</td>
<td>68.0</td>
<td>43.1</td>
<td>91.8</td>
<td></td>
<td>-9</td>
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Complete dataset available from authors on request. Data from World Bank, Institute for Health Metrics and Evaluation, WHO, and Polity IV project (panel 1). GDP=gross domestic product. *Population in 1000s. †Oil rent data from 2010–11. ‡Deaths per 1000 livebirths. §Deaths per 100 000 livebirths.

Table: Demographic, health, and governance indicators for the Arab world.
address the population’s broader concerns, showing the neglect of operative methods for accountability. Additionally, as discussed in other papers in this Series, many states in the Arab world have abandoned or disregarded contracts of trust with their citizens, through neglect of public services and segments of the population, or the use of violence against their own populations. Another distinguishing feature is the extent of external intervention in the form of colonialism, economic sanctions, foreign aid, military assistance, and military conflict that have contributed to, but do not fully explain, the failure to establish accountable and inclusive political systems in the Arab world. These political factors might explain variations in access to health services and health outcomes, complementing epidemiological or social factors typically considered by public health researchers. In this paper, we discuss the effect of governance type and quality on health; however, we do not address all the political factors that might affect health outcomes, such as foreign economic and military intervention, state violence, ethnic or religious fragmentation and diversity, civil war, patronage networks, or the political power of the medical profession.

Government political accountability drives the adequate and fair distribution of national public goods. In republics, pension plan coverage is double that in monarchies (44% vs 22%, respectively), which suggests that regimes dependent on their social achievements for stability are more likely to provide for their population. Another factor in determining provision of public goods could be social division, or what political scientists use measures of the distribution of these public goods as a measure of government political accountability. In republics, pension plan coverage is double that in monarchies (44% vs 22%, respectively), which suggests that regimes dependent on their social achievements for stability are more likely to provide for their population.

Another factor in determining provision of public goods could be social division, or what political scientists have referred to as fractionalisation, which can occur on social, ethnic, or religious grounds. Countries that have greater social divisions have less access to health care, higher child and maternal mortality rates, and less investment in public goods. In regions with high ethnic fragmentation, the health benefits of democracy are not realised, perhaps because of policies that deprive minority groups.

The role of governance in shaping health

To establish a causal pathway for governance and health, scholars have been divided about whether it is democracy or governance effectiveness that leads to improvements in health and human development. Although definitions of democracy vary and are subject to extensive debate, most studies relating democracy and health consider electoral democracy, as scored by the Polity IV project (panel I), which is based on the competitiveness, openness, and level of participation in elections. These measures of electoral democracy do not judge the extent to which governments actually respond to population demands, but more narrowly capture the extent to which they hold good elections. Scholars arguing for a causal part played by democracy in improving welfare suggest that democracy leads to increased social spending, and accountability leading to redistribution of resources to people with a low income, which in turn leads to improved welfare. However, critics point out that outside of countries of the Organisation for Economic Co-operation and Development, public spending and human development are not correlated, and that democracy has little or no effect on maternal and child mortality rates. Furthermore, countries transitioning to democracy can take a step back in human development because young democracies are increasingly prone to instability and conflict, and are likely to have weak political institutions that are unable to deliver services effectively. An alternative thesis linking democracy to human development is that a country’s so-called stock of

Panel 1: Data sources

We constructed a dataset including data for demographics, epidemiology, and governance in the 22 countries in the Arab world from 1980 to 2012. A sample of some core data are in table 1, and the full dataset is available from the authors on request. A description of key sources is below.

Arab Barometer Survey

A 2010–11 representative survey across ten Arab countries, including Jordan, occupied Palestinian territory, Lebanon, Egypt, Sudan, Algeria, Morocco, Yemen, Saudi Arabia, Kuwait, Mauritania, Syria, and Iraq. The survey seeks to measure citizen attitudes, values, and behaviour patterns relating to pluralism, freedoms, tolerance, and equal opportunity; social and interpersonal trust; social, religious, and political identities; conceptions of governance and an understanding of democracy; and civic engagement and political participation.

World Development Indicators 2012 (World Bank)

These indicators, collected from 1980 to 2011, provide internationally comparable statistics about development and the quality of people’s lives. We used data for population sizes, economic growth, gross domestic product, oil rents, and others to contextualise health developments within their unique socioeconomic political environments.

Institute for Health Metrics and Evaluation (IHME) mortality statistics

From the IHME Global Health Data Exchange, adult mortality rates (1970–2010), maternal mortality rates (1980–2008), and infant and child mortality rates (1970–2010) were collected to measure health outcomes and progress towards Millennium Development Goals 4 and 5. IHME combines registry data, surveys, and censuses to produce mortality estimates.

Worldwide Governance Indicators

These indicators, assembled by the World Bank and the Brookings Institution from 1996 to 2011, summarise the views on the quality of governance collected from survey institutes, think tanks, non-governmental organisations, international organisations, and the private sector.

Polity IV Dataset

The Polity2 score is a measurement of a political regime, widely used in political science. Negative scores show an autocratic regime, positive scores show a democratic government. The Polity IV project is a project from the University of Maryland, MD, USA, and Colorado State University, CO, USA, characterising regimes from 1800 to 2011.

Appendix p 2 shows the key variables provided by each data source.
democracy—its experience over decades—leads to the creation of a strong civil society, the empowerment of oppressed groups, and higher quality political institutions, leading to pronounced improvements in human development in the long term.25,26

Other researchers have suggested that it is not electoral democracy that leads to improvements in health and human development, but rather high quality bureaucratic governments, which exercise power impartially and are able to deliver public services.27 The most widely used measurements for government effectiveness are from the Worldwide Governance Indicators (WGI; panel 1). These cross-country measures assess several components of governance on the basis of international expert surveys collected since 1996. These measures, produced through collaboration between the World Bank and Brookings Institution, combine 30 data sources, bringing together metrics for governance quality from research institutes, international organisations, non-governmental organisations (NGOs), and the private sector, and include citizen and expert survey data. In the WGI studies, government effectiveness is measured on the basis of perceptions of the quality of public services, the civil service (including freedom from political pressures), the quality of policy formulation, and the government’s commitment to these policies. Researchers using these governance indicators have identified some factors that are likely to lead to ineffective government—eg, a high dependence on oil and gas rents worsens corruption, bureaucratic quality, and legal impartiality, which are problems that might be expected in Arab countries deriving a high portion of gross domestic product from oil rents.28 However, in the Arab world, no clear relation exists between oil rents and government effectiveness as measured on the basis of WGI indicators. Additionally,
As Tell6 points out in an Essay in this Series, these colonial institutions persist across the Arab world today.油 profits and foreign assistance. The remains of the need to tax and respond to their citizens, including institutions, and external rents freeing governments of the legacy of colonialism, informal local social and accountable political institutions in the Arab world, to health care, sometimes excluding women and ethnic health system with a high country’s average government effective

tion of the stock of democracy, we also consider a country’s average government effectiveness from 1998 to 2010 (figure 3), based on the notion that a country’s long-term experience with effective government could shape mortality.

So far, public health researchers have given little attention to how regimes govern and the effectiveness of their governance. Although our focus here is on the Arab world, a region undergoing upheaval, these analyses might offer insights into the relation between governance and health globally. The primary dilemma is the inequity created by political exclusion, in which a two-tiered health system with a high-technology private sector caters to elites, whereas a second-rate system serves the wider public, and in which political loyalties shape access to health care, sometimes excluding women and ethnic and political minorities.

There are many reasons for the shortage of inclusive and accountable political institutions in the Arab world, including the legacy of colonialism, informal local social institutions, and external rents freeing governments of the need to tax and respond to their citizens, including oil profits and foreign assistance. The remains of colonial institutions persist across the Arab world today. As Tell6 points out in an Essay in this Series, these colonial legacies might play an important part in explaining underdevelopment in the Arab world. Acemoglu and colleagues6 described how regions where colonial states set up extractive political institutions remain poorer today, even when accounting for geography. Extractive political institutions were usually created to reap the material benefits of colonialism—including oil and access to trade routes—without having to settle in a place where colonial settler mortality was high. Although direct colonialism has largely ended, with the possible exception of the occupied Palestinian territory, extractive colonial institutions have often been replaced by extractive local institutions.11

A complementary explanation for the poor popular political participation in the region is that the formal governmental institutions of nowadays were built on a foundation of informal institutions, based on kinship, tribes, and religious organisations. The interaction of colonial, neocolonial, and local institutions has been shown to shape state formation and economic development in other regions.26 Some scholars suggest that these informal political institutions are stronger and more pervasive than are formal governmental institutions in the Arab world, and continue to help with commerce, social services, and local collective action.11 Nowadays, throughout much of the Arab world, Islamic and other organisations have established systems of social services and representation that allow for political participation outside of state institutions.16–18 Yet, these same institutions might also explain the absence of political inclusiveness in formal state institutions. Governments across the region have incorporated these informal networks, and their rules for resource allocation, into their parliaments, transforming government institutions into “agents of patronage and kinship and detracting them from their public service role”.14

A third explanation for the absence of political inclusiveness in the Arab world is the persistence of external forces keeping autocratic regimes in power. Support to such regimes, such as those in Bahrain and Saudi Arabia, includes oil revenues and military alliances in exchange for their support of US and European military and security efforts in the region. The history of external forces in the region, war, conflict, and the long-term effects of oil dependence and resulting deterioration of environments and lifestyle are discussed in greater detail in other papers in this Series.7,19

The aggregate metrics measuring electoral democracy and governance quality do not fully capture the exclusion of women and minorities from the political process. Women and minorities are most prominently excluded from the political process in the Arab world, with potential consequences for access to health care. Compared with women across the world, Arab women have markedly less rights to political participation, and have only 5.7% of parliamentary seats in the region (compared with 15% in sub-Saharan Africa and 12.9% in Latin America).16,24 Six of the 16 countries scoring lowest for their discriminatory laws and societies regarding women are in the Arab world, according to the World Economic Forum’s Gender Gap Index.19 Arab women have experienced deterioration of their political rights after the deployment of US military troops to a country—eg, Iraq.19 This deterioration could be because troop presence weakens political regimes making them less likely to stand up to Islamists and traditionalists’ opposition to women’s rights.19 Women in the Arab world are less likely to be educated, less likely to be physically active, more likely to be victims of intimate partner violence, and more likely to be obese than are men. Additionally, Arab women have the world’s lowest rates of labour force participation, among the world’s
highest rates of female illiteracy, face discriminatory laws, and are hampered by sexist mentalities. Despite these setbacks, overall and maternal mortality rates of women aged 15–45 years have improved throughout the region since 1980. Similar to women, minority groups and migrant workers also face discrimination and political exclusion.

Across the Arab world, communities are excluded from social services on the basis of their country or region of origin and religion. Immigrant labourers—mainly from south and southeast Asia—in the countries of the Persian Gulf, refugees from the occupied Palestinian territory in many Arab countries, stateless Bedouins, and ethnic and religious groups (eg, Kurds living in border areas) are all discriminated against in the provision of social services. These non-citizen groups form most of the population in some Arab countries—eg, in Qatar, three of four residents are non-citizens. In the Arab states of the Persian Gulf, where most of the population in some states are migrant workers, less than 30% of the population are covered in pension plans and social insurance schemes. Non-citizen groups have little room to protest their discrimination because they are outside the protection of national legal systems and often overtly persecuted, as they have been in cases of protracted conflict including in Iraq and Sudan.

Discrimination against these minorities is in violation of the 1992 Declaration on the Rights of Persons Belonging to National or Ethnic, Religious and Linguistic Minorities. In many cases, exclusion has been eased by emergency laws (which have been in place since 1963 in Syria), allowing governments to override remaining checks on discrimination.

**Trends in health and governance**

Overall, since 1970, health indicators in the Arab world have sharply improved with an average increase in life expectancy of 19 years—the largest gain among world regions, and an average reduction in infant mortality of 60 deaths per 1000 livebirths. In fact, five of the ten countries with the largest development gains since 1970 were Arab (Oman, Saudi Arabia, Tunisia, Algeria, Morocco). Since 1980, adult mortality has been declining across the region, except in Iraq (appendix p 3). These improvements have sometimes been attributed to government investment in social protection, and high levels of public sector employment, especially in countries of the Persian Gulf. However, mortality statistics capture only one aspect of health and wellbeing, and say little about quality of life, distress, and human security.

In the Arab world, the past two decades have been characterised by steady or worsening corruption and
reductions in political voice and accountability (appendix p 5). These deteriorating, or stagnantly poor, political conditions might explain the origins of some revolutions. Even though oil-rich countries of the Persian Gulf did well in assessments of the efficacy of their public administration, they did worst on public accountability (appendix p 5). Inequality can be a direct result of corruption, because resources and the benefits of economic growth are distributed to people who are supportive of the regime, sometimes at great expense to the public.

Additionally, poor governance has restricted economic growth in the Arab world. Poor governance can undermine investment, restrict job creation, and, most importantly, erode public trust and social fabric. In settings of poor governance, civil society and community networks are sometimes able to provide essential services, mitigating the effect of poor governance on health. Across the Arab world, formal and informal organisations and community-based groups have provided many additional forms of social protection (panel 2). Islamic political movements have captured the most scholarly, media, and policy attention. Organisations such as Hezbollah, Hamas, and the Muslim Brotherhood have sought to gain legitimacy through their efforts to provide or broker access to social welfare. But many other private stakeholders supply medical services, including both for-profit and not-for-profit providers and local and international organisations. However, in several authoritarian governments in the Arab world, activity of the informal sector and civil engagement is low, which has been attributed to the extent of government surveillance.

Although deteriorating health infrastructure and conditions cannot be causally linked to the impetus for the Arab uprisings, it is clear that health concerns feature prominently in the concerns of people dissatisfied with

Panel 2: Islamists and non-state providers in the Arab world

Outside of the high-income oil monarchies of the Persian Gulf, states have not been able to maintain functioning public health systems for their citizens. This has opened the door for the consolidation or increase in an array of non-state providers of basic health services. Private, for-profit providers constitute the largest component of the non-state sector, exacerbating health inequalities because the poor and low-to-middle classes often cannot afford treatment at their institutions. Both local and international non-governmental organisations (NGOs) are also active in the health sector, often but not exclusively operating at a very local level. Religious charitable organisations have the longest histories as providers of health services, dating back to at least the colonial period, and in some countries in the region remain important. Of all non-state providers, Islamists (both Sunni and Shia) have captured the most scholarly, policy, and media attention and are distinct from religious charities because they have explicit political aspirations alongside their religious and social goals. Islamists refer to organisations and movements that aim to build political power, often but not exclusively through participation in elections and other formal state institutions, and generally use non-violent means. In practice, however, the lines between Islamists and religious charities are often blurred as religious and social activism can be interpreted as political in their own right and because Islamists can have close informal relationships with religious charitable organisations or overlapping leaderships. Furthermore, it is worth noting that the designation as non-state is ambiguous because many Islamist organisations with associated charitable wings have contested elections and won posts in local and national government, a trend that has only increased since the Arab uprisings.

A snapshot of the range of the health institutions and programme activities of the Muslim Brotherhood in Egypt, its counterpart in Jordan, Hamas in occupied Palestinian territory, and Hezbollah in Lebanon shows the varied roles and weight of Islamists in distinct health system contexts. In Jordan, about 50 Islamic NGOs, which are mainly linked to the Muslim Brotherhood, were licensed. Some of these institutions have had many branches running schools, clinics, and hospitals. Despite the growth of these Islamic NGOs, the state is the major provider of health services in the country, whereas private, for-profit providers are increasingly important, particularly for high-income groups. In Egypt, the Muslim Brotherhood runs a network of clinics, schools, and vocational training centres that are often credited with winning support in the population. In practice, the network’s reach is restricted in a country with a population of 80 million people. Although it is difficult to obtain precise values on the organisation’s health institutions, according to a 2006 report, the Brotherhood ran about 22 hospitals and controls about 20% of all NGOs registered in Egypt, although some commentators suggest that the organisation’s importance in welfare provision is exaggerated. The state is the major provider for most citizens, although the declining quality of care in the public health system and the rise of for-profit providers since at least the 1980s has diminished its actual importance in health-care provision and financing. The role of Hamas in the health sector of the occupied Palestinian territory is even more difficult to quantify or even to classify, partly because the organisation actively tries not to publicise which health institutions it controls to avoid crackdowns by both Fatah (the political party that maintains control over the Palestinian National Authority in the occupied Palestinian territory) and Israel on its facilities. Furthermore, many perceived Hamas-run clinics and dispensaries might be run by supporters of the group, but have no formal affiliation with the organisation. A 2003 report by the International Crisis Group estimated that about 70–100 social welfare associations were affiliated with Hamas, excluding branch organisations. Hamas has always been more entrenched in the Gaza Strip, a trend that has increased since the Fatah–Hamas split in 2007. Even in Gaza,

(Continues on next page)
that the long-term effect of democracy or good governance (rather than year-on-year changes) leads to improvements in health outcomes.\(^6\) We also plotted these effects against mortality indicators (figure 3, figure 4). We noted that high government effectiveness seems to be associated with high average improvements in mortality indicators. Democracy seems to have no consistent relation with mortality improvements. This finding is consistent with recent scholarship suggesting that good governance strengthens the capacity of the state to deliver services.\(^7\) Although these trends do not establish a causal relation, they favour the argument that government effectiveness, not democracy, is associated with improvements in mortality. Because these findings are based on mortality statistics, these trends provide no information about the effect of autocracy and corruption on quality of life, including restrictions on freedom.

To probe how citizen perceptions of good governance might be associated with health, we used data from the 2010–11 Arab Barometer Survey (panel 1). Across the Arab world, most Arabs see their governments as corrupt, and citizens of those countries with worse corruption tended to have least confidence that governments were improving health services (appendix p 8). However, these perceptions of corruption and the perception that political leaders are not concerned with ordinary citizens do not seem to have a clear relation to changes in mortality.

**Informing the reform agenda**

Academic research is divided on whether it is democracy or effective government that leads to improved health.
We cannot be any more conclusive about the causal mechanisms between governance and health in the Arab world. Our analysis shows that in the Arab world, democracy and mortality improvements are not associated; however, there does seem to be an association—worthy of further investigation—between government effectiveness and mortality improvements.

In view of the concerns about the quality of the cross-country data for governance and electoral democracy, new regional data that show action and implementation, rather than perceptions of good governance, are needed. Additionally, data specific for marginalised groups are needed to consider the effect of political exclusion on welfare, which is an effect lost in aggregated population statistics. Finally, the pathways and mechanisms by which good governance leads to improved welfare remain contested in political science. The assessments possible with the existing data do not address questions of causality. Local qualitative studies assessing mechanisms of how political accountability might translate into improved mortality are greatly needed. Although the effects are likely to spread beyond the health sector, measures of health-care quality in the region would be valuable in this assessment.

Aggregate statistics for population health tell us little about the health status of the least advantaged residents of the Arab world. WHO relies on government reported information, the Arab Barometer Survey includes only citizens, and World Bank data for inequalities in the Arab world are sparse (panel 1), making an assessment of the determinants of health in marginalised groups elusive. A classic argument advanced by scholars working on social determinants of health is that low income, and high income inequality, are associated with poor health outcomes (eg, a reduction in life expectancy).28 In the Arab world, we are unable to assess the relation between income inequality and mortality because Arab countries do not reliably report income inequalities and the available data exclude the most vulnerable populations. Assessment of the health of these groups is an urgent priority for researchers.

In the absence of cross-country data, local studies have shown that health-care and social protection systems favour the urban middle class in many Arab countries, excluding poor people, migrants, and residents of rural areas.29 Despite high levels of government investment in social protection (between 20% and 25% of national income in Egypt and Jordan), social protection schemes in the region have been characterised by “regressive redistribution from the poor to the urban middle class”.30 Notably, people employed in the informal sector are largely excluded from social protection schemes. In an
analysis before the Arab uprisings, the informal sector employed 40–50% of north Africans (Algeria, Egypt, Morocco, Tunisia) and more than 20% of Syrians. We are unable to disaggregate mortality on the basis of inclusion in social protection, thus we cannot assess the effect of these exclusions on mortality.

Conflict and war threaten to create new intrastate inequalities and further compromise the use of aggregate statistics. Chronic and recurrent conflict has plagued Iraq, the occupied Palestinian territory, Lebanon, and Somalia. Recently, the Arab uprisings have given way to armed conflict in Libya, Syria, and Yemen. Furthermore, external stakeholders have placed economic sanctions, seeking to weaken the government in power in Iraq (under Saddam Hussein) and the occupied Palestinian territory (since the election of Hamas). In Iraq, these sanctions had a crippling effect on the health of the population, especially for children with infant mortality rising from 47 to 108 per 1000 under sanctions from 1994 to 1999, and under-5 mortality rising from 56 to 131 per 1000. However, in Iraq under sanctions, childhood mortality was determined by region, rather than wealth, because people living under UN sanctions saw sharp rises in child mortality, whereas in the autonomous northern region of Iraq childhood mortality declined. Similarly, in the occupied Palestinian territory, malnutrition has been determined geographically, by physical access to food, sometimes obstructed by road closures, rather than the financial means to purchase food. With the uprisings, new waves of migration are taking place to escape violence, and new regional disadvantages are being created, perhaps most urgently among Syrian refugees. A paper later in this Series explores the crucial health issues that emerge from violent conflict and wars in the Arab world.

Threats to health during the Arab uprisings

The Arab uprisings, while advocating for increased political accountability, economic opportunity, and equity, have had immediate detrimental effects on health in the region. The conflicts that have accompanied or followed uprisings in Syria, Egypt, Yemen, and Bahrain have led to increased social divisions, migration, political violence, and disruptions in education and health-care provision. These recent challenges come on top of the prolonged conflicts and insecurity in Iraq, Somalia, and the occupied Palestinian territory. Other countries, which have not had revolutionary movements, are under stress from the influx of refugees (especially Lebanon and Jordan with Syrian refugees), and thus might be deterred from advocating for reforms because of the instability and repression that has followed movements in other Arab countries. The Arab uprisings have escalated the level of conflict in the region, which has direct effects on the physical and psychological wellbeing of populations, the provision of medical resources, and the operation of medical staff. In Bahrain and Syria, for example, doctors caring for people affiliated with political oppositions have been targeted by the regimes and subjected to harassment and imprisonment. In Syria, hospitals have been taken over by the national army, and injured members of the opposition face arrest, and sometimes torture, if they seek medical care through formal channels. These breaches of medical neutrality, and the instability that accompanies political violence, are a threat to the provision of health care.

Conflict disrupts social inclusion, health-care access, and access to essential services. Social inclusion creates good social relationships and support networks, which increase people’s ability to cope with physical and mental illnesses. The increased vulnerability of minority groups (which had sometimes been protected by autocratic regimes) in the political upheavals is likely to further weaken their support communities. Existing social inequalities have also been amplified amid the uprisings. For example, the most high-income and elite populations have been able to travel to access medical services, whereas poor populations have found themselves increasingly competing for scarce resources, such as the case in Yemen and among Syrian refugees. Additionally, the instability after the uprising or migration to refugee camps is likely to have a negative effect on child nutrition and infant mortality, among other health indicators of these marginalised populations. The health effects of the Arab uprisings have neither been fully shown nor documented, and action by the humanitarian community and neighbouring governments will be guided by continual assessments.

The economic implications of the Arab uprisings might also affect population health. First, the strain on the economy, particularly in countries reliant on tourism, services, and export, has meant less available finance for health services on the part of the state. This situation is worsened by increased demand from citizens as populations become more vulnerable. Second, the economic crisis has meant a decrease in income and employment, which could lead to further reliance on compromised safety nets. Finally, economic hardship often pushes more people to work in the informal economy, where they do not have social security or access to health benefits.

Improving governance and health

For the first time in the history of the Arab nations, a movement has galvanised to demand freedom and increase political inclusiveness and accountability. However, the initial hope for reform across the region has, in many places, been replaced by violence, fear, or a hardening of the traditional status quo. What the future holds for the Arab world is unclear. The trends shown here, and the published literature, suggest that focusing on building effective and inclusive governments in the region could have public health benefits. This is a familiar concept; the Lancet Series on health in the
Dewachi and colleagues conclude that nations must be many of them based on international declarations promote accountability toward meeting these targets, regional epidemic of non-colleagues in arguing that Arab governments must not through accountability is reinforced by El held accountable to their citizens to avoid the organisations affiliated with the ruling authoritarian national stakeholders supporting civil society organisations in the Arab world have often supported arrangements. For example, Syria under Bashar al-Assad has been rife with cronyism, whereby those close to the regime largely owned and controlled the business sector. In Syria, before the 2011 uprising, a public–private partnership was proposed as a way to liberalise the health-care system, causing concern that this measure would make it difficult to enrol those working in the informal economy and other marginalised groups in medical insurance schemes—an issue already witnessed in neighbouring Lebanon. Often, these entrenched elite populations leading policy to deviate from the public interest have included health-care professions and their organisations.

International aid, military assistance, and oil purchases have supported many corrupt, ineffective, and non-inclusive governments across the Arab world. Additionally, international institutions, including the World Bank, have sometimes promoted policies that reinforce ineffective or irrelevant policies. International stakeholders supporting civil society organisations in the Arab world have often supported organisations affiliated with the ruling authoritarian regimes, thereby contributing to inequalities in political inclusion and restricting the effect of international capacity building efforts. Perhaps most crucially, international health and development organisations, including WHO and the World Bank, have been constrained by their reliance on these governments to collect information about health, inequality, and development in the region. Few countries in the region report any information about income inequality (available from authors on request) and about the state of their non-citizen populations. International health organisations should seek to measure the health of all people living in the Arab world, not only citizens.

To achieve better measures of health and ensure the delivery of health services when government services are weak, it is necessary for international stakeholders to liaise with civil society, activists, and, in some cases, political parties and revolutionary governments. This task is made particularly challenging because WHO has traditionally been constrained by its allegiance to working with governments, and many Arab states have penalised or criminalised international stakeholders working with NGOs. Foreign assistance, especially military assistance and cooperation, has also been crucial to the survival of authoritarian regimes in Egypt, Saudi Arabia, and Bahrain. In the USA, the Leahy Law requires that militaries receiving US assistance be deemed free of gross human rights abuses. US policy makers might be able to re-evaluate the nations they support that have used the military to suppress popular dissent, before military assistance and partnerships are renewed. Further, development assistance for health to the Arab world can provide medical relief and social protection for groups that are marginalised and excluded from access to government services.

The Arab uprisings have emphasised the demand for socioeconomic opportunity, equity, and freedom. At the same time, the instability that has accompanied or followed some of the Arab uprisings makes the poorest and most socially excluded people in society even more vulnerable. Efforts to increase the efficacy of governments and enhance political accountability can lead to reforms that expand and protect opportunities, health, and wellbeing across the Arab world. International stakeholders can provide support to measure the health of populations left outside the political process, the quality of health care, and the extent and nature of inequality in the region; all areas with sparse data. These measurements, done over time, can become a core part of operationalising accountability and informing the revolutions that have led to social reform and government upheaval. Additionally, the international community can support state and non-state stakeholders dedicated to improving the effectiveness of government and inclusion in the political process health, and should minimise support for stakeholders that have been complicit in the repression of freedom.
Series

Contributors
RB led the writing of the manuscript. IK contributed to writing the manuscript. MC wrote the panel on non-state providers and contributed to writing of the manuscript. JS managed the database and produced the graphs. SB wrote the panel on statistical methods (appendix) and guided the analysis. AJ provided the Arab Barometer data and gave input on the manuscript. PW and RG contributed to the writing, editing, and guiding of the manuscript throughout this project.

Conflicts of interest
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Health in the Arab world: a view from within 2

Non-communicable diseases in the Arab world

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

Introduction

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

Internationally, action against non-communicable diseases is gaining momentum, most notably with the political declaration of the UN General Assembly on the prevention and control of non-communicable diseases in 2011, and the subsequent monitoring framework.8–10 Cost-effective and evidence-based prevention and treatment measures to address non-communicable diseases—called best buys by WHO—have been identified.11–14 Arab governments need to engage with this international momentum and should be held accountable for their management of the non-communicable disease crisis, which threatens to derail an already fragile social and economic development trajectory. The response of Arab countries to the crisis has so far been inadequate. The gap between epidemiological burden and policy response is surprising, given that a Global Burden of Disease Study, published in 1997, identified non-communicable diseases—notably cardiovascular disorders—as the leading causes of deaths in the Middle Eastern crescent (which included north Africa, the Middle East, Pakistan, and the central Asian republics of the former Soviet Union).15 Subsequent evidence suggested that the greatest increase in non-communicable disease mortality rate between 2006 and 2015 was expected in Africa (27%) and the eastern Mediterranean region (25%), which includes most Arab countries.16 The discrepancy between epidemiological data and policy response is partly caused by the weaknesses in the public systems (of which health systems are a part) and in the complex political, social, and economic environments in which these public systems operate.17 Poverty, conflict, sex inequality,
corruption, and lack of accountability have affected health in the Arab world to varying degrees, and Arab countries have substantial variation in the availability of resources for spending on health.16–17

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

**Mortality, morbidity, and disability burden**

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

In 2008, more than 1·2 million people in the Arab world died from non-communicable diseases, accounting for nearly 60% of all deaths in the region, with wide variations between countries (ranging from 27% in Somalia to about 84% in Oman and Lebanon).19 More than 34% of deaths from non-communicable disease related were in individuals younger than 60 years. We obtained data for age-standardised death rates (per 100000) for non-communicable diseases in Arab

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**Figure 1: Death ranks for top ten causes in the Arab world, 1990 to 2010**

Top ten causes of death and mean rank for low-income (A), middle-income (B), and high-income (C) Arab countries. Low-income Arab countries are Comoros, Djibouti, Mauritania, Yemen, and Somalia; middle-income Arab countries are Algeria, Egypt, Iraq, Jordan, Lebanon, Libya, Morocco, occupied Palestinian territory, Sudan, Syria, and Tunisia; and high-income countries are Bahrain, Saudi Arabia, Kuwait, Oman, Qatar, and the United Arab Emirates. Data are from Mokdad and colleagues.7
countries from Mokdad and colleagues’ analysis of GBD data, and grouped them according to level of income (figure 2). This figure shows a higher burden of non-communicable diseases in middle-income countries undergoing economic development than in high-income countries.

**Modifiable risk factors**

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

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

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

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

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

The 2008 age-standardised prevalence rates of overweight and obesity in adults aged 20 years or older in Arab countries are alarmingly high (table). The prevalence of overweight is highest in high-income countries, but very high levels are also reported in some middle-income countries (table). In all countries, the prevalence of obesity was higher in women than in men (table). Using a population-based dataset of 199 countries between 1980 and 2008, Danaei and colleagues showed that mean BMI increased for Arab men and women. In women, mean BMI increased per decade in high-income countries (by 1.29 kg/m² in Bahrain and 1.18 kg/m² in Saudi Arabia) and middle-income countries (by 1.67 kg/m² in Egypt and 1.38 kg/m² in the occupied Palestinian territory).

The global obesity epidemic is not restricted to the adult population; it has also emerged as a public health concern in children and adolescents. Orsi and colleagues reported data from the National Health and Nutrition Examination Survey (NHANES), the Pediatric Nutrition Surveillance System (PedsNSS), and the National Center for Health Statistics (NSCH), showing high overweight and obesity rates in young children (ages studied ranged from 1 to 5 years), school-aged children (aged 6–11 years), and adolescents (age range 10–19 years). This increase is of particular concern.

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

Arab countries have been grouped according to income level. Data are from Mokdad and colleagues. NCD = non-communicable disease.
because paediatric obesity has been shown to continue into adulthood and to predict a broad range of adverse health effects such as hypertension, type 2 diabetes, and insulin resistance later in life (panel; figure 4).49–50 The prevalences of overweight and obesity have increased in both young and adult populations of GCC countries, including Kuwait, Qatar, Saudi Arabia, and Bahrain, where 66–75% of the adult population (aged >18 years) and 23–40% of children and adolescents (<18 years) are estimated to be overweight and obese.51

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

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

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

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

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

In the next section, we apply elements of the stepwise approach proposed by Bonita and colleagues18 to the
situation in Arab countries, with emphasis on its specific challenges and limitations. We will also make recommendations for priority actions.

Planning

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

Although non-communicable diseases will be treated in the health sector, prevention efforts need to extend well beyond this sector to include the education, agriculture, transport, urban planning, and finance sectors. In the Arab world, weak public institutions, and inadequate governmental oversight and regulation of key organisations that affect public health, are unlikely to lead to effective intersectoral collaboration or to successful collaboration with private sector and special interest groups (such as the food, hospitality, or tobacco industry). Without the cooperation of these sectors, the structural and environmental factors that contribute to non-communicable diseases will persist (eg, unaffordable fresh fruits and vegetables, packaged foods with high trans-fat and salt contents, uncontrolled advertising that targets young people) and thereby negatively affect behavioural risk factors.

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

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

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

Implementation

Reorientation and strengthening of health systems

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

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

In terms of health expenditure, most investments are made in tertiary-care-oriented services rather than public health services and prevention. Data for the proportion of total health expenditure that goes to public health and preventive activities are very difficult to obtain, especially when most Arab countries do not have national health accounts. The Global Health Expenditure Database66 contains data for public health expenditures for less than half the Arab countries, and in some cases, the estimates are a decade old. Nevertheless, available estimates range from a low of 1% (Lebanon, 2004) to a high of 10% (Egypt, 2002). Expenditure on non-communicable diseases is

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

Recently, attention has been directed towards a developmental rather than a degenerative hypothesis linking maternal diet and inadequate nutrition in early life to endocrine, physiological, and metabolic adaptations that might increase sensitivity to the lifestyle-related risk factors leading to obesity and other non-communicable diseases later in life.34–36 Evidence is accumulating that metabolic events during the crucial periods of prenatal and postnatal development have substantial modulating effects on adult health.37 Such lifelong programming events are regulated by undernutrition and stunting in early life followed by rapid weight gain during late childhood and adolescence, and by faulty early feeding practices that seem to constitute an epigenetic basis for common non-communicable diseases. A combination of factors have probably contributed to the increasing prevalence of non-communicable diseases reported in countries of the Arab world,38 for which available studies have documented a high prevalence of obesity in children younger than 5 years, inadequate maternal and infant feeding practices, and faulty growth patterns, which warrant thorough investigation.39

Although few data exist for the association between dietary patterns and disease in the Arab world, the implication of these trends for adult health is still questioned. A study of Lebanese adults (aged >18 years) has related a diet of fast food and dessert with metabolic syndrome and hyperglycaemia,40 whereas a national study of Lebanese adults (aged 20–55 years) has reported an association between this type of diet and higher body-mass index.41 Additionally, reports from the region have suggested that children younger than 5 years have less than optimal growth patterns and dietary practices. A review by Khanna and colleagues42 shows that, in countries undergoing a nutrition transition, fetal growth failure followed by excessive weight gain increases the exposure to risk factors for later-onset chronic diseases.

Although undernutrition is the biggest contributor to child mortality in the eastern Mediterranean region—with 15% of the global burden among newborn babies and young children occurring in this region43—some countries have a double burden of malnutrition, with the coexistence of child stunting and overweight in children younger than 5 years. Although research on undernutrition and overnutrition in the Arab world is scarce, available figures show that the region has similar malnutrition indicators—stunting (28%), underweight (11%), and wasting (9%)—to those reported in children younger than 5 years in other developing countries.44 However, available data45–47 suggest that rates of overweight and obesity in children younger than 5 years are similar to rates reported in developed countries (11%), including those in Europe and North America, and Japan.48 Prevalence of obesity in children younger than 5 years in Arab countries ranges between 6.5% and 9.9%, which is similar to rates documented in the USA (10.4%).49 This high prevalence of obesity in young children is worrying, because this trend is known to continue into adulthood, thereby increasing risk for later-onset chronic diseases.

The pre–post natal period has been referred to as a crucial window of opportunity for interventions to curb the growing epidemic of chronic non-communicable diseases.41 The importance of inadequate early feeding patterns and dietary practices at this crucial phase in life calls for early-life nutrition to be a strategic priority at the core of national agendas.
also adversely affected in Arab countries that depend heavily on international aid, such as the occupied Palestinian territory, where non-communicable diseases became a priority target only recently.67

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

Several actions are needed to reorient services to non-communicable diseases.44 The chronic nature of non-communicable diseases requires a team approach—necessitating an increase in the number, composition, and skills of primary health-care professionals besides physicians—that includes nurses, laboratory technicians, and health educators. Curriculum development and in-service training are needed for primary-care physicians to assess risk factors and implement early and appropriate prevention interventions using evidence-based guidelines for risk assessment and management. In addition to the appropriate training of health workers, close follow-up and supportive supervision are essential to ensure quality and consistency of care. Although several countries in the region are trying to adopt the family-practice model, there is a shortage of adequately trained family physicians who can deliver preventive care and effective treatment at the primary-care level.45

With the appropriately qualified and trained workforce, frequently used health services can be used to provide selected interventions for non-communicable diseases as well.46 For example, most countries in the region have well established maternal and child health services in which prevention and management of non-communicable diseases can be integrated. Such integration might result in synergy, not only in service delivery, but also in monitoring and assessment, community engagement, and mobilisation, which could save costs.49 Indeed, maternal and child nutrition services are an example of an intervention that can have long-term effects on the incidence of cardiovascular and other non-communicable diseases in later life.

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

In view of the diversity in resources and in organisation of health services across the Arab world, the scope of interventions needs to be put into context, ranging from interventions targeting individuals at highest risk to those directed at primary prevention.49

Delivery of best buys to address the crisis

Best buys are proposed as a core set of non-communicable-disease interventions for national scale-up and as a starting point for work towards universal coverage.60 On the basis of country situations, resources, and capacity, which vary greatly in the Arab world, other interventions need to be added and implementation and coverage need to be gradually expanded using a primary health-care approach. Although a comprehensive set of non-communicable-disease interventions could be implemented in high-income countries in the region, feasibility in low-income and middle-income countries will depend on the level of health-care spending, competing health priorities, and capacity of the health system.

Factors specific to each country need to be considered—e.g., human resources are a central component of any non-communicable disease strategy and can greatly affect the possibility of sustained improvements in the health sector. In most of the wealthy Gulf

Figure 4: Prevalence of stunting and obesity in young children in selected countries of the Arab world

(A) Proportion of children younger than 5 years with stunting in Arab countries for which data were available. Data for Kuwait, Lebanon, Libya, Morocco, Qatar, Saudi Arabia, Sudan, and Yemen are from a 2009 UNICEF report on tracking progress on child and maternal nutrition;40 data for Egypt, Iraq, Jordan, Oman, Tunisia, and Syria are from a 2012 UNICEF report on the state of the world’s children.47 (B) Proportion of young children who are obese in Arab countries for which data were available, and in the USA (for comparison); data are from various sources.55-60
Cooperation Council countries, reliance on the transient expatriate population is not conducive to the development of sustainable long-term skills in the health sector (and others), nor to the transfer of knowledge and experience. Therefore, any national strategy should include the gradual development of national capacity.16

Another important factor for some countries in the Arab world is conflict—from drawn-out occupation in the occupied Palestinian territory to the unstable aftermath of the invasion of Iraq and the current revolution in Syria. Such factors affect the availability of a health workforce and the capability of health systems to function.13 They also restrict a country’s ability to apply the measures needed for effective prevention of non-communicable diseases, such as control over imports (eg, of healthy food) and taxation (eg, of tobacco products), and control of the increase in risk behaviours as a result of high levels of psychological distress.

**Actions to address tobacco consumption**

The WHO Framework Convention on Tobacco Control has been signed or ratified by most Arab countries,76 but tobacco use in the region has been increasing. WHO’s global tobacco report7 shows that Arab countries still lag behind other countries with respect to policies for tobacco control. Policies for promotion of smoke-free environments, labelling of products, and taxation are particularly scarce (appendix).

Implementation of tobacco control measures has challenges. First, effective tobacco control mechanisms fall largely outside the health sector. The implementation of smoke-free environment legislation, for example, might be under the authority of the Ministry of Interior, and taxation of cigarettes might be the remit of trade rather than health authorities. Second, control measures are subject to complex interactions between political and economic forces and to the strategies used by transnational tobacco companies.8 Examples of industry tactics that have been used in the region include targeting of young people, circumvention of existing laws, dissemination of misinformation, lobbying of government officials, and even smuggling of tobacco products to closed markets.8

Although important tobacco-control initiatives have been implemented in some Arab countries—eg, pictorial warnings22 and smoke-free spaces and to a lesser extent cigarette taxation—genuine political commitment to full implementation of the MPOWER measures3 to reduce the demand for tobacco is needed (appendix). Reduction in tobacco demand also requires systematic and effective health education campaigns, and counselling and cessation support services that can be provided at the primary-care level.

Fortunately, anti-tobacco coalitions formed in Lebanon and the occupied Palestinian territory have been successful in bringing together academics, non-governmental organisations, media, and health professionals. In Lebanon, the efforts of this broad-based coalition were instrumental in passing the tobacco control law. Involvement of civil society will be important in anti-tobacco efforts in Arab countries.

**Actions to address unhealthy diets**

National policies, programmes, and action plans to improve diet and increase physical activity are undeniably important for non-communicable-disease prevention, but little is known about their scope and content in the Arab world (appendix). More importantly, the realities of implementation are likely to be very different from the written policies. Results of a review of diet and physical activity policies in low-income and middle-income countries showed that availability of policy documents was particularly low for the eastern Mediterranean region.77 Of the countries in the region, only Jordan had a policy that addressed all four risk factors: salt, fat, fruits and vegetables, and physical activity. In particular, the review reported that diet and physical activity policies tended not to be associated with specific action plans, timelines, and budgets, and they were also mostly focused on individual behavioural changes, with little involvement of the private sector.74 Policies that link to specific budgets and priority actions, and involve a broader range of stakeholders, are needed. Importantly, pricing regulations are needed to ensure that fruits and vegetables are more affordable than processed foods, thus targeting both obesity and micronutrient deficiencies.75

Evidence from the large-scale INTERSALT study (which does not include any Arab countries) shows that population-wide decreases in salt intake will reduce the risk of coronary and stroke deaths.23 Even slight reductions in salt intake will result in substantial reductions in medical costs and cardiovascular events.76 Reduction in salt intake can be achieved with behaviour modification efforts (through advertising and health education campaigns) and reformulation of food products by industry.26 In the Arab world, bread is a big source of salt in the diet, and should be the first target for reformulation by gradual reduction. Studies on salt consumption are a priority in the region, with the aim to reduce salt consumption by 30% by 2025.75 Surveillance of sodium intake requires 24 h urinary studies, none of which are being done in any Arab country.

In high-income and middle-income countries, reduction of trans-fat consumption has been addressed through mandatory labelling of the trans-fat content in foods and voluntary agreements with the food industry.27 Little information about trans-fat intake in the Arab world is available. A recent study in Jordan showed a high and variable content of trans fat in both locally produced and imported foods.28 The WHO Regional Office for the Eastern Mediterranean has proposed various policies to reduce trans-fat intake, including...
further studies on trans fat with respect to labelling, pricing regulations, and import restrictions. Health education campaigns are needed to educate consumers about trans fats.

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

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

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

**Accountability**

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

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

**Strong political commitment**
Political commitment at the highest national levels is crucial for the implementation of the phased response to the non-communicable-disease crisis in the Arab world. Governments should be held accountable for compliance with international frameworks through monitoring and reporting, not only of risk factors and non-communicable-disease morbidity and mortality, but also of implementation of multisectoral policies and effective interventions and the provision of adequate financial and regulatory support.

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

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

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

**Cost of inaction**
With one of the youngest populations in the world, the Arab region stands to reap the economic benefits of the demographic dividend, provided that the appropriate educational and labour policies and investments are put
in place. However, the human and economic burden of non-communicable diseases might well derail this prospect. In addition to necessitating increased health and social welfare spending, non-communicable diseases also lower the labour supply and labour outputs. An analysis of the economic burden of non-communicable diseases in Egypt, for example, showed that people who reported having non-communicable diseases worked fewer hours (an average of 22 hours per week), which reduced the aggregate labour supply to 19% below its potential, leading to an estimated overall 12% loss in the country’s gross domestic product. Such analyses emphasise the need to tackle the rise in non-communicable diseases in the Arab world as a development imperative. Going forward, Arab countries should engage with the enormous amount of international activity that is now happening to reduce the prevalence of non-communicable diseases, especially as the Millennium Development Goals will come to an end in 2015. Experience, in the Arab world and elsewhere, has shown that clear targets increase accountability, which is much needed.

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

Conflicts of interest
We declare that we have no conflicts of interest.

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83 Participants in the International Conference on Healthy Lifestyles and Noncommunicable Diseases (NCDs) in the Arab World and the Middle East. The Riyadh Declaration, Sept 12, 2012. International Conference on Healthy Lifestyles and Noncommunicable Diseases in the Arab World and the Middle East; Riyadh, Saudi Arabia; Sept 10–12, 2012.


Health in the Arab world: a view from within 3

The path towards universal health coverage in the Arab uprising countries Tunisia, Egypt, Libya, and Yemen

Shadi S Saleh, Mohamad S Alameddine, Nabil M Natafgi, Awad Matania, Belgacem Sabri, Jamal Nasher, Moez Zeiton, Shaimaa Ahmad, Sameen Siddiqi

The constitutions of many countries in the Arab world clearly highlight the role of governments in guaranteeing provision of health care as a right for all citizens. However, citizens still have inequitable health-care systems. One component of such inequity relates to restricted financial access to health-care services. The recent uprisings in the Arab world, commonly referred to as the Arab spring, created a sociopolitical momentum that should be used to achieve universal health coverage (UHC). At present, many countries of the Arab spring are considering health coverage as a priority in dialogues for new constitutions and national policy agendas. UHC is also the focus of advocacy campaigns of a number of non-governmental organisations and media outlets. As part of the health in the Arab world Series in The Lancet, this report has three overarching objectives. First, we present selected experiences of other countries that had similar social and political changes, and how these events affected their path towards UHC. Second, we present a brief overview of the development of health-care systems in the Arab world with regard to health-care coverage and financing, with a focus on Egypt, Libya, Tunisia, and Yemen. Third, we aim to integrate historical lessons with present contexts in a roadmap for action that addresses the challenges and opportunities for progression towards UHC.

Introduction

Attainment of the best possible health is a human right, and is part of WHO’s constitution. Additionally, the constitutions of many countries in the Arab world show the role of government in guaranteeing provision of health as a right for all citizens. However, many countries have inequitable health-care systems, contributing to the poor wellbeing of their citizens. A component of such inequity is restricted financial access to health-care services, as manifested by fairly high levels of out-of-pocket spending on health care. This inequity is further shown by the millions of people, especially those in low-income and middle-income countries, who face catastrophic spending or fall into poverty after sickness.

Many reasons have been suggested for the recent uprisings in the Arab world (often referred to as the Arab spring or Arab uprisings), including high unemployment, corruption, major abuses of human rights, and—most importantly with regard to progression towards universal health coverage (UHC)—lack of equitable social provision.

In this report in the Series, we focus on four countries in the Arab world that have had uprisings: Egypt, Libya, Tunisia, and Yemen (figure 1). Although uprisings are also occurring in other countries in the region at the time of writing, these four were selected for two main reasons. First, all had new governments instituted, albeit with varying functional structures because of the nature of the transitional phase. Second, the four countries represent the diversity of the region with regard to wealth, health-system characteristics (eg, financial protection portfolios), and social context (tables 1, 2), yet share the common theme of longstanding regimes that contributed to inequity (appendix). The sociopolitical contexts of these four countries, perhaps because of the early stage of their revolutions, are far from stabilising. For example, large public demonstrations in the summer of 2013 in Egypt against its elected President Mohammad Morsi were followed by a military intervention that overthrew Morsi and instituted a transitional government. We argue that, despite the obvious dynamism in the contexts of these four countries, the Arab uprisings still present an important sociopolitical enabler for progression towards UHC. We base this argument on the premise that revolutions in recent history—mostly after World War 1—although varying widely in terms of genesis, duration, and motivating ideology, have often embraced major changes in economic policies and governmental role in the provision of social programmes, including those related to health care. An essential enabler for the successful integration of more equitable and comprehensive health policies is the early endorsement of a clear roadmap for progression towards UHC as health-care systems are modernised, restructured, or re-engineered.
In this Series paper we have three complementary objectives. First, we aim to present selected historical experiences of countries that had substantial social and political changes, and how these changes affected their path towards UHC. Second, we present a brief historical overview of three distinctive phases in the development of health-care systems (specifically financing) in four countries of the Arab spring, from political independence (early and mid-20th century) until the onset of uprisings in 2011, with a focus on the sociopolitical factors that shaped this development. Lastly, we aim to integrate historical lessons with present contexts into a roadmap for action that addresses the challenges and opportunities for progression towards UHC. To address these objectives, enhance methodological rigour, and increase the validity of reported analyses and conclusions, we use a combination of a review of literature about historical experiences of countries that underwent substantial social and political changes and how these affected the path towards UHC, and an assessment of the structure, processes, and outcomes (or indicators) of the health-care systems in the four countries. This analysis is supplemented by expert

### Table 1: Selected key socioeconomic and health indicators for Egypt, Tunisia, Libya, and Yemen

<table>
<thead>
<tr>
<th>Year</th>
<th>Yemen</th>
<th>Egypt</th>
<th>Tunisia</th>
<th>Libya</th>
<th>Yemen</th>
<th>Egypt</th>
<th>Tunisia</th>
<th>Libya</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>18 537</td>
<td>65 420</td>
<td>9 729</td>
<td>5 328</td>
<td>22 879</td>
<td>78 728</td>
<td>10 459</td>
<td>5 603</td>
</tr>
<tr>
<td>GDP per capita (US$)</td>
<td>465</td>
<td>1258</td>
<td>2160</td>
<td>6072</td>
<td>1137</td>
<td>2257</td>
<td>3852</td>
<td>10 722</td>
</tr>
<tr>
<td>Population younger than 15 years</td>
<td>47.7%</td>
<td>37.7%</td>
<td>31.0%</td>
<td>39.0%</td>
<td>45.0%</td>
<td>31.7%</td>
<td>24.2%</td>
<td>31.1%</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>12%</td>
<td>13%</td>
<td>16%</td>
<td>11%</td>
<td>16%</td>
<td>9%</td>
<td>13%</td>
<td>1%</td>
</tr>
<tr>
<td>Literacy rate in people aged 15 years and older</td>
<td>47%</td>
<td>61%</td>
<td>67%</td>
<td>82%</td>
<td>62%*</td>
<td>71%</td>
<td>78%</td>
<td>89%</td>
</tr>
<tr>
<td>Gross primary school enrolment ratio†</td>
<td>59%</td>
<td>95%</td>
<td>99%</td>
<td>106%</td>
<td>75%</td>
<td>94%</td>
<td>98%</td>
<td>97%</td>
</tr>
<tr>
<td>Gross secondary school enrolment ratio total‡</td>
<td>35%</td>
<td>82%</td>
<td>65%</td>
<td>97%</td>
<td>37%</td>
<td>92%</td>
<td>75%</td>
<td>1%</td>
</tr>
<tr>
<td>Poverty headcount ratio at national poverty line (% of population)*</td>
<td>20.1</td>
<td>16.7</td>
<td>32.4</td>
<td>-</td>
<td>34.8</td>
<td>22</td>
<td>3.8</td>
<td>-</td>
</tr>
<tr>
<td>Gini index (rank):</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>37.7 (71)</td>
<td>30.8 (20)</td>
<td>41.4 (98)</td>
<td>-</td>
</tr>
</tbody>
</table>

### Table 2: Selected key socioeconomic and health indicators for Egypt, Tunisia, Libya, and Yemen

<table>
<thead>
<tr>
<th>Year</th>
<th>Yemen</th>
<th>Egypt</th>
<th>Tunisia</th>
<th>Libya</th>
<th>Yemen</th>
<th>Egypt</th>
<th>Tunisia</th>
<th>Libya</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>61.1</td>
<td>69.3</td>
<td>71.9</td>
<td>69.5</td>
<td>61.1</td>
<td>73.2</td>
<td>74.5</td>
<td>72.3</td>
</tr>
<tr>
<td>Infant mortality rate (per 1000 livebirths)</td>
<td>67.4</td>
<td>25.5</td>
<td>20.0</td>
<td>24.4</td>
<td>68.5</td>
<td>16.5</td>
<td>17.3</td>
<td>14.0</td>
</tr>
<tr>
<td>Maternal mortality ratio (per 100 000 livebirths)§</td>
<td>383</td>
<td>74</td>
<td>56</td>
<td>63</td>
<td>269</td>
<td>43</td>
<td>36</td>
<td>40</td>
</tr>
</tbody>
</table>

Data from the WHO Regional Office for the Eastern Mediterranean,6,7 unless otherwise stated. GDP=gross domestic product. *Data from the World Bank. †Gross primary and secondary school enrolment ratios measure the proportion of children enrolled in primary or secondary education (respectively), regardless of age; these measures can exceed 100% because of the counting of overaged and underaged students. ‡Gini index9 represents the score for the most recent year released by the World Bank; ranking based on ascending order of Gini index. §Data from Hogan and colleagues.10

### Table 2: Selected key indicators for health expenditure for Egypt, Tunisia, Libya, and Yemen

<table>
<thead>
<tr>
<th>Year</th>
<th>Yemen</th>
<th>Egypt</th>
<th>Tunisia</th>
<th>Libya</th>
<th>Yemen</th>
<th>Egypt</th>
<th>Tunisia</th>
<th>Libya</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>15.3</td>
<td>65.9</td>
<td>115.0</td>
<td>344.0</td>
<td>64</td>
<td>113</td>
<td>240</td>
<td>417</td>
</tr>
<tr>
<td>Total expenditure on health as a proportion of GDP</td>
<td>5.6</td>
<td>13.9</td>
<td>47.0</td>
<td>216.0</td>
<td>18</td>
<td>47</td>
<td>130</td>
<td>276</td>
</tr>
<tr>
<td>Government expenditure on health as a proportion of total health expenditure</td>
<td>3.9%</td>
<td>4.8%</td>
<td>5.3%</td>
<td>3.9%</td>
<td>5.6%</td>
<td>5.0%</td>
<td>6.2%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Out-of-pocket expenditure on health as a proportion of total health expenditure</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>71.0</td>
<td>57.0</td>
<td>40.0</td>
<td>33.9</td>
</tr>
<tr>
<td>Government expenditure on health as a proportion of total government expenditure</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4.3%</td>
<td>5.9%</td>
<td>10.4%</td>
<td>5.5%</td>
</tr>
</tbody>
</table>

Data from the WHO Regional Office for the Eastern Mediterranean.11 GDP=gross domestic product.
opinions from key stakeholders in the health systems of each of the four countries and from regional health systems. The roadmap towards UHC combines an analytical synthesis of literature with the contextualised opinion of health-system stakeholders.

**Historical examples of sociopolitical transformations and developments in health-care systems**

The transformation of health-care systems from inequality to equality has been argued to be a natural outcome (or an underlying predecessor) of political transformations driven by social-equity agendas (figure 2). This dynamic between social equity and UHC was described in the 2008 WHO World Health Report, which explicitly stated that “demand from the communities that bear the burden of existing inequities and other concerned groups in civil society are among the most powerful motors driving universal health coverage reforms”. Evidence from the scientific literature further substantiates this argument by suggesting that revolutions driven by such an agenda form a solid path to a more equitable and healthier society.

For example, several movements in European countries placed pressure on political leadership to move forward with health-system reform. Germany is often thought of as the source of social health insurance because it was the first European country to enact mandatory state-supervised legislation, in the Bismarck era of the late 19th century, in an attempt to contain social unrest in German workers during the industrial revolution. Likewise, in postwar France, strike waves and mass demonstrations shaped sociopolitical changes and substantially affected the development of social benefits. The German and French scenarios also hold true for reforms after World War 2 in several western European countries.

Latin America provides additional examples of progress towards UHC resulting from governments’ response to organised demands for public health policies. The demands for public health were a main pillar of opposition movements to military dictatorships in countries such as Argentina, Brazil, and Chile. For example, the health for all vision in Brazil emerged during the years of political opposition and at the end of the military dictatorship that started in 1964. The reform of the Brazilian health sector, at the same time as democratisation, was driven by civil society rather than by governments, political parties, or international organisations. Furthermore, the Cuban revolution was linked with the nation’s health-care system. In fact, Cuba remained faithful to the basic premises of its system and has been praised by many for social equity and health outcomes. After the 1959 revolution, Cuba succeeded in attaining considerable advances for many health outcomes.

The Middle East is not an exception to this trend of sociopolitical transformations associated with notable reforms of health-care systems. For instance, the Turkish military coup of 1960 was an important turning point in Turkey’s history, paving the way for major reconstruction of the constitution of the republic. This major event was complemented with substantial developments in Turkish health care with the introduction of the Law on the Nationalization of Health Care Delivery (Law Number 224).
and the Law on Population Planning (Law Number 554). These laws acknowledged that health-care services should be delivered equitably, continuously, and in accordance with the population’s priorities. They were soon followed by an attempt to establish a national health service with the endorsement of the 1961 Law on the Nationalization of Health Care Delivery, with a vision to provide free (or partly free) health care subsidised by contributions from citizens and allocations from the government budget (tax revenue). In 2003, the Turkish health-care system underwent its most profound change with the implementation of the Health Transformation Program. As part of the Health Transformation Program, the Social Security Institution became the sole payer of health care, and in case of deficits, with contributions from employers, employees, and the government. Health policy and health-care coverage was one of the main platforms that propelled the present Turkish Government, led by the Justice and Development party, into power in two consecutive elections (2007 and 2011). The Health Transformation Program showed favourable health outcomes for the population since its inception.

Although many of the substantial health-care reforms were products of major sociopolitical changes, some systems underwent reforms as a result of social pressure and political will and vision. For instance, Mexico achieved UHC by establishing the System of Social Protection in Health to provide coverage for its 11 million uninsured families by 2010. The political pillar of the reform for the Mexican health-care system was wide public participation and involvement of empowered citizens, in addition to a government administration with a will for reform. Such a model was also observed in southeast Asia, where governing sought to implement health-system reforms backed by social support for UHC implementation. However, these global examples of sociopolitical transformations and associated health-system transformations did not occur in many countries in the Arab world that underwent similar sociopolitical changes in the 20th century.

Economic and political context of health-care system evolution
An interrupted path towards UHC

The four countries examined in this report have diverse political, economic, and health profiles (tables 1, 2), but share a similar chronological and contextual pattern of change and development of their health-care systems. Evolution in health-care systems is strongly affected by social, political, and economic factors that shape government public policy, including that for health care.

The Arab world endured centuries of non-self-governance that started with the rule of the Ottoman Empire and was followed by that of European colonial powers (ie, France, Italy, Spain, and the UK) after World War I. A strong movement for Arab independence started to emerge in the late 19th and early 20th centuries, initially supported by western powers to undermine the hold of the Ottoman Empire on the Arab world. This movement eventually resulted in most Arab countries gaining independence from colonialism in the mid-20th century (appendix).

Phase 1: health-care systems in the era of post-monarchy socialism

The modern political history of Egypt, Libya, Tunisia, and Yemen, as for most countries in the Arab world, can be traced back to the 1950s and 1960s when ruling monarchies were toppled by military coups in most countries. The resulting states were labelled republics, with mostly military leaders assuming power. Pan-Arab nationalism gained popularity, especially with the leadership of Gamal Abdul Nasser of Egypt and his active attempts to achieve Arab unity. During that period, the ramifications of the Cold War resulted in both the east camp (led by the Soviet Union) and the west camp (led by the USA) manoeuvring for strategic alliances with countries and regions around the world. Partly affected by the appeal of socialism (a basis for the revolutions against monarchies), several Arab countries sided with the east camp. As a result, strong economic, political, and military ties were established between the Soviet Union and Egypt, Yemen (before and after its unification), and Libya, along with other countries in the Arab world. In Tunisia, socialism was even more pronounced, because the ruling party in the post-revolution era until the late 1980s was the Socialist Destourian Party.

Socioeconomic development in the Arab world, including that in the health sector, during this era was mostly led by the state. The socialist approach of the ruling regimes and parties was translated into movement towards a welfare state, with health care as an integral component. All four countries legislated for free access to health care in their new constitutions. The notion of free access to health care needed the development of new state financing structures, or absorbing of existing private systems into the public sector. The health-care systems of the four countries, as for others in the Arab world, resulted from a merging of the functions of financing, delivery, and organisation of health services under state control. However, although the evolution into welfare states provided many citizens with free access to health and other social services, serious concerns were expressed with regard to the financial sustainability of the free health-care policy. Financing of health services by the social security systems led to budget deficits in several instances, and resulted in many health-care facilities lacking necessary supplies and medications. Additionally, physicians and other providers in countries such as Yemen and Egypt were poorly paid, which created demotivation and ultimately contributed to poor care in public facilities. Another issue was concerns with the overuse of health services because of free access policies. Of the four countries, Yemen was perhaps the most disadvantaged
deterioration in the social services infrastructure, placing the country at the bottom of the human development ranking among all other Arab countries.62–64

Phase 2: the era of privatisation and cost recovery
In the late 1980s, as a result of challenges in sustaining of financing and quality of services for free access to health care, the governments of Egypt, Libya, Tunisia, and Yemen looked for alternative ways to supplement the public financing of health. This period coincided with an increased interest of international funding agencies, mostly the World Bank and the International Monetary Fund, in expanding of their investment portfolios into social development projects. This shift for investment beyond classic projects for economic growth (eg, transportation and energy) was encouraged by development theories that by the 1980s advocated the importance of meeting individuals’ basic needs (eg, health, nutrition, and education).59–61 The shift was accompanied by an emphasis on issues such as privatisation and role reduction of the public sector, as per the Washington Consensus.52,63 This consensus emphasised macroeconomic stability and integration with the international economy, with fundamental elements including: public expenditure priorities, tax reform, financial and trade liberalisation, increased foreign investment, privatisation, and a reduced role of the state.62 In 1987, the World Bank promoted a report that called for the introduction of user fees (ie, payment contributed by patients at the point of care) as a main component of cost-recovery schemes and a solution for deficits in public health budgets,64 although the World Bank later reversed its position on user fees.

As a result, reduced public spending in social sectors resulted in major deficits in health—including lack of drugs and competent professionals. These deficits contributed to patients seeking private care, leading to what is referred to as passive privatisation. Additionally, governments engaged in active privatisation policies, including outsourcing of some clinical and non-clinical services to private providers and investors in medical industry. New liberal reforms were accompanied by some political reforms aimed at reduction of the government’s role in economic development and weakening of planning functions. The World Trade Organization pressured countries to accelerate free trade in goods and services and to encourage private investment in medical industries, including in pharmaceutical and medical equipment companies.

As part of structural adjustment programmes initiated by organisations following the Bretton Woods system, several countries in the region (including, Egypt during the Hosni Mubarak era and Tunisia during the Zine El Abidine Ben Ali era) started gradually to withdraw state subsidies for social programmes. In Egypt, Anwar Sadat’s policy of infitiṣah (meaning openness or open door), announced in October, 1974, aimed to reduce the state’s dominant role in the economy and reorient the country towards private initiatives and investments.65 However, in the Mubarak era the government’s role in social welfare programmes was reduced more substantially; spending for health did not match the needs of the population and resulted in high out-of-pocket expenditures and worsening of quality of services.66,67 The delivery of health care in Egypt was not equitable, with people having low incomes spending disproportionately larger amounts on health than did those with higher incomes.68,69 Similar to Egypt, the gap between healthcare demand and supply in Tunisia grew, worsening inequity in access to health services despite the development of the public sector and earlier improvements in living standards.70–71 Since the 1980s, the government initiated active privatisation policies aimed to increase private investment in health-care delivery.72 The result was a substantial increase in the number of private health-care facilities. The increasing demand for care in the private sector was mainly caused by a gradual disengagement of the state from the provision of care services and by increased active privatisation policies.52,62 For instance, the Gini index of inequity (measuring the extent to which consumption expenditure for individuals within an economy deviates from a perfectly equal distribution, with a Gini index of 0 representing perfect equality and an index of 100 implying perfect inequality) in Egypt and Tunisia is 30·8 and 41·4, respectively (table 1).73

In Yemen, phase 2 co-incident with the unification of the formerly divided country. Perhaps counterintuitively, such reunification did not support development of social services, nor did it put an end to the longstanding armed conflicts.74 In contrast, in the post-reunification era, state-subsidised social programmes (including health) seriously deteriorated in Yemen. This deterioration was exacerbated by the economic crisis of the early 1990s.75 These events increased the pace of liberalisation reforms with market tactics to subsidise the failing public sector at the expense of both equity (Yemen’s Gini index rank is 71) and quality.76 Since the mid-1990s, these reforms of economic adjustment programmes (introduced by international financing institutions) have concentrated on privatisation and the flow of foreign direct investment.77 Such modest reforms not only failed to improve access to and quality of public health services, but also increased the previously low levels of inequity in the country.78–80

Libya, by contrast with Egypt, Tunisia, and Yemen, did not follow the neoliberal movement that called for approaches of minimum interference from government and unrestricted markets for social services sectors (eg, health and education).81 However, Libya undertook steps to support transition to a more market-based economy,
including applying for World Trade Organization membership, reducing subsidies, and considering privatisation strategies.81

Phase 3: no global reversal of privatisation for countries in the Arab world

For many people, the effects from promotion of privatisation policies and structural adjustment programmes, especially in developing countries, were problematic.81 Findings from a comprehensive analysis of the effects of user fees suggested that the fees failed to deliver the benefits outlined in the World Bank agenda for 1987 reform report,84 and were a barrier to access for low-income and vulnerable populations.85,87 Additionally, contrary to beliefs at their introduction, user fees proved to be inefficient because their high administration costs were almost equal to revenues, with little evidence of their effect to reduce frivolous demand and redirect patients to cost-effective services.84,88,89 In view of this finding, many countries and international agencies began to reconsider the structure of health financing systems,84,90–95 beginning with World Health Assembly Resolution 58.33, entitled “sustainable health financing, universal coverage and social health insurance”, which was passed in 2005.96 The resolution urged member states to restructure their financing to make prepayment the dominant method of financial contribution, hence discouraging the use of point-of-service payments. However, although most developing countries have reconsidered privatisation policies and user fees, supported by evidence and the changing philosophy of international agencies, many countries in the Arab world have done the opposite.

Egypt continued to allocate fewer resources to health, although demand for health care has increased because of demographic changes (ie, population increases and shifts in the burden of disease). As a result, most of Egypt’s health spending (57%, with recent estimates putting it as high as 72%) comes directly from household out-of-pocket payments.97,98 At the same time, the Egyptian Government’s ability to finance the plan.

A year later, in 2009, another insurance law was proposed that echoed most of the earlier draft, most prominently in the introduction or increase in formal user fees. The planned implementation of new regulations for health insurance would have made patients contribute a large proportion of the costs of their medical treatment (up to 25%) and prescriptions (up to 30%).99 The draft was discussed in a parliamentary session in April, 2010, but its adoption was postponed because of concerns of the Minister of Finance at the time about the Egyptian Government’s ability to finance the plan.

In Tunisia, almost 95% of the population has insurance coverage, either through government schemes for poor and vulnerable groups (30%), or through social health insurance for workers in public and private sectors (65%) served by a national health insurance fund.100 Despite the presence of strong schemes for population health coverage, the trend for privatisation has continued. Between 1990 and 2008, the number of private hospitals increased from 33 to 99, whereas the increase in private bed capacity during the same period was from 1142 to 2578 (2.3 times higher), with a low average number of beds (26) per hospital. Strikingly, despite annual increases in the budget of the Ministry of Health (both running and investment), public facilities were underfunded and medicines were often unavailable because of budget spending limits. As a result, a two-tier system of service provision has emerged—one for the rich, who can afford to pay for high-quality private health-care services, and one for the poor, who cannot afford to pay and are served by a failing public sector100—which has contributed to the erosion of Tunisians’ right to health.

At the same time, and as part of continued and growing endorsement of structural adjustment reforms initiated by the government in the late 1980s, user fees were established in public facilities to compensate for diminishing government budgets.102 More importantly, the increase in private investment in health was accompanied by a gradual reduction in government share of total health expenditures, resulting from disengagement of the government from social spending (including health).102–104 Out-of-pocket spending grew to nearly 45% in 2008. This increase is explained by several factors, including active and passive privatisation generated by a weak public sector, balance billing for insured patients in the form of tariffs and co-payments, and provider-induced demand caused by dual practice (ie, doctors and other health-care staff holding more than one job) promoted in public health-care institutions. Findings
from equity studies have shown an increase in the number of households at risk of falling into poverty because of catastrophic health-care expenditures, further contributing to the level of inequity in Tunisia.69

In Yemen, phase 3 was characterised by further deterioration of state-subsidised health services, aggravated by serious sex and geographical inequities in use, access, and quality of health services.66–68 The government ran an inefficient and complex four-tiered health-care system (primary care in health centres and units, secondary care in district or governorate hospitals, tertiary care in referral hospitals in Eden and Sana’a, and treatment overseas for selected individuals”) with a parallel subsystem running in the unregulated private sector.6 With regard to health financing, structural economic and administrative reforms initiated by the government in the mid-1990s introduced nominal charges for services (user fees) as a complementary funding mechanism for the health system. These charges (which informally increased with time) became a substantial financial burden for many people in Yemen. Efforts in the past decade to institute a national health-insurance system have not materialised. This failure is of concern, because in the same period public expenditure on health decreased (from 35% to 28% of total health spending) and out-of-pocket spending increased (from 57% to 71%). Additionally, major discrepancies in the pattern of spending on health between rural and urban areas and the distribution of finances between the 21 governorates continued to increase.67

Unlike the other three countries, Libya had good natural resources that enabled it to pursue UHC. Although the country did not have a constitution, the right to free health care was mentioned in some laws and bylaws. However, erratic planning and poor use of valuable resources prevented it from capitalising on the global push towards UHC. For example, in 2000 a major decentralisation project was launched by the government, which included the abolition of several ministries (including health and education) and the transfer of substantial powers (eg, management of human resources, financial independence, and planning) to regional authorities.68 This policy was accompanied by a huge increase in the public-service workforce, from about 400 000 people in 2000 to 930 000 in 2005. Overstaffing in the public sector was accompanied by an inefficient policy of management of human resources and poor workforce planning (eg, poor mix of skills). Falling wages and unclear structures of responsibility led to widespread absenteeism and inefficient use of human resources. In response to the failure of decentralisation efforts, the government decided to centralise the public administration in 2006. Most of the ministries were recreated at central level, but have remained fairly weak.69 In parallel, the private sector has been passively encouraged to increase its involvement in service provision.68 This situation has resulted in a high level of supply of health-care services (Libya, with 37 hospital beds per 10 000 people, has the highest number per person in sub-Saharan Africa) provided in a two-tier system, with deteriorating quality of care and resultant poor trust in public health-care facilities. Additionally, out-of-pocket payments, which in principle should be similar to those of the six countries of the Gulf Cooperation Council (which have comparative national wealth), are substantially higher at 31·2%.68

Arab uprisings
In 2010, the onset of the Arab uprisings provided a stepping stone towards a new phase of substantial sociopolitical change in the four countries. Faced with uprisings throughout the country, Zine El Abidine Ben Ali fled Tunisia on Jan 14, 2011, after ruling the country for 24 years. Protests in Egypt forced Hosni Mubarak to resign in February, 2011, after serving for five consecutive terms (1981–2011). However, major instability persisted in Egypt beyond 2011. The Government of Egypt, led by President Morsi, was challenged by huge public demonstrations (June 30, 2013), which were followed by a military intervention that overthrew Morsi and his administration, and appointed a new interim president and cabinet. In November, 2011, Yemen’s President Ali Abdullah Saleh signed an agreement to step down and called for early elections in February, 2012. On Feb 21, 2012, presidential elections were held and Abdo Rabo Mansour Hadi was elected as the new President of Yemen. In March 2011, a National Transitional Council was formed in Benghazi, Libya, with the stated aim of overthrowing the Muammar Gaddafi regime and guiding the country to democracy. After several months of hostilities, the council took control of the capital Tripoli, overthrowing the regime. In these uprisings, demographic, social, and economic boundaries were nonexistent. For example, the presence and active participation of women in the uprisings in Yemen and Egypt was highly visible and instrumental. This participation is paving the way for more equitable policies as shown in the new constitutions and governmental policies of the Arab countries with the uprisings.

Towards UHC
A roadmap for action after the uprisings
Our assumption is that the Arab uprisings have created a sociopolitical momentum that should be capitalised on to achieve UHC. This assumption is guided by similar major sociopolitical changes in other countries. Yet, such a path is rife with challenges that need serious consideration by policy and decision makers (panel). Perhaps the greatest challenge is one that is common to all countries facing such major sociopolitical changes—ie, nation building and instating of democracy. Recent events in Egypt, Libya, and Tunisia, and to a lesser extent in Yemen, are a reminder of the challenges that lie ahead to reach a stable state capable of planning for and reaching
Panel: Challenges to reaching UHC in Arab uprising countries

UHC cannot be viewed solely from a health financing perspective, hence we have adopted a health sector-wide approach to address the challenges presented below.

Weak focus on primary health care
Although the primary health-care model in Egypt includes many community-based initiatives, it is applied as a medical model and does not include a community-participatory intersectoral approach. As a result, the system had a small effect on health outcomes, particularly for disadvantaged groups.\(^{112}\) In Tunisia, health-care facilities are located across the country, allowing most of the population access to primary health-care services.\(^{111}\) Therefore, the system has a good logistical access portfolio; the only restriction is related to financial access, when individuals have to pay user fees to get care in public facilities (excluding preventive care). Yemen has focused on primary health care as a cornerstone of health-service provision because of its dispersed population and more than 130,000 inhabited settlements in harsh geographical terrain. However, the main challenge to expand primary health services is the shortage of required financing and deployment of health staff to remote areas.

Unclear political landscape and social agenda
The election results in Egypt and Tunisia provided a stage for Islamic parties to ascend as majorities in parliament and, most probably, executive branches of government. However, these election victories were based on disposing of existing regimes rather than clear social programmes. Moreover, there is lack of consensus (mostly between people supporting Islamic parties and liberals) in some of the countries about the type of health systems that should be instituted (eg, regarding access to reproductive health services).

Investment in health and fragmented financing systems
Investment in health is a major indicator of a country’s commitment to the health of its citizens (eg, the Abuja Commitment in 2001). From a financing standpoint, UHC can best be achieved through mandatory prepayment. From a design perspective, this system is achieved through two routes: national health insurance or service, or social health insurance.\(^{113}\) Both approaches are challenging. First, in most countries that implemented UHC using national health insurance or service models and general tax revenue for financing, the tax-revenue system was well functioning.\(^{114,115}\) The problem in most low-income and middle-income countries, including Arab countries with the uprisings, is that the tax-revenue infrastructure is poor. Additionally, the Arab countries with uprisings face unclear economic prospects. Second, the social health insurance model relies heavily on financing from the population or contributions from beneficiaries; the presence of a substantial informal private sector in the four countries might restrict the ability of the system to depend on wages as a basis for contribution.\(^{116}\) in addition to the problem of increased unemployment in these countries. Another related concern is efficiency—specifically, fragmentation of financing and the operation of public facilities (eg, low occupancy, long length of stay).

Poor trust in public facilities
If UHC is to be pursued, government facilities should play a key part in the service delivery system. Such a role is not possible with the present lack of trust from the public regarding the quality of care delivered in public settings. In Egypt, the level of out-of-pocket payments to private providers signals patient preference and trust in the private sector.\(^{117}\) In Tunisia, public facilities have historically been the main provider of care for the population. Although this role prevails to date, the increase in the number of private providers and their scope of services over the past two decades is of potential concern, especially if coupled with the trend of decreasing capital investment by government and operational deficits in public facilities. In Libya, the widespread distrust of quality of care in health-care facilities meant that a multimillion dollar medical tourism industry arose in neighbouring countries. In Yemen, both public and private facilities are perceived as being of poor quality and are not trusted.\(^{117}\)

Sociopolitical instability and persisting emergencies
As with most uprisings that happened over history, the post-uprising phase is characterised by lack of stability, both in terms of security and societal functions,\(^{118,119}\) which is also occurring in the Arab countries with uprisings. The general unrest has resulted in disruption of health and social services\(^{120}\) in affected areas with mass refugee displacement to neighbouring countries. As such, social programmes including coverage and provision of health care cease to be the focus of attention compared with ensuring of security and basic societal needs.

Underdeveloped health information systems and evidence for policy making
A properly functioning health information system has been lauded as a cornerstone of any effective and equitable health-care system.\(^{121}\) Unfortunately, health systems in many low-income and middle-income countries are characterised by a poor health information infrastructure,\(^{122}\) reducing their ability to respond to challenges and to monitor systems performance in a timely manner. This theme is common to most low-income and middle-income countries, including many in the Arab world. In Yemen, an assessment of the national health information system in 2009 by the Health Metrics Network\(^{123}\) showed that the system is highly fragmented and inefficient with low-quality data. Egypt made some progress with the establishment of the Epidemiology and Disease Surveillance Unit at the Ministry of Public Health in 2000, but information generation and sharing is still seriously fragmented.

(Continues on next page)
Figure 3: A framework for progression towards universal health coverage in Arab countries with uprisings

UHC = universal health coverage.

(Continued from previous page)

Governance and institutional capacity (managerial and organisational structures) at ministries of health and social insurance organisations

One of the main challenges in the countries being assessed in this report is that the existing governance and organisational structures in the public health sector have not been modified for a long time—in some cases not since the earlier revolutions that brought the previous regimes into power—which is of special relevance for two reasons. First, the nature of public health and health care has changed during the past few decades, necessitating a modified approach to health and wellbeing. Second, the health systems have grown in depth and breadth into complex systems with which existing governance and organisational structures cannot cope effectively and efficiently. Reformation of these organisational structures to ensure compatibility with the requirements and challenges of a properly functioning health-care system has been a predecessor of health-care reforms in several countries. In Egypt, efforts have been made to decentralise institutional decision making to the governorates. However, most major decisions relating to organisational resources are still being made centrally, especially at the Health Insurance Organization. Since the end of the uprisings, health-care professionals in Libya have formed influential lobby groups that have contested the administrative, managerial, and policy-making structures that previously existed in the public sector, especially the issue of decentralisation. Many hospital directors and senior government figures have been relieved of their duties to make way for candidates deemed more acceptable to the public. However, many of the replaced candidates might only have been guilty by association with the old regime.

UHC = universal health coverage.

an optimum health system. We therefore present a roadmap for progression towards UHC (figure 3).

The main starting point for the path towards UHC is a country’s commitment to the right to health. The proposed roadmap acknowledges this right as a main prerequisite (as shown by societal values of solidarity and political and economic commitments of government). Many international entities discuss the notion of health as a right, but the most used definition is that of the UN Special Rapporteur Anand Grover from 2006: “the right to an effective and integrated health system encompassing health care and the underlying determinants of health, which is responsive to national and local priorities, and accessible to all. Underpinned by the right to health, an effective health system is a core social institution, no less than a court system or a political system.” However, even before this definition, a general comment was adopted in 2000 by the UN Committee on Economic, Social and Cultural Rights that operationalised all previous provisions of the right to health. The comment outlined four components of the right to health: sufficient availability and functionality of public health and health-care facilities; financial and physical accessibility to services and information in a non-discriminatory manner; ethical and culturally appropriate acceptability, factoring in sex-specific and age-specific sensitivities; and good quality and appropriateness of care. UHC, although mainly concerned with accessibility, should go beyond the financing component to ensure compliance with all four components in the Arab countries with uprisings.

However, the discussions about right to health in the four Arab countries with uprisings have not encompassed the practical aspect of health-care delivery. This aspect is of great importance because findings from studies in countries that have constitutional rights to health show that the right does not translate into or ensure UHC. Rather, the translation of that right into financing, governance, organisation, and delivery is crucial. The four Arab spring countries are deliberating health coverage as a priority in dialogues for new constitutions, national policies, political party programmes, and missions for non-governmental organisations, advocacy campaigns, and media. In view of recent events in Egypt, the path the new government will adopt is unclear. At the time this report went to press, a constitutional review committee had been instituted. In Tunisia, most political parties expressed commitment to provide universal access to health-care services during the election of the constitutional assembly, which was reaffirmed by the democratically elected government after Oct 23, 2011. In Yemen, the new government has included strengthening of health services in its programme for action, increasing coverage and
improving quality of these services as part of commitments for social and human development. In Libya, a national health systems conference was held in 2012. A roadmap for the future of health care was established that included a path towards UHC.

Prerequisites and enablers
Only through active societal engagement can the mistakes of earlier regimes be avoided. This engagement should be structured as an integral part of the path towards UHC—eg, through engagement with civil society organisations and creation of a public engagement commission. The role of the commission would be to solicit and receive feedback from stakeholder groups, individuals, and patients about existing or proposed health-system elements or policies, and generate specific recommendations to decision makers. The important role of societal engagement has been discussed as a key prerequisite for advancement towards UHC, whether in understanding of the components of UHC or requirements to move forward. However, social advocacy is needed, and is beginning to take shape. Findings from polls taken after the uprisings in selected countries in the region show that improved health care was a top priority for people living in these countries. In Egypt, equity campaigners and activists for social justice are involved in ensuring a more equitable health-care system and ultimately better health.

However, for the countries discussed in this paper and others in the Lancet Series about health in the Arab world, sociopolitical and economic stability is an important enabler. As with most uprisings in the past, the post-uprising phase is characterised by lack of stability, both in terms of security and societal functions. General unrest after the Arab uprisings has resulted in disruption of health and social services in affected areas, with mass refugee displacement to neighbouring countries. As such, social programmes (including coverage and provision of health care) cease to be the focus of attention compared with ensuring of security and basic societal needs. Political instability in Egypt is of major concern, in view of the civil unrest continuing through the preparation of this paper. In Tunisia, the new government, operating in a near-emergency mode, has not been able to articulate a clear vision for social and economic development (including health) and most pledges of international support for the revolution have not yet materialised. A new cabinet is under negotiation between the ruling Islamist Nahda party and liberal parties in the country. Libya’s new Ministry of Health has sought to revitalise the country’s “shattered health system”, but the extremely high burden of expectations placed on the new government has resulted in a difficult political climate, in addition to the serious security issues and calls for autonomy in the region. These issues have made substantive progress difficult and slow. The political instability in Yemen is even more pronounced—the loss of the power of the state has resulted in the appearance of armed groups in several parts of the country. Additionally, there are ongoing debates about how the post-uprising Yemen should be governed. A federation is being discussed, among other options. About half a million people are estimated by the United Nations High Commissioner for Refugees and the Office for the Coordination of Humanitarian Affairs to be internally displaced. This instability has postponed the social development agenda, including that of UHC, because of more urgent issues ranging from security to refuse collection and traffic.

In the roadmap towards UHC, evidence-based decision making and policy is a cross-cutting theme across all health sector functions, which should start with design of new or enhancement of existing health information systems. A properly functioning health information system is a cornerstone of any effective and equitable health-care system. Unfortunately, health systems in many low-income and middle-income countries are characterised by poor health information infrastructure, restricting the ability of these countries to respond in a timely manner to challenges and to effectively monitor the system’s performance. This failure has been partly blamed on international donors, who have actively contributed to the building of parallel information systems that match their sponsored vertical programmes, resulting in fragmentation. A main role of health information systems is to create information feedback processes at different health sector levels (eg, central and local delivery platforms) that assess health outcomes, processes, financial, utilisation, and quality indicators among others. Additionally, knowledge translation hubs would assist in promotion of evidence use in practice and policy. This implementation should be done in partnership with academic institutions to ensure methodological rigour in design, execution, and translation of evidence.

Stewardship and governance
In view of the challenges faced by Arab countries that have had uprisings, practical steps need to be taken to ensure that they can achieve UHC when the political context is more stable. One of the main challenges is that existing organisational structures in the public health sector have not been modified for a long time—in some cases, not since the revolutions that brought the previous regimes into power—which is of special relevance for two reasons. First, the nature of public health and health care has changed during the previous decades, necessitating a modified approach to health and wellbeing. Second, the needs of public health systems have grown in depth and breadth into complex systems that existing organisational structures cannot cope with effectively and efficiently. Reform of organisational structure to ensure compatibility with the requirements and challenges of a properly functioning health-care
system was a predecessor of health-care reforms in several countries (eg, Thailand). Reinforcement and consolidation of stewardship and governance in the health-care sector should include initiatives such as establishment of a national central coordinating committee for health (NCCH). We envision this committee to represent all ministries and social insurance organisations that deal directly with health care to improve coordination and efficient use of resources (eg, delivery of funds and services); the Ministry of Health should serve as the secretariat for the NCCH. Experience from other countries trying to achieve UHC showed that such a unified body is a crucial element to strengthen stewardship and form a collective decision making entity that spans all stakeholders in the health sector (eg, the role of the Consejo de Salubridad General [General Health Council] in Mexico). In parallel, organisational structures or functions and institutional capacity should be revised to ensure better efficiency and higher accountability. A strategic plan (with a roadmap) to progress towards UHC has to be subsequently devised and endorsed by the NCCH.

Costs, financing, and resources
The design of health-care financing is key to UHC. Two subcomponents are necessary. The first is estimation of UHC-related costs, which provides the means to assess budgetary needs. Countries that are actively considering UHC, such as India, are approaching the topic with careful consideration of costs as did other countries that successfully introduced UHC. Costing can be done on the basis of benefit packages at each care level (ie, primary, secondary, and tertiary). For some countries of the Arab uprisings, this process might be complicated and time-consuming. The alternative route is to estimate the costs of service delivery on the basis of historical trends, locality or facility feedback, and anticipation of what each uninsured person would use if they were covered by UHC. Although not a preferred approach, such a strategy could work in countries such as Tunisia, which has an established record of progress towards UHC. Second, the engineering of health-sector financing is a main strategic activity that needs the endorsement of stakeholders in health care. The functions of gathering, pooling, and purchasing have to be assessed, and strategic decisions reached. The process also includes coordination with international donors for development assistance for health and technical assistance.

Delivery platforms
The degree and quality of service delivery coverage and associated challenges vary among the four countries of the Arab uprisings, and in the Middle East in general. Strengthening of delivery platforms, especially public facilities, is a crucial step for progression towards UHC. For example, in its path towards UHC, Mexico coupled financial reforms with plans to strengthen supply platforms (eg, hospitals, drug supply, surveillance, and quality of care). Chile implemented similar changes in its journey to UHC, and investments to strengthen delivery platforms quadrupled from the 1980s to the 1990s. In all four Arab spring countries discussed in this report, upgrading of infrastructure and existing processes of care (rather than service capacity) is the main challenge, especially for primary health care. Additionally, in Yemen service delivery platforms have capacity and distribution issues. The ultimate aim of these strategic investments is twofold: provision of adequate coverage and enhancement of trust in public delivery system, both of which are key steps in the achievement of UHC. However, the role and potential contribution of the private sector cannot be ignored. Public–private partnerships to enhance the path towards UHC should be actively considered.

Conclusions
Most countries that have progressed to UHC did so in a phased approach. The four countries examined in this report, as well as others in the Arab world, have a golden opportunity to capitalise on the social equity dynamic created as a result of the uprisings to progress towards UHC. This process will be difficult and time-consuming, and will need solid commitment at all levels. Compromises will be needed at each stage to move the process forward. However, the risks of inaction at this stage are substantial. UHC should continue to be advocated as a cornerstone to a more equitable society—as much of a right as an investment. If policy makers and societies in the Arab countries with uprisings do not focus on UHC, it will be lost to the many other priorities and challenges that these countries are facing. To continue on this path, one issue should not be compromised: the right of individuals to health.

Contributors
All authors contributed to the design of the paper. SSS, AM, BS, SSi, and MSA contributed to the conceptualisation. SSS, MSA, and NMN coordinated data collection, review, and data analysis. SSS and NMN prepared the first draft. Country sections were prepared and analysed by SA, MZ, JN, and BS. SSS, MSA, and NMN formulated the final review of inputs and information from all coauthors and integrated the final version. All authors reviewed and approved the final version.

Conflicts of interest
We declare that we have no conflicts of interest.

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Health in the Arab world: a view from within 4

Changing therapeutic geographies of the Iraqi and Syrian wars

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The health consequences of the ongoing US-led war on terror and civil armed conflicts in the Arab world are much more than the collateral damage inflicted on civilians, infrastructure, environment, and health systems. Protracted war and armed conflicts have displaced populations and led to lasting transformations in health and health care. In this report, we analyse the effects of conflicts in Iraq and Syria to show how wars and conflicts have resulted in both the militarisation and regionalisation of health care, conditions that complicate the rebuilding of previously robust national health-care systems. Moreover, we show how historical and transnational frameworks can be used to show the long-term consequences of war and conflict on health and health care. We introduce the concept of therapeutic geographies—defined as the geographic reorganisation of health care within and across borders under conditions of war.

Introduction

War is a global health problem.¹ The repercussions of war go beyond death, injury, and morbidity. The effects of war are long term, reshaping the everyday lives and survival of entire populations.

In this report, we assess the long-term and transnational dimensions of two conflicts: the US-led occupation of Iraq in 2003 and the ongoing armed conflict in Syria, which erupted in 2011. Our aim is to show that, although these conflicts differ in their geopolitical contexts and timelines, they share similarities in terms of the effects on health and health care. We analyse the implications of two intertwined processes—the militarisation and regionalisation of health care. In both Syria and Iraq, boundaries between civilian and combatant spaces have been blurred. Consequently, hospitals and clinics are no longer safe havens. The targeting and misappropriation of health-care facilities have become part of the tactics of warfare. Simultaneously, the conflicts in Iraq and Syria have caused large-scale internal and external displacement of populations. This displacement has created huge challenges for neighbouring countries that are struggling to absorb the health-care needs of millions of people.

In describing the consequences of these conflicts, we introduce the term therapeutic geographies—the geographic reorganisation of health care within and across borders under conditions of war. Our analysis shows the need to use historical and transnational frameworks to understand the complex and long-term health consequences of contemporary wars and the challenges to those involved in providing health care in the Arab world.

Militarisation of health care

War in the Arab world

War has played a central part in shaping the modern history of the Arab world and the broader Middle East. Since the formation of modern nation-states under competing imperial powers, the region has endured colonial, anti-colonial, and civil wars, and long-term conflicts.² Since Sept 11, 2001, the Arab world has been one of the regions worst affected by the USA’s continued war on terror.³ In addition to military operations in Iraq and Afghanistan, the US military has coordinated air strikes and drone attacks in several other countries. According to war geographer Derek Gregory, the recent US-led wars have contributed to the “increased militarisation of the planet” and have produced a sense of permanent and pervasive war.⁴ The region has also had a proliferation of urban armed conflicts since the Arab revolts. These wars and conflicts have led to unprecedented large-scale movement of populations within and across national borders to seek security and health care elsewhere.⁵

The war on terror has contributed to a rise in anti-western sentiments and the proliferation of military, paramilitary, and terrorist violence.⁶ With US military forces entering private homes and other safe shelters and refugees in search of insurgents, the differentiation between civilians and combatants has become blurred. Moreover, it is increasingly difficult to distinguish the war on terror from the recent armed conflicts arising from the Arab revolts. The rhetoric of the war on terror is used by different Arab states to justify the repression of populations by governments.⁷ Different regimes, including in Iraq, Syria, Saudi Arabia, Bahrain, and Egypt, continue to frame the use of repressive military and police force as a necessary part of the war on terror.

Many recent conflicts in the Middle East have taken place in urban settings, and have involved various state, non-state, and foreign stakeholders (table 1). Conflicts have also been associated with increases in ethnic and religious tensions and civilian casualties, and a breakdown of state authority.⁸ The involvement of regional powers—eg, Iran and Turkey, has complicated the conflicts.⁹ High-income states of the Persian Gulf have played important parts in ameliorating and provoking violence through media control, financial support, and mediation of disputes through diplomacy.¹⁰ Additionally, militant transnational networks, such as al-Qaeda, Al-Nusra Front, and the Islamic State of Iraq and the Levant, continue to increase their recruitment and operations.¹¹

The effect of such conflicts in the Middle East on health care has been immense. Researchers have investigated
the immediate and long-term consequences of regional conflicts on public health and medical-care infrastructure in the region.14–16 The rebuilding of health systems continues to present a challenge after decades of conflict.17,18 Thus, a distinction between conflict and post-conflict cannot be drawn easily.

**Militarisation of health care**

A consequence of the recent wars in the region that deserves further attention and research has been the militarisation of health care—defined as the targeting and implication of medicine in warfare. The militarisation of health care follows the larger trends of the war on terror, where the boundaries between civilian and combatant spaces are broadly disrespected.

Violence against health-care facilities and professionals has been identified as a major threat to public health worldwide.19 A wide range of agencies, including local or national non-governmental organisations (NGOs), local health-care providers, and international humanitarian bodies are put at risk under conditions of war,20 a reality the US military has used as justification for increased military involvement in humanitarian assistance and the militarisation of aid.21 In recognition of the various ways that health care is affected under conditions of war, researchers have emphasised security as a prerequisite for health.22

Building on this research, we emphasise not only the problem of violence against health care, but also that health care itself has become an instrument of violence, with health professionals participating (or being forced to participate) in torture, the withholding of care, or preferential treatment of soldiers. This militarisation of medicine and health care—a process that has rendered the boundaries between health care and warfare indiscernible—has occurred in several Middle Eastern countries. In such contexts, the neutrality of physicians and hospitals should no longer remain unquestioned.

Instances of militarisation have been reported in nearly all of the armed conflicts arising from the Arab revolts. For example, Bahrain’s Salmaniya Hospital became the main site for confrontation between the state and opposition, as the police and military occupied the hospital and arrested doctors who were treating Shi’a demonstrators.23,24 Other cases have been reported in conflicts in Libya and Egypt.25,26 The broader effects of militarisation of health care have also been noted in the Iraqi and Syrian conflicts. Consequently, the challenge for health-care institutions is not merely to restore security, but also to rebuild the trust of society in the countries’ health-care systems.

**Iraq and Syria**

Iraq and Syria have overlapping political histories. Both states were created after the end of the World War I under the mandate of the League of Nations in 1920.27 Iraq was placed under the control of British rule, and Syria under French rule. Throughout the second half of the 20th century, the two countries were governed by repressive Arab Socialist Ba’ath party regimes. Although the Ba’ath party is thought to be a secular party that promotes an Arab nationalist ideology in Iraq and Syria two minority groups wielded power. The socialist ideology of these regimes shaped the development of robust and effective nationalised health-care services. In both countries, ruling parties viewed health care as a political issue, central to the foundational values of the state.28

Although Iraq and Syria also share a border and hold certain attributes in common, the two countries differ in their geography, demographic constituency, climate, and resources. Iraq is one of the world’s largest exporters of

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<td>Invasion and occupation</td>
<td>9 years and 9 months: March, 2003, to December, 2011</td>
</tr>
<tr>
<td><strong>Syria</strong></td>
<td></td>
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<tr>
<td>Civil war</td>
<td>Ongoing since March, 2011</td>
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Table 1: Conflicts in Iraq and Syria: global, regional, and local stakeholders
crude oil, which has been the main driver of social and economic development. It has also had a longer period of successive wars—the Iran–Iraq war, the first Gulf War, the UN sanctions, and the 2003 invasion and occupation, which overthrew the Ba’athist regime.

Nonetheless, wars in Iraq and Syria have some common features. Urban violence, widespread involvement of militia and non-state combatants, large-scale displacement to regional countries, and international military interventions have occurred in both. Because the development of health care and state-building were intertwined projects in both countries, the dismantlement of government institutions has necessarily entailed a deterioration in the health systems. Moreover, because medicine is crucial for negotiation of political power strategies during these conflicts, it has become used as a tactic of war—ie, the militarisation of health care.

The most recent war in Iraq emerged largely in urban settings. The occupation transformed neighbourhoods into war zones where the US military and their opponents clashed. The urban landscape was remodelled into securitised enclaves and no-go zones. Markets, homes, religious sites, and government buildings became targets of military operations and terrorist violence. The urban space became an experimental field of different technologies and weaponry of war and security, producing severe effects on the cities and the environment. Hospitals were not exempt from the proliferation of violence—12% were destroyed during the invasion.

As the US-led invasion became a long occupation, the collapse of the Ba’athist regime and the institutionalisation of a sectarian political system enabled militias to take control of government institutions. During this violent political transition, intimidation of public servants, kidnappings, and killings became the everyday norm. During the sectarian violence of 2006–07, Iraqi hospitals and the Ministry of Health (MoH) headquarters were deemed killing fields by the media. Patients and doctors were kidnapped and murdered inside hospitals by militias. Both insurgents and coalition forces fired at ambulances. In 2008, US missiles hit the Imam Ali General Hospital, Sadr City, and damaged 12 ambulances. Meanwhile, Iraqi soldiers detained 35 hospital staff members on suspicion of having treated Mahdi army fighters.

Since 2003, Iraq has had a mass exodus of health professionals, an event largely attributable to the targeting of doctors by militias and gangs (for ransom, retribution, and political leverage), and even by patients and family members. A survey of doctors working in Iraq’s emergency hospitals showed that 80% had been assaulted by patients or their family members, with 35% threatened directly with a gun. In the capital, doctors were 2–3 times more likely to be exposed to violence than were those elsewhere. The exodus of doctors has added to the devastation of the country’s medical care and public health. A study of Iraqi hospitals showed that by late 2007, the number of health professionals had decreased by 78% in Baghdad. By 2006, an estimated 18 000 of Iraq’s preinvasion 34 000 doctors had fled the country, 2000 had been killed, and 250 kidnapped.

So far, thousands of Iraqi doctors have been dispersed throughout Europe, Jordan, and the states of the Persian Gulf. The loss of health professionals compromises the ability to rebuild the formerly robust health-care system. The exodus of health professionals, many of whom were involved in medical education, severely hampers the ability of medical schools to train a new generation of physicians.

For the doctors who remain in Iraq, they must face not only insecurity, but also growing distrust towards the medical profession. Before 1991, the medical and moral authority of Iraqi health professionals was largely unblemished. Particularly since the 2003 invasion, with hospitals becoming deteriorated and no longer a safe haven, it has become increasingly common for Iraqis to question both the competence and neutrality of physicians. The unravelling of patient–doctor relationships has broader implications—across all government institutions in Iraq, the dismantlement of state infrastructure and the spread of corruption have fostered widespread distrust towards government employees.

The devastating health consequences of this war continue. The 1991 Gulf War, UN sanctions period, and 2003 US-led invasion have had lasting effects on the general deteriorating level of health-care services. The collapse of state authority and resulting insecurity pose long-term challenges to public health and health care, both in Iraq and the region.

In Syria, what started as an uprising worsened into a civil war spanning 2·5 years. This conflict now involves regional and international stakeholders (table 1), and has engulfed both rural and urban areas. The exact number of deaths is not known, but the UN estimates close to 100 000 deaths since the beginning of the crisis. Heavy weaponry and air strikes have inflicted widespread damage and loss of life in densely populated areas. Between July, 2012, and March, 2013, close to 4500 people, mostly civilians, died as a result of air strikes. Because of worsening conflict, coherent assessments of the effect on medical care and public health are very difficult.

As in Iraq, hospitals in Syria have become part of the battlefield. Both the regime’s military forces and anti-government armed groups have attacked or appropriated medical facilities. In areas controlled by the rebels, some hospitals have been renamed Free Syrian Army hospitals. In many hospitals, combatants have first priority in receiving care. Under such conditions, civilians have to struggle to access treatments. In April, 2013, WHO maintained that 57% of public hospitals had been damaged and 36% were out of service. Additionally, 40% of the country’s available ambulances have been damaged. Repeated air strikes on hospitals suggest that government forces have deliberately targeted these
facilities. For example, in Aleppo, in 4 months, jets launched at least eight attacks on one hospital, turning it into rubble. Many ambulances transporting the injured have been obstructed by the regime forces or taken by rebels to haul weapons.

Security forces have targeted and threatened doctors who refuse to withhold care from anti-government constituents. Such tactics force health professionals to choose between saving the lives of patients and preserving their own. So far, at least 160 doctors have been killed and many hundreds have been jailed. Orthopaedic and general surgeons have become primary targets of the military and anti-government forces because of their skills that are crucial for treating injuries. Injured people avoid assistance from state-run hospitals because of the fear of questioning, arrest, torture, or worse. Syrian hospitals and medical staff have become involved in repression and have participated in the torture of patients.

As in Iraq, the targeting of doctors has forced health professionals to leave Syria in large numbers. For example, in Homs—one of the cities that was worst affected by the ongoing crisis—at least 50% of medical doctors had left and only three general surgeons remained after 30 months of conflict. According to a March, 2013, report, only 36 doctors are currently practising within and around the city of Aleppo compared with 5000 doctors before the start of the crisis. Although the exact numbers are not known, Syrian physicians have fled to Lebanon, Turkey, and Egypt, whereas few have sought refuge in Europe. Some have fled to Turkish villages near the Syrian border to provide care to anti-government fighters and civilians. Meanwhile, Syrians are setting up secret field hospitals in Damascus and other cities. These makeshift facilities do not have the necessary equipment and staff to address the overwhelming medical needs resulting from such large-scale conflict.

Regionalisation of health care

The deterioration and militarisation of health institutions in Iraq and Syria has exacerbated an already worsening situation: as conflicts generate large-scale movements of populations across and within borders, the distribution of health-care services that displaced populations seek and access has shifted accordingly. Increasingly, neighbouring countries such as Jordan, Lebanon, and Turkey are absorbing the health needs of displaced populations fleeing violence. No longer can the health care in Iraq and Syria be conceptualised as being confined to the borders of the state.

Conflicts in both Iraq and Syria have compelled millions of people to cross borders into regional countries (the appendix shows the geography, scale, and dynamics of displacement and mobility from both conflicts). According to the UN High Commissioner for Refugees (UNHCR) Global Trends 2012 report, Iraq was the third highest source of refugees of any country worldwide (746,400), with most refugees residing in Syria and Jordan. This process of displacement added to the existing migration from Iraq to neighbouring countries that began during the 1990s, triggered by the repression of Saddam Hussein’s regime and UN economic sanctions. Syria was the fourth highest source of refugees (728,500) in 2012. Moreover, both countries have large numbers of internally displaced persons, with estimates varying by source, especially for Syria. According to the UNHCR’s estimations, Syria has 2·0 million internally displaced persons and Iraq has 1·1 million. However, the Internal Displacement Monitoring Centre estimates more than 3·1 million internally displaced persons in Syria. Although the health needs and conditions of internally displaced persons have been particularly precarious, they are not within the scope of this report.

Importantly, Iraqi refugees particularly challenge commonly held representations of the vulnerable refugee with a low income, living in a camp, and dependent on humanitarian assistance. Displaced Iraqis in Syria and Jordan come from diverse religious, ethnic, sectarian, and socioeconomic backgrounds, especially middle-income, urban professionals. These individuals typically avoid refugee camps and have instead established temporary or permanent residence in cities such as Amman or Damascus. They often have sufficient resources to continue to travel and even relocate their families to secure destinations further abroad. Many professionals travel continuously, shuttling back and forth between their country of origin and their host country. Sharing a common language, culture, and religion with host Arab countries, these migrants blend into the cities where they have resettled. As a result, this displacement remains largely invisible to international agencies and the media, although the displaced individuals contribute to reshaping the features of these neighbouring cities. The proliferation of Iraqi shops in some neighbourhoods of Amman, for example, has changed the face of these communities by making them look more Iraqi than Jordanian, but such transformations do not carry the symbolic power of refugee camps, and garner little international attention.

As of October, 2013, the conflict in Syria has displaced more than 2264106 people who have sought refuge in neighbouring countries and refugee camps, including 14959 Syrian refugees registered in north Africa. According to the UNHCR, the exodus of refugees was accelerated greatly during the first 5 months of 2013, with more than 1 million refugees leaving the country. Although camps in Turkey, Jordan, and Iraq host many of these refugees, most refugees have moved in with host families or into cities in Lebanon and Jordan. More than 1 million Syrian refugees are estimated to have moved to Lebanon, which had a population of only 4 million. Despite attempts to register these refugees by UN agencies and international organisations, the extent of those displaced internally and externally is not known. The length of the conflict and its effect on Syrian infrastructure, including the health infrastructure, will determine the future of the people in
this latest exodus. Many more people are expected to move out of Syria to seek refuge from the violence.

The large-scale movement of populations out of Iraq and Syria is reshaping health care in the region. Neighbouring countries and international organisations have struggled to absorb the medical needs of refugees. In the past decade, the Jordanian MoH has frequently pleaded for international aid to cover the costs of providing health care to both Iraqis and Syrians. The MoH said that the influx of Syrians in Jordan’s public hospitals is overwhelming the system. An estimated 70% of Syrians in Jordan live outside camps and are seeking care in public and private hospitals. Syrian admissions to public hospitals increased from 4,109 patients in January, 2013, to 10,330 patients in March, 2013. The Lebanese health system is based on a private model, meaning that many Iraqi and Syrian families are unable to pay the high costs of health care. According to a survey by Médecins Sans Frontières, 52% of displaced Syrians interviewed in Lebanon were unable to pay for treatments for chronic disorders. Refugee camps typically provide access to basic health services, but most of the Iraqi and Syrian refugees reside within urban centres. 63% of Syrians also reported that they had not received assistance from any NGO while in Lebanon.

In addition to refugees, increasing numbers of Iraqis and now Syrians travel temporarily to Jordan and Lebanon to be treated for wounds and chronic medical disorders. In Iraq, thousands of patients board planes and travel to Beirut or Amman for weeks or months to seek lifesaving medical and surgical care (panel). Many patients have had to sell properties and belongings, or have borrowed money to cover such expenses. Frequent return visits, modifications of travel routes, and a process

Panel: Hardships for Iraqi patients traveling abroad and a targeted doctor in Syria*

Journalist, Najaf, Iraq
In May, 2011, a journalist noticed a growth on his side. He had examinations at two different Iraqi hospitals, where the growth was identified as benign. When the tumour started spreading to other parts of his body, the journalist became worried: “There was one on my neck, one under my armpit, and one on my heart. And no one in my family was confident in the doctors’ judgment... Hospitals simply aren’t the same anymore, since the wars. You can’t trust their abilities.” A friend advised the man to seek care at the American University of Beirut in Lebanon. Not having any money to pay for the expensive trip, his friends and family members contributed money. He arrived in Beirut in September, 2011, and was quickly diagnosed with cancer. Now, roughly 1 year later, he has gone through several rounds of chemotherapy in Beirut. He travels back and forth from Iraq to Lebanon, each time staying at the same hotel. He reflected: “The care here is better than in Iraq. But it’s so hard to go back and forth. I miss my family. And we used to have hospitals that were just as good or better.” The journalist’s family are middle class and have spent about US $100,000 on his care in Beirut. Remembering a past era of medical excellence in Iraq with a mixture of pride and defeat, he says: “In the past, Iraqis used to come to Lebanon for tourism... now they come for treatment.”

Government accountant, Baghdad, Iraq
In July, 2010, a government accountant was diagnosed with non-Hodgkin lymphoma in Iraq. He doubted the diagnosis and travelled to Beirut for confirmation. Examinations at the American University of Beirut revealed Hodgkin’s lymphoma. Unable to pay for the expensive chemotherapy treatments in Beirut, he returned to Baghdad where treatment would be free. But he would not remain in Baghdad for long. He said: “After 6 months of treatment at the government hospital in Iraq, I realised I was in trouble. Tumours were spreading everywhere.” He returned to Beirut in February, 2011. The same doctor who had seen him 6 months earlier delivered the news: “Your treatment in Iraq has not been effective. We need to start from scratch.” The government accountant was panicking as he processed the consequences of this verdict. Above all else, he knew that finances would be a major problem. He returned to Iraq to raise funds. Over the past 1-5 years, he has gone back and forth from Iraq to Lebanon many times. Currently, he rents a small apartment in south Beirut and receives radiotherapy.

A targeted surgeon, Idlib, Syria
The surgeon had barely been out of prison for 2 weeks when his wife passed away from breast cancer. On the day of his arrest, security forces stormed his office in Idlib and detained him while he was at work. “They wanted to confirm that I hadn’t treated any of those injured at a demonstration the previous Friday.” He was detained for 10 days in a small cell with more than a dozen other arrestees, hit, humiliated, and then released with no apology. With ongoing heavy bombardment, the surgeon was accompanied only by the truck driver who agreed to transport his wife’s body to the outskirts of the city; the surgeon buried his wife by himself. At the army checkpoint the soldier uncovered his wife’s body and proceeded to question him about her death: “Not a single muscle in his face twitched as he returned the cover over her face and ordered us to move on quickly...there is no dignity for the dead anymore, and death itself has lost all sanctity.” As the violence in Syria continues and casualties increase by the hundreds, a surgeon has a valuable skill and is a probable target for attack and humiliation. With the safety of his 10-year-old son in mind, the surgeon, like many other health professionals, felt his decision to leave the country was inevitable, despite the uncertainty of finding work elsewhere.

*OD and MS have undertaken more than 60 in-depth interviews with Iraqi patients (and their family members) seeking care in Lebanese hospitals. SS of the patients have been interviewed three or more times during the course of their treatment. GAS and FMF are Lebanese and Syrian physicians, respectively, and thus have broad experience with patients and health workers expressing similar stories to those in this panel. OD’s and MS’s interview-based ethnographic research was approved by the institutional review board at the American University of Beirut, Beirut, Lebanon.
of trial and error to find good care contribute to increasing costs.\(^5\) Particularly for people with chronic diseases such as cancer, patients and families travel back and forth between Iraq and Lebanon, visiting family and gathering money between successive sittings of chemotherapy.\(^6\)

In Iraq, cross-border health-care seeking has become institutionalised through government policies. The Iraqi MoH once presided over arguably the most advanced national medical system in the Middle East. Nowadays, with deteriorated health institutions, the MoH has increasingly resorted to funding delegations of patients for complex treatments in Istanbul, Beirut, and Delhi. In Beirut, the Iraqi MoH contracted an entire ward of the Rafik Hariri Teaching Hospital. A full-time staff member at the hospital handles the periodic delegations of patients coming from Iraq.

In such contexts, the crucial question that needs to be addressed is the role of the private sector in exacerbating the inequitable access to health-care services. As Iraqis travel abroad for care, they seek both public and private hospitals in regional countries. In Lebanon, Iraqis can be found both at the high-cost, private American University of Beirut Medical Center, and the Rafik Hariri Teaching Hospital, a state-run hospital, which offers care as part of delegations funded by the Iraqi MoH.

**Understanding therapeutic geographies**

Scholars in the social sciences have argued that geographies are not fixed entities. This does not mean these geographies are not real, but rather that they are mapped, shaped, and defined by social, cultural, economic, and political processes.\(^6\) As we have argued in the Iraqi and Syrian cases, the movements of populations under conditions of war have contributed to a remapping or a geographic reorganisation of health care in the region.

The importance of understanding therapeutic geographies is punctuated by the scale of conflict-related migration in the Arab world and beyond. UNHCR data from the end of 2012 showed that displacement has been at a historical high with close to 45·2 million people displaced worldwide.\(^1\) At present, 55% of this displaced population originate from five countries—Afghanistan, Somalia, Iraq, Syria, and Sudan—all of which have been objects or potential targets of military interventions by high-income countries and protracted armed conflicts with involvement of state and non-state stakeholders. The UNHCR reports that 0·5 million Yemenis have been displaced—largely as a consequence of civil conflict in north Yemen. Libya had an estimated 550000 internally displaced persons in early 2011, with thousands more displaced in regional countries.\(^2\) Beyond the Arab world, civil armed conflicts in various African countries have generated mass internal population movements and cross-border displacement. The UNHCR reported 2·2 million internally displaced persons in the Democratic Republic of the Congo from recent conflicts, with roughly 70000 crossing the border into Rwanda and Uganda.\(^3\)

The health consequences and patterns of mobility resulting from conflict-related migration do not fit one pattern. In Sudan, the second civil war (1983–2005) and the humanitarian crisis in Darfur (2003–10) have contributed to the deaths of more than 2·3 million people, either through direct violence or as a result of war-induced famine.\(^4\) Displacement patterns in Sudan have involved large-scale movements of rural populations into urban centres\(^5\) and to surrounding countries—notably, this rural-to-urban displacement differs from what has been witnessed in Iraq and Syria, where predominately urban conflicts have resulted in massive displacements and demographic shifts within cities and movements of populations to neighbouring countries. Malaria, cholera, measles, meningitis, and malnutrition are all prevalent and are further compounded by the dilapidated health infrastructure.\(^6\)

By contrast, waves of displacement from middle-income urban populations such as those in Syria and Iraq pose different kinds of health challenges (table 2). The disease burden is not mainly related to outbreaks of epidemics or malnutrition, but rather to an absence of access to secondary and tertiary care needed for the continuation of treatments for chronic diseases and injuries. Moreover, health-care delivery is complicated because urban refugees largely avoid camps.\(^6\)

Our understanding of therapeutic geographies builds on scholarly work on conflict-related or forced migration.\(^7\) No longer are migrants framed as remaining within a state-centric model of either integration (into the host country) or return (to the country of origin). The mobility of displaced persons is dynamic and multidirectional, as migrants establish connections with numerous and varied locations. Moreover, migrants seeking refuge from violence cannot be framed and presented as mere victims but as people using various strategies to acquire health care and remake their lives.\(^8\) By emphasising these strategies, the lines between so-called forced and voluntary migration become more complex and hazy.\(^9\)

International health organisations, such as WHO, have adapted the health systems framework to analyse the various institutions, resources, and state and non-state stakeholders meeting health needs of conflict-affected populations.\(^3\) Although accounting for organisations involved in health service delivery, the health-systems framework has not adequately taken into consideration the implications of millions of displaced persons dispersed throughout the Middle East, with most not seeking health care in camps. Our frameworks of analysis should account for the remapping of health care and blurring of boundaries between different health systems in different countries. As exemplified in the case of the Iraqi Government contracting wards of hospitals in Lebanon, it is becoming increasingly hard to draw firm lines between different national health systems, even those that do not share a border.
Recognising this complexity, we propose the notion of therapeutic geographies as an important concept that can provide a more dynamic and transnational approach to understand global health problems and the health-care needs of war-torn populations. Addressing medical care and public health in the Arab world and other parts of the world racked by similar types of conflicts requires an awareness of the reshaping of health-care geographies, people’s mobility and survival strategies, and the structural forces shaping them.

Conclusions

This report describes two interrelated processes: the militarisation and regionalisation of health care. Medicine has become both a target and an instrument of war in both Iraq and Syria. At the same time, health-care needs have become dispersed throughout the region, such that the health-care system can no longer be thought of as being confined to the borders of the state, or as operating according to a health-systems framework. In analysing the complexities of these events, we have introduced the concept of therapeutic geographies. Our approach shows that a dynamic and global perspective is needed to understand the consequences of war and conflict on health and health care.

As suggested by others, attempts to provide specific recommendations to address the militarisation of health care is beyond the scope of the health-care community, and falls within the arena of law and politics, with state and militia armed forces abiding by measures ensuring the safety of the injured, patients, and health professionals alike in turbulent and war-ridden contexts. We hesitate to offer specific policy recommendations to counter the militarisation and regionalisation of health care described in this report because these concepts are not completely understood. Moreover, the large scale of the transformations in health care is greatly disproportionate to the capacity of governments and humanitarian stakeholders to devise and implement solutions. Our policy-related argument is to implore the international community to take the long-term health effect of military interventions into serious consideration, and therefore, to challenge the rhetoric of any government that wages war for allegedly humanitarian reasons. The US-led war in Iraq and the Syrian civil war have resulted in an ongoing health crisis that might never be fully appreciated or quantified. As consequences of these conflicts, the militarisation and regionalisation of health care have and will continue to result in the disruption and the loss of lives, extreme difficulties in accessing treatments, and deterioration of the patient–doctor relationship.

Building on the concept of therapeutic geographies, global health analysis of these protracted conflicts is needed to introduce new transnational methods of inquiry so that we can begin to understand, before we are able to provide answers to, health problems of populations enduring protracted and long-term conflicts. Such analyses must include the voices and experiences of populations and health professionals affected. Scholars should investigate the patterns through which medical care is sought under such conditions, or is outsourced by governments beyond the boundaries of nation-states. The needs of populations displaced by wars and conflicts extend beyond the short-term interventions of humanitarian organisations. The importance of addressing the medical and public health needs of these populations more holistically, including providing for the care of non-communicable diseases, other chronic disorders, and mental health, is crucial. More research and development of relevant and contextualised metrics are required to uncover the cost and burden incurred by the displaced populations, and the effect of this displacement on neighbouring health systems.

Contributors

OD developed the concept, did literature research, gathered, analysed, and interpreted the data, and wrote the paper. MS developed the concept, did the literature research, gathered, analysed, and interpreted the data, and...
wrote the paper. VKN developed the concept, did data interpretation, and writing. WFF did data gathering, data analysis, data interpretation, and writing. GAS developed the concept, and did data interpretation. ZM did the figures and data interpretation. RG developed the concept, did data interpretation, and writing.

Conflicts of interest
We declare that we have no conflicts of interest.

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Health in the Arab world: a view from within 5

Health and ecological sustainability in the Arab world: a matter of survival

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Discussions leading to the Rio+20 UN conference have emphasised the importance of sustainable development and the protection of the environment for future generations. The Arab world faces large-scale threats to its sustainable development and, most of all, to the viability and existence of the ecological systems for its human settlements. The dynamics of population change, ecological degradation, and resource scarcity, and development policies and practices, all occurring in complex and highly unstable geopolitical and economic environments, are fostering the poor prospects. In this report, we discuss the most pertinent population–environment–development dynamics in the Arab world, and the two-way interactions between these dynamics and health, on the basis of current data. We draw attention to trends that are relevant to health professionals and researchers, but emphasise that the dynamics generating these trends have implications that go well beyond health. We argue that the current discourse on health, population, and development in the Arab world has largely failed to convey a sense of urgency, when the survival of whole communities is at stake. The dismal ecological and development records of Arab countries over the past two decades call for new directions. We suggest that regional ecological integration around exchange of water, energy, food, and labour, though politically difficult to achieve, offers the best hope to improve the adaptive capacity of individual Arab nations. The transformative political changes taking place in the Arab world offer promise, indeed an imperative, for such renewal. We call on policy makers, researchers, practitioners, and international agencies to emphasise the urgency and take action.

Introduction

Although Arab countries agreed to the 1992 Rio Declaration on Environment and Development, the past two decades have seen accelerating degrees of environmental degradation and depletion in the Arab world.1 In fact, use of natural resources is currently about twice that of the biocapacity. In 2008, countries in the Arab world had a footprint that was 150% greater than their biocapacity, much like the UK and parts of Europe (figure 1A), with the gap clearly continuing to widen (figure 1B). In public health, despite reported progress of selected indicators, the burden of disease is high, and environmental factors such as access to energy, nutrition, clean water, and clean air are important determinants of infectious and non-infectious disease prevalence.2 The need for a new framework to achieve human development objectives without undermining the ecological basis of life3—emphasised in the discussions leading to and following the Rio+20 UN conference, and articulated in the adopted document4—is especially relevant for the Arab world. Projection of threats beyond the framework of sustainable development, into explicit discussion of the prospects of social, economic, or physical survival of human populations has been made.5 However, this research has had little resonance in the health literature.6 The disconnect between policies about population, environment, development, and health is one of the biggest problems facing the Arab world. (We use the terms Arab world and the region interchangeably when referring to the group of Arab countries as defined in Mokdad and colleagues’ study; however, we use the term Arab countries when national aspects are especially relevant to the context of the sentence.)

This report follows two overarching lines of enquiry. We argue that the Arab world is facing threats great enough to call into question its survival, then make the case for using survival as an analytical concept in studying dynamics driving the threats. In doing so, we emphasise the inseparability of the biological and social dimensions of survival and the political nature of these dynamics. First, we assess the nature and extent of the threats by focusing on population, environment, and development; second, we discuss their connections with health; third, we critically analyse the discourse on health, development, and environmental sustainability in the Arab world and the way it might help or hinder proper understanding of their interactions; fourth, we define the most pertinent research and practice implications of our analyses.

Threats to human settlements

The Arab world is undergoing a palpable decline in environmental resources.7 Threats exist in three crucial domains: urban expansion (panel 1, figure 2), water (panel 2, figure 3), and land and food (panel 3, figure 4), which are interlinked through common underlying dynamics. The trends suggest that some Arab cities and countries, or substantial parts of them, are close to depletion of resources needed for viability of human living. For example, the recent prolonged drought in Syria has caused major population movement and upheavals.8
Damascus, Sana’a, and Amman all have severe water rationing regimes in place. The infrastructure, environmental deterioration, and water deficits in the Gaza Strip, occupied Palestinian territory, will make it uninhabitable by 2020. Coastal settlements and economic productivity in Qatar and Egypt are extremely susceptible to sea-level rise—with vast stretches of the Nile delta set to be lost. Abu Dhabi, Dubai, and Muscat are considering or building giant water reservoirs as contingency for scarcity or war. Saudi Arabia is investing in food-producing land in Africa as it begins to roll back decades of investments in local agriculture, which has been unsustainable.

What are the dynamics underlying these threats? What causal relations do these dynamics hold to health? How are they best understood and what changes in discursive practices are needed for such an understanding? How are they best tackled? In the next sections, we attempt to answer some of these questions.

Population–environment–development dynamics

Analytical approach

Complex interactions between population trends (P; figure 5), changes in ecological systems and the environmental services they provide (E), and development histories and pathways (D), drive threats to ecological sustainability in the Arab world (panels 4 and 5).

Here we use similar lines of enquiry to those used in political ecology, cultural ecology, and environmental politics, all of which emphasise the role of power and its distribution as fundamental in understanding the relation between societies and their natural and built environments—especially in the way power relations produce differential access to environmental services and differential exposure to environmental hazards. Unique features of the Arab world generate specific predispositions to these dynamics. For example, poor availability of freshwater and large endowments in fossil fuel have partly determined development trends and patterns of population concentrations and movements. Social hierarchies and prevalent cultural and religious world views, such as the desirability of children, tribal and clan loyalties, and beliefs about gender and old age, favour some development and population policies over others. However, important differences exist between various parts of the Arab world, reflecting the rich diversity of ecosystems, cultures, and development and political histories of the region.

We structure our discussion around four major threads linking the PED triad: population trends of urbanisation and migration; rising water scarcity and food insecurity; climate change; and war, conflict, and global transformations. In searching the vast amount of published work covering these topics, we have relied on the extensive knowledge we have gained through our respective areas of expertise, credible reports by international organisations as a source of synthesised data, and direct access to development and health databases.

Urbanisation and urban poverty

About 57% of the population in the Arab world live in cities, and this figure is projected to reach 70% in 2030, because of migration and natural increase (panels 1 and 4). Much of urbanisation has been driven by economic rents, such as resource exports and ownership rights, with little productive base (panel 5). The inflationary expansion of the public sector, through various forms of employment guarantees, compensation policies, and urban bias in the location of, and support for, public enterprises, has been another factor in urban growth. In some countries, environmental and war-related migrations have also played a large part. For example, in Syria, even before the current conflict, the
Panel 1: Urban expansion

The most far-reaching population change over the past 50 years has been, arguably, the rate and extent of urbanisation, combined with high levels of internal and external displacements of populations driven by war and economic and environmental stress. Urban populations in the Arab world have increased by 2300% since 1950, whereas the overall population increase over the same period has been about 300%.  

57% of the population in the Arab world is estimated to live in cities. This proportion is projected to increase to 70% in 2030. These figures, however, hide substantial regional variations. The Mashreq, comprising Egypt, Iraq, Jordan, Lebanon, occupied Palestinian territory, and Syria, is mostly urban, with the urban proportion of the population ranging from 43% in Egypt to 87% in Lebanon. The Maghreb, comprising Algeria, Libya, Morocco, Tunisia, and Mauritania, is generally urban except for Mauritania. With the exception of Djibouti, the least developed Arab countries—Comoros, Sudan, Somalia, and Yemen—are the least urbanised, with 30–40% urban. The Gulf Cooperation Council (GCC) countries—Saudi Arabia, Qatar, United Arab Emirates, Kuwait, Bahrain, and Oman—make up a special case of mostly city states where 80% or more of the population live in urban areas. The least urbanised countries are undergoing the highest urban growth rates and have the largest proportions of dwellers in informal settlements.  

Increasingly, many cities are becoming hosts for people with low income. In Amman, an estimated 12% of the urban population has a low income, but 71% of all those living on a low income in Jordan live in urban areas. In Djibouti City, 69% of urban dwellers live below the poverty line. In some cases, people with low income living in urban areas are moving into historic centres of cities, as has been seen in Aleppo and Cairo. They live in informally and precariously built environments (the ashwayyat), an occurrence that has proliferated in almost all cities except for those in the GCC. In Cairo, 62% of families live in informal settlements. The city’s Manshiet Nasser slum alone houses around 1 million inhabitants living in poverty under precarious environmental conditions.  

In countries that have undergone conflict and collective violence—such as Sudan, Somalia, Comoros, Yemen, Lebanon, and Iraq—refugee camps and informal suburbs often become spatially interconnected and account for a large proportion of the urban population (about 50% in Lebanon and Iraq, 67% in Yemen, 69% in Comoros, up to 74% in Somalia, and 85% in Sudan). Although urban populations in the Arab world have better and almost universal access to water and sanitation than do their rural counterparts, the quality of service is highly variable and poor health outcomes, associated with poor living conditions, persist, especially in informal settlements.  

of thousands of people to move to cities, aggravating problems of employment, housing, and infrastructure and accelerating a long-term urbanisation trend. 

The growth of the formal sector in many cities is insufficient to absorb the population, with informal housing and insecure, low-paid work becoming the only option for many people. Informal settlements seem to be especially widespread in the poorer, fast-urbanising Arab countries (panel 1; figure 2). In cities such as Sanaa and Cairo, concentrations of urban poverty are usually found on precarious terrain where populations have poor sanitation and lack of access to safe water, and where droughts, floods, and heatwaves occur—conditions associated with several health problems, especially
Panel 2: Water

Present and future data on freshwater availability and water demand are pessimistic. The per-person share of water has dropped by more than two-thirds, from a mean of 3035 m³ between 1958 and 1962 to 973 m³ in 2003–07, and to the current level of 743 m³ (2011 data)—which is far below the water poverty level of 1000 m³/person per year. The per-person share of freshwater is only 10% of that for the world, and 14% and 20% of what it is in other parts of Africa and Asia, respectively. 16 Arab countries have a per-person share of water below the poverty level, of which 11 are already below the absolute water poverty level of 500 m³/person per year.18,20

Only six countries do not have water poverty: Mauritania (3219 m³/person per year), Iraq (2751 m³/person per year), Comoros (1592 m³/person per year), Somalia (1538 m³/person per year), Sudan (1445 m³/person per year), and Lebanon (1057 m³/person per year). Four of these countries, however, depend on surface water that originates in major rivers descending from highlands outside the Arab world: Mauritania receives 97% of its freshwater from the river Niger; Egypt and Sudan rely on the Nile for 97% and 77% of their supplies, respectively; Iraq depends on the rivers Euphrates and Tigris for 72% of its supplies; and Somalia receives 59% of its freshwater supplies from the rivers Juba and Shebelli that descend from the Ethiopian highlands. Thus the only two Arab countries that can provide enough water supplies for their populations without being dependent on other countries are Comoros and Lebanon.

151,137 million m³ of renewable freshwater is currently available to the Arab world, of which 82% is surface water, mainly transboundary, and the remaining 18% is groundwater originating in the region. In 2040–50, the total renewable water supply is projected to decline by 13% to about 131,000 million m³, whereas the demand, which is about 181,000 million m³, will rise by 65% to 300,000 million m³. These data imply that, by about 2050, the prevailing water shortage in the Arab world will become much larger as the existing deficit between demand and supply continues to widen. On the basis of climate change projections, the situation might be even more critical and all Arab countries are likely to face serious water deficits by 2040–50 when the total renewable water shortage will be about 200,000 million m³ per year.19

This deficit is expected to affect all sectors of development. The agriculture sector alone will need about 182,000 million m³ in 2040–50 (50 million m³ in excess of the available renewable resources by then) despite the expected decline in the share of the total consumption from 80% to 60%. The demand in the municipal and industrial sectors will increase by two or three times as consumption rates rise to 24% and 16% of the total demand, respectively.

waterborne diseases.44 Slums are often sites of small-scale industrial production, using informal adult and child labour with attendant occupational health hazards.45–47 And yet, cities offer the possibility of economies of scale in the provision of sanitation, education, and health care, and better connectivity to global market opportunities. Such prospects remain underachieved in the region even though cities have better living conditions than rural areas overall.

Several factors make the challenge of turning cities into productive bases of economic and social development more formidable, including climate change, the quasi-permanent state of conflict faced by many countries, weak or corrupt public services, persistent inequities in access to resources within cities, the changing population age structure (panel 4), and changing patterns of regional labour mobility. In Gulf Cooperation Council (GCC) countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates), high unemployment, especially in young, educated adults, has led governments to attempt to reduce reliance on foreign labour, especially workers from other Arab countries.48 In lower-income, labour-exporting Arab countries, families typically pursue several sources of income, with some members migrating abroad or to urban centres for work and some seeking education, whereas those in rural areas sometimes remain to tend farms.49 However, with larger numbers entering the job market, high youth unemployment, smaller families becoming the norm, and remittances from expatriates in GCC countries and elsewhere declining, these survival strategies might be less viable in the future. Few housing and employment opportunities in cities, combined with social and cultural change under modernising pressures has made it difficult for urban dwellers to maintain extended kin ties, with male migrants to cities often leaving families behind and religious conservatism increasingly playing a role in regulating kin and gender roles and relationships. Will new forms of survival strategies emerge, with family ties constantly renegotiated under changing economic conditions and urban settings? What kind of economic and social policies are needed to allow this to happen?

These questions draw attention to the links between patterns of economic development and population and social change under environmental stress. These links operate at various timescales, with both sudden shocks and slow, long-term changes in one of the poles of PED dynamics affecting the other two (table 1).

Water scarcity and food security

Water scarcity plays a multifaceted part in the Arab world. It is an abiding characteristic of this arid part of the planet, an immediate difficulty in supply to be managed by society, and an important determinant of several infectious diseases,49 such as diarrhoea, cholera, dysentery, and typhoid, and some non-infectious diseases. For example, a high prevalence of methaemoglobinaemia in infants in the Gaza Strip is believed to be caused by high levels of nitrate in drinking water.50,51 Water supply per person is a quarter of its 1960 value, and the total demand is 16% higher than available renewable freshwater resources.52 An increase in demand as a result of population growth and a rise in affluence, combined with a decline in supply due to climate change (especially changes in rainfall and seawater intrusion into groundwater reserves) and groundwater overuse, will push this figure to 51% by 2050 and place most Arab countries under the absolute water-poverty level, defined as 500 m³ per person53 (panel 2). Dependence on desalination has accelerated (79% of all water supplies in the GCC countries), causing some detrimental environmental effects—mainly high levels of energy consumption leading to large greenhouse-gas emissions and brine and chlorite effluents causing damage to human health, groundwater, and sand dune and wetlands ecosystems.54–57
Industrial geopolitical uncertainty. From a strategic water-demand perspective, a strong disconnect between population trends and water resource allocation seems to exist, leading to conflicting pressures on policy and development directions. 57% of Arabs live in cities, whereas 88% of available freshwater is used for agriculture, highly inefficiently, contributing only 5-4% of gross domestic product (GDP). Historically, the agricultural sector has been adopted as a development pathway in some Arab countries (eg, Egypt, Saudi Arabia, Sudan) to achieve food security and rural regeneration and reduce urbanisation—none of which has been successful. However, despite the investment, crop productivity, especially of cereals, is among the lowest in the world, and the mounting share of imported cereals in Arab diet generates dangerous dependency on international price fluctuations (panel 3). The more recent trend of some GCC countries of investing in agricultural land in some parts of Africa can be problematic because it puts a premium on much-needed food in Africa. It raises questions about competition for food and water rights between investor and local populations, creates conditions that can lead to famine in the host countries, and leaves food supply of investors open to geopolitical uncertainty.

The question then is how best to ensure adequate water and food supply in the short and long terms, despite declining reserves, climate change threats, receding arable land, growing population needs, and mounting pollution. Most publications about water in the Arab world call for major environmental management measures such as regional cooperation that protects watersheds, improvement of efficiencies in distribution, introduction of pricing strategies for different usages, and implementation of incentives for conservation, especially in Arab cities in the Persian Gulf such as Dubai, Kuwait City, Doha, and Manama where per-person demand is among the highest in the world. The potential for infrastructure improvements is indeed large because surface water usually originates from outside the region, with urban centres often located at the far, downstream end and leakage reaching up to 50%.

A few publications advocate the integration of policy making in the food and water sectors, around the concept of virtual water, which recognises the water value inherent in crops and meat, whether imported, exported, or locally produced for local consumption. This approach could help to push the Arab agricultural sector towards specialisation in water-efficient crops and concentration on agriculture in less water-stressed parts of the Arab world. With this approach, food security is achieved through diverse food sources rather than national self-sufficiency, with some staple crops imported through global or regional markets. Others have argued that market logic inevitably leads to unsustainable agricultural prac-

tices and called for non-market-based state intervention to support both sustainable food production and conservation of agrarian landscape. Either way, water scarcity has to be an overriding consideration in agricultural policy. Worldwide, researchers have recently called for fundamental shifts in nutritional consumption patterns—such as a reduction in the proportion of animal protein in diets from the current 20% to 5% in 2050, because of the higher water efficiency of crop protein relative to animal protein—to bring about water and food security amid population increase.

Climate change
Anthropogenic climate change is further undermining the ecological and socioeconomic basis of life in the...
Panel 3: Land and food

The Arab world has high levels of aridity and desertification that restrict the land that is available for cultivation. Growing demand for food is increasingly met by reliance on imports, leading to major price fluctuations.

The region is part of a belt that extends across Africa, north of the equator, to western Asia, dominated by hyper-arid conditions. About 52.5% of the total area of the region is desert, which is not suitable for agricultural development with the current climate and water scarcity.19 Another 44% consists of rangeland areas and only 3.4% of the total area is productive farmlands that are available for cultivation, of which 0.7% (8825 km²) is irrigated and 2.7% (36151 km²) rain fed.

Thus, most countries have extremely little land available for farming. Only Tunisia, Syria, Morocco, and Lebanon have farmlands that are between 5% and 25% of total land area. In the remaining countries, agricultural lands are predominantly rangelands that are prone to desertification and contribute poorly to agricultural economies.19 This type of environment partly explains the low productivity of agricultural land, particularly cereals, with the Arab world using twice that of the world’s land area needed to produce the same amount of cereals.20

Although production of cereals increased by 60% between 2000 (35.7 million tonnes) and 2009 (57.2 million tonnes), almost 95% of this increase was from six countries (Algeria, Egypt, Morocco, Sudan, Syria, and Tunisia). This increase is not reflected in the production of wheat. In 2009, Algeria was still importing 67% of its wheat, Egypt 26%, Sudan 57%, and Tunisia 22%.20

With net imports of 58.2 million tonnes (2007 data), Arab countries are the largest importers of cereal in the world.21 The gap between demand and supply continues to increase and by 2030, the amount of imported cereal required by the region is expected to rise to 73 million tonnes.

Changes in the hydrological cycle will lead to a decline in freshwater supply and agricultural production, the anticipated rise in sea level will inundate and erode vast stretches of coastal settlements, and extended periods of drought are already causing losses to agricultural and pastoral land and rural livelihoods. These effects—assigned different levels of confidence by the International Panel on Climate Change and seen as illustrative rather than predictive—are set to have major implications for water and food security, and for health and the spread of disease. The increase in the frequency and amplitude of extreme weather events such as droughts, floods, and heatwaves is making obsolete traditional arrangements that have evolved from experience in dealing with weather events, such as drainage infrastructures, emergency services, and water-sharing systems. The recent extended droughts in Algeria and Syria cannot be firmly attributed to greenhouse-driven climate change; however, they are examples of catastrophic climatic events that have overwhelmed the ability of existing social and institutional structures to deal with them, leading to suffering, injury, and death. One study in Yemen projects a substantial decline in income for non-farming rural households as a result of flooding, loss of yields, and global rise in food prices (figure 6).21 Results of another study showed that limits to the physiological tolerance of heat stress might lead to loss of productivity in low-income and middle-income countries where outdoor manual labour, especially in the agricultural sector, is prevalent.22 Under a scenario of small reductions in worldwide greenhouse-gas emissions over the next few decades, a more than 15% chance of a rise in mean global temperatures greater than 4°C by 2100 is predicted.23

This rise could occur earlier under no-reduction policies, bringing about even more devastating effects. By increasing the prospects of poverty for part of the population, climate change threatens to reverse important human and economic development gains achieved over the past few decades.25

Climate-change effect projections should be interpreted against the background of other demographic and environmental transformations affecting the region, and global change in trade and international relations and the decline of welfare states. The process by which rural populations move to cities, live under precarious subsistence conditions, and exercise more pressure on urban ecosystems is mirrored and amplified by two climate pressures: on the one hand, drought and declining rainfall, which undermine rural livelihoods and, on the other hand, sea level rise, floods, and heatwaves, which threaten the more susceptible urban dwellers—usually newcomers from the countryside or refugees, such as the Palestinians in Lebanon or Darfurians in Cairo—who tend to live on land that is more exposed to environmental stress. Therefore, climate change mostly exacerbates existing and already urgent weaknesses intimately related to poverty and disadvantage. Furthermore, adaptation to the effects of climate change (eg, on desertification, sea-level rise, and water management) will probably not succeed without regional cooperation between Arab nations, which is unlikely under current political conditions.26

War, conflict, and global transformations

Fundamental changes in the economic and political organisation of the world and the modes of interaction between its populations over the past few decades (eg, the collapse of the eastern European Soviet bloc, increased US military presence in the Arab region, shift of the world’s manufacturing centre of gravity towards Asia, rise of the information economy, retreat of the welfare state, consecutive financial shocks of the 1990s and 2000s) have created at least two conspicuous fault lines in the Arab world.

First, GCC states, supported by a steady flow of hard currency from petrochemical exports, have maintained strong welfare provision and political stability, combined with repressive and socially conservative state agencies. Internationally, they have played an increasingly important economic and political role in the US-led world order. The rest of the Arab world is teetering between its repressive and welfare provision instincts, and its foundering finances and the now vocal aspirations...
of its people. As welfare has been unravelling under neoliberal policies since the 1980s, non-state actors have moved to fill in the gaps left by the state in the supply of social services. The history and vagaries of access to universal health care in Egypt, Tunisia, Libya, Lebanon, and the occupied Palestinian territory are emblematic in this regard.77

Second, the Arab world has undergone war and lower-level violent conflict, within and between states, triggering immediate processes of population movements, institutional paralysis, and environmental decline.78 For example, well documented cases of heavy metal soil contamination in the Gaza Strip,79 forest logging in Darfur,80 petrochemical contamination of sea and soil in Lebanon,81 systematic marshland destruction in southern Iraq,82 and burning of oil wells in Kuwait83 with consequent air, soil, and groundwater pollution, are all direct effects of military conflict. Even more damagingly, increased militarisation—in the form of spending on weapons—and securitisation—as a form of dominance of security concerns over other social issues—have become distinguishing features of all.83 These factors, combined with the scarring of populations through death, injury, trauma, disability, the relocation of populations, devastation of basic infrastructures of life, and impairment of economic growth,
have led to a catastrophic slowing down or even reversal of development traction, with profound effects on health. In some cases, a complete breakdown of healthcare provision has occurred, leading to new therapeutic geographies of war. Evidence of a war-associated rise in birth defects in Iraq is an example of the more insidious effects of war. Another striking example is the excess infant mortality as a result of conflict, estimated to be 1%, and equivalent to all battle deaths, using mean durations of conflict.

Health, wellbeing, and survival

The shortcomings of PED policies in the Arab world have affected, individually and in combination, the health profile and burden of disease. A striking example is that the region has high rates of both child stunting and adult obesity (figure 7). Geographical distribution, with richer Arab countries accounting for much of obesity and poorer ones accounting for undernourishment, only partly explains this finding because, in some cases, rates are increasing in the same countries, even the same communities. Rather, food insecurity, with its many PED causes, can lead to both child undernourishment and adult obesity through lack of nutritional diversity. Similar consumption patterns in cities to those in the west lock populations into lifestyles characterised by high intakes of fats and carbohydrates and little physical activity, with a bigger effect on women (figure 7) because of their constrained mobility and restricted access to public space in the more conservative societies.

Extrapolating from nutritional problems, the aforementioned drivers are again, in various combinations and to different extents, important factors in other health disorders and risks (table 2). Equally typical of many of these problems is gender inequality.

The links between health, demographic change, environmental sustainability, and patterns of economic development have been widely documented in published work. The public’s health is negatively affected by environmental and development failures (eg, informal housing and employment lead to higher prevalence of water-borne diseases, poor reproductive health, and occupational injuries; table 2). Poor health outcomes in turn lead to slower human and social development, with effects on PED dynamics (eg, the burden of non-infectious diseases incurs a high cost as a percentage of GDP). This cycle is especially conspicuous in the legacies of war (Iraq, Sudan, occupied Palestinian territory, Lebanon, Syria, Libya), occupation (Iraq and occupied Palestinian territory), and economic sanctions (Iraq and Gaza Strip), which bring devastating health and environmental burdens, and a breakdown of institutional structures, all of which affect the potential for social and economic development.

How can PED dynamics be recognised by, and incorporated in, health practice? Ethnographic health research has shown repeatedly that patients’ accounts of their illnesses lend support to what Hamdy calls political aetiologies of disease—eg, pesticides contributing to male infertility in Egypt; war as a cause of male infertility in Lebanon; corruption, failure of the welfare state, and environmental pollution exacerbating kidney disease in Egypt; and Somali refugees blaming unemployment and unmet day-to-day needs for mental illness, rather than trauma. Lock and colleagues offer local biologies as a concept to emphasise several non-biomedical variables affecting health and, more importantly, developing better accounts of how place-specific social, institutional, and historical factors can modify the biological basis of disease. For such accounts to emerge, patient narratives, political dynamics, and historical context would need to become a stronger part of health research in the Arab world. This approach could, in turn, help health practitioners better understand the PED context of a particular health problem and identify the levels at which it can be tackled more effectively, especially when recurring dynamics are common to a host of health problems, such as primary health-care failures, social inequities, environmental pollution, vested interests, and state violence. The question, however, is whether current discursive practices, in relation to population, environment, development, and health, are conducive to the emergence of more holistic diagnoses.

Discourse on sustainable development

Population, environment, and development

The dominant discourse on population and environment emphasises population increase and overconsumption of resources as a problem, and development as a process of income growth. Consistent with this discourse, population policies have tended to focus on reduction of fertility and improvement of maternal health in relation to childbirth, rather than address reproductive health...
issues holistically. Various forms of environmental managerialism—the notion that environmental problems can be solved through better environmental management and policy—are taken to be the most effective response to environmental degradation. Positive health and environmental outcomes are still assumed to derive automatically from economic development, following the development histories of Europe and North America, despite increasing doubts about this theory.10,11 Some scholars have pointed out that the causes of environmental problems cannot always be addressed by environmental ministries and agencies12 and others have called for more integrative institutional arrangements that recognize the multi-dimensional nature of environmental problems.13,14 However, the environment in this discourse is essentially a depleting asset to be managed so as to protect it from growing populations. The more important implications of strategic development policies, and energy and resource extraction choices on the one hand, and local, non-governmental actions, choices, and responses on the other hand, are often overlooked. Politically, the discourse is produced and reinforced by asymmetric aid–donor relationships that mostly fund and sustain it, since it echoes the beliefs and opinions of international environmental and management industries. This discourse sits well with social and political authoritarianism in the region, restricting debate on strategic development issues, which are left in the hands of a small elite.

Two statistics show the kind of empirical reality that these discourses do not capture. Consistently, between 2001 and 2011, the Arab world ranked first for military expenditure as a percentage of GDP (5·5%, more than double the world’s mean of 2·5%; figure 8A) and second to last on total health expenditure as a percentage of GDP (4·2%, only just ahead of South Asia’s 4·1%, and at less than half the world’s 10%; figure 8A). The Arab world is the only region to spend more on armament than on health. Except for Tunisia, even countries whose health expenditure exceeds military expenditure (figure 8B) have ratios of health to military spending that are substantially lower than that for the world. Recent trends are more disturbing: trebling of US conventional weapon export agreements, from $21·4 billion in 2010 to $66·3 billion in 2011, is largely accounted for by an increase in Arab military spending, with purchases by the top five Arab importers—Saudi Arabia, United Arab Emirates, Egypt, Oman, and Algeria—amounting to $42·3 billion.12 Ironically, this figure is close to one and a half times the entire 2011 US foreign assistance budget of $30·7 billion.13

Aside from the direct effect of armaments on health and wellbeing when used, these data raise several questions that are cause for concern. Would even a small shift in public spending from military to health, education, and environmental protection have a far greater effect on sustainable development than the kind of actions generally advocated in the reports about sustainable development—ie, would a substantial injection of capital generate a whole new set of possibilities in these three sectors? To what extent do actual security threats justify the vast defence budgets and where should the line be drawn between different security and social priorities? What role does and should the military establishment in different Arab countries play in civilian life? Who should make those decisions, and who does make them? Are the

Panel 4: Population trends

The Arab world, although hardly homogeneous, has been undergoing remarkable demographic changes. Its population grew by about 3·7% during the past 60 years and is increasing at a rate of 2·1% yearly, well above that for the world of 1·6%.15 At this rate, the population of about 359 million is expected to double in about 35 years.

UN estimates show large disparities in population growth rates across countries. Most have fairly low to mean growth rates, with Lebanon, Morocco, and Tunisia growing at the lowest rate—about 1% per year. Some countries have high population growth rates, with Kuwait, Iraq, Jordan, and Yemen near 3% or more per year, and some Gulf Cooperation Council (GCC) countries (Bahrain, Qatar, United Arab Emirates) well above 3% per year.16 Changes in war-related displacements and regional and international migration account for recent fluctuations in these rates.

The Arab population has the following characteristics: a fairly high but rapidly declining fertility rate, declining and mostly low mortality rate, a young age structure, and substantial increases in the working-age population as a result of labour migration.17 The region underwent one of the fastest declines in fertility and mortality over the last two decades or so, although the poorer countries have shown slower declines. Total fertility varies greatly from below replacement level (about 1·9) in Lebanon and Tunisia to over 5·0 in Comoros, Somalia, and Yemen. Life expectancy at birth has increased by about 20 years since the 1960s, and some GCC countries (United Arab Emirates, Qatar) recorded 78 years or more on average.18 Such improvements are not uniform, and poorer countries (eg, Comoros, Somalia, Sudan, Yemen) still have fairly high mortality rates. The maternal mortality ratio in 2010 ranged from 7 (Qatar) to 32 (Oman) deaths per 100 000 livebirths in GCC countries; from 25 (Lebanon) to 100 (Morocco) in middle-income countries; and from 200 (Yemen, Djibouti) in low-income countries, reaching 510 in Mauritania, 730 in Sudan, and 1000 in Somalia. These figures show wide variations in maternal mortality across countries in the region, and a seemingly strong association between mortality levels and national income. With the exception of some GCC countries, maternal mortality ratio is an alarming indicator of women’s health in the Arab world.19

Likewise, substantial heterogeneity in the age–sex profile of countries is reported, owing to varying stages of demographic transition and labour migration. The population is fairly young with a median age of about 22 years, compared with a world median of 29 years. The proportion of children younger than 15 years varies widely—between less than 15% in Qatar to more than 40% in countries such as Iraq, occupied Palestinian territory, and Yemen. Until recently, the proportion of young people aged 15–24 years has been increasing, and it now stands at nearly 20%. Populations are starting to age, with Lebanon and Tunisia having about 15% of people aged 65 years and older in 2010.17 All GCC countries have large migrant populations, with three having more foreigners than nationals.20 The United Arab Emirates stands out as having the largest share of foreigners at 7·3 million compared with less than 1 million nationals.20 Most of the foreigners in these countries are men of working age (15–64 years), distorting the age–sex composition—eg, more than 80% of the population of Qatar is of working age.21

The region has the largest number of refugees in the world, and very high levels of displaced populations. The Palestinians are the largest and oldest group in the region: three countries (Jordan, occupied Palestinian territory, and Syria) have over 1·5 million refugees each, followed by Lebanon with more than 0·5 million.22
Panel 5: Development trends

Characterisation of development trends is challenging in view of the vast differences in both natural resource endowments and income per person. A series of UNDP reports on Arab human development has attempted to draw broad conclusions, arguing that Arab countries are richer than they are developed.34–38

Recent economic trends have not been positive. From 1980 to 2010, mean yearly growth of gross domestic product (GDP) was 3% and, on a per-person basis, 0·5%; the corresponding values in the rest of the developing countries in the world were 4·5% and 3%, respectively.39 The region is also highly dependent on imports and international migration. It has relied on European markets for its exports, and therefore has been affected by the onset of the economic crisis there.39

Development patterns have been distorted by a so-called resource curse whereby commodity sectors become inefficient and resources shift out of agriculture and industry to services; because of dependence on one or two strategic commodities, economies become affected by commodity price fluctuations.

Since the 19th century, the region has been highly penetrated by outside interests. Even the key resources exploited from the region—its position as a hub of international transport, and oil—have had highly political effects. The fact that no other world region contains states as dependent on economic rent as they are in the Arab world40 has entrenched an authoritarian bargain and a substantial lag between Arab countries and other regions in terms of participatory governance.39 As a result, growth dividends have become increasingly concentrated in the hands of the political and economic elite, with preferential access to crucial assets and resources.39

The result of such trends has been a political geography characterised by huge inequalities in wealth and resource endowments for large and densely populated regions, with the wealth from oil and gas confined to ministates consisting of small populations. Similar problems prevail in terms of water endowment, which is generally poor in the region with its high likelihood of drought. Population concentrations are largely downstream from the region’s main water sources, increasing the risk of acute environmental and food insecurity. Although 43% of the population is rural, agriculture—the primary economic activity—accounts for no more than 5·4% of GDP.37 Since the 19th century, a shift towards export agriculture at the expense of greater food security and food sovereignty has occurred.

Several countries, including Egypt under President Gamal Abdel Nasser, adopted policies of import-substitution industrialisation that entrenched a large and overdeveloped state sector in which state employment and subsidies provided guarantees of welfare and basic livelihoods. This approach resulted in expanded educational opportunities and health services, but created high levels of graduate and youth unemployment. Nasserism also legitimised high levels of expenditure on the military. The region as a whole benefits the military industries of the west allied to Arab autocratic governments. It inflicts, at the very least, hefty opportunity costs on the people of the region, with untold environmental, developmental, and health implications.

Analytical concepts for sustainability

If the discourse on sustainability and health needs to be broadened to incorporate the PED dynamics and their politics, how is this best accomplished? In this respect, critical examination of three methods and concepts often used in the literature would be useful.

The Drivers, Pressures, State, Impact, Responses (DPSIR) framework, used in modelling environment–society interactions, distinguishes between a hierarchy of factors according to their importance as drivers, pressures, or effects.136–138 DPSIR has been criticised for reducing complex relations, lacking scale and spatial and temporal dimensions, and devaluing local responses to environmental problems by emphasising reaction to effects rather than action on drivers.136–138 This dissonance becomes especially relevant after the popular movements in the region that are calling into question the relationship between state and citizen, precisely around issues of security and access to resources. To mimic DPSIR parlance, the Arab uprisings that began in 2010–11 are instances in which local action has the power to affect drivers and pressures, something the framework does not allow for.

The concept of security now appears regularly in the health and environmental literature. On the one hand, physical safety and human security are recognised as important determinants of health outcomes.139–141 On the other hand, the concept of security is deepened beyond state security and applied to other sectors to deal with environmental and health problems (hence the emergence of such concepts as environmental and health security);142 this relatively new usage of the concept is what we are concerned with here. The Arab Human Development Report143 has argued that this extension helps shift the focus from state to citizen security, which might be true. However, the concept can work in the opposite way. For example, the literature on environmental security, internationally and in the Arab
world, is framing environmental problems as national security issues, because water and land are usually seen as part of the territorial integrity of the state. Furthermore, approaches to health and environment are tarnished by the authoritarian connotation of the term security—not least because the official titles of the repressive agencies of Arab police states almost always carry the word security (or amn, in Arabic) in their names. This does not necessarily make the term security unusable, but certainly calls for caution in using it.

Finally, the concepts of vulnerability and resilience, used extensively in environmental research, evoke a richer texture of states and responses than does security; something tends to be either secure or insecure, but can have different degrees of vulnerability. The concepts arose from research traditions in natural disaster and famine, the former emphasising the physical component of risk and the latter focusing on its socioeconomic dimension and the differential access to resources. Although useful analytically, precisely because of this synthesis, the concepts are fraught with difficulties, challenging metrics, and an insufficiently consistent approach.

### Survival: towards new concepts

We argue that the concept of survival can be useful to identify and emphasise PED dynamics—along with their political background and health manifestations—that threaten ecological systems underlying Arab human settlements, hence questioning the existence of the social, economic, and cultural relations that make up the social texture of communities. By survival we mean the physical survival of a substantial proportion of a community’s members and the survival of its social texture and entitlements. Threats to survival, in this sense, generate extreme types of insecurity. Survival, as an analytical concept, is therefore more selective and more focused than the concept of security, and by calling for more urgency, it is more useful than security, at least in this sense. The concept can also help to correct the excessive emphasis on environmental managerialism and shift the debate towards strategic development choices.

The concept of survival has some risks too. The most obvious one is alarmism: the possibility that overly pessimistic prognoses are yielded by analyses using the concept, especially in view of the intrinsic uncertainty of projections of environmental trends, and such historical precedents as the notoriously inaccurate Malthusian predictions. More fundamentally, if survival is meant to draw attention to the urgent and existential nature of the problems that the region faces, two questions arise. First, whose survival is at stake? Clearly, the differential exposure to threats that communities and different individuals within a community have, and the different capacities they have to tackle them, should be recognised. Hence, in using the concept, the plight of the most susceptible individuals should be emphasised—i.e., victims of war and those who are socially, economically, and politically marginalised or excluded because of class, sex, ethnic origin, military occupation, state violence, or non-citizenship.

A second question is: what kind of survival are we looking for? At first reading, the term seems to favour sheer biological survival, or what Agamben calls bare life, over other qualities that make up the richer texture of life and wellbeing. However, we suggest a different

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**Table 1: Examples of population-environment-development dynamics around urbanisation, war, and migration at two different time scales**

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<thead>
<tr>
<th>Population</th>
<th>Environmental</th>
<th>Development</th>
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<td>War-driven exodus leading to loss of employment and loss of development gains, and an increase in environmental pressure in places of refugee, usually cities (eg, Iraqi refugees fleeing within Iraq and to other Arab countries)</td>
<td>Environmental event leading to economic ruin, loss of development gains, and displacement of people, usually towards cities (eg, Syria’s 2006-12 drought and its effect on the agricultural sector, food prices, and rural-urban migration)</td>
<td>War-triggered loss of employment leading to displacement and environmental pressure in places of destination (eg, Saudi Arabia expelling Yemeni workers in 1990)</td>
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Changes to the size and age structure of Arab families, especially in cities, leading to different economic survival strategies and patterns of environmental stress. Long-term depletion and increased salinity of groundwater reserves leading to a decline in the agricultural sector and faster urbanisation, projected sea-level rise in Qatar, United Arab Emirates, and Egypt and its effects on coastal populations and livelihoods. Withdrawal of agricultural subsidies and development of alternative employment leading to faster urbanisation and more environmental pressure in cities.

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**Figure 6: Projected change in total yearly household income in Yemen, 2010-50**

Change as a result of local and global effects of climate change (eg, flooding, loss of yields, and global rise in food prices), according to one model. Reproduced from Wiebelt and colleagues, by permission of the International Food Policy Research Institute.
Figure 7: Prevalence of moderate and severe child undernourishment and adult obesity in the Arab world
(A) Latest national estimates of moderate and severe child undernourishment according to height-to-age ratio in children younger than 5 years in Arab countries for which data were available, and in the USA and worldwide; data are from UNICEF.87–89 (B) Latest national estimates of age-standardised adult obesity for men and women in Arab countries for which data were available, and in the USA and worldwide; data are from the WHO global status report on non-communicable diseases 2010.90 oPt=occupied Palestinian territory.

interpretation of survival—offered by Fassin111 and partly inspired by narratives of South African patients with HIV/AIDS—that does not separate the biological body from its social manifestation and sees survival in terms of physiological life, affective life, and social life at once.112 As an analytical tool, survival is linked to other concepts that are intrinsically social or political in nature such as vulnerability, resilience, security, and precarity, the latter used by Butler113 to denote “that politically induced condition in which certain populations suffer from failing social and economic networks of support and become differentially exposed to injury, violence, and death.”114 In using survival in concert with other analytical methods, the most productive aspect of each can be drawn upon.

However, the concept of survival impels us to ask questions about the parameters and indicators that can best identify existential threats to communities, and the tipping points beyond which damaging processes become irreversible. It can shift the emphasis, where needed, towards early warning systems115,116 and, more broadly, can bring a temporal dimension to the analyses in a way that other more static concepts do not.

Regional cooperation for survival

The Arab world has a remarkable wealth of climatic zones, ecological systems, cultural and architectural heritage, religions, people, urban and rural traditions, and institutional and political histories. This diversity might yet turn out to be the most important asset the region has in tackling the formidable challenges we have discussed. Whether it does, depends on a choice that the region has to make collectively. This is a choice between, on the one hand, regional cooperation and ecological integration for the sake of survival and, on the other hand, war, sectarian divisions, mistrust, and little hope in the future.

The region stands to gain from cooperation.115,116 In principle, ecological integration enables more rational watershed management and more secure food and agricultural policies, and a mutually beneficial exchange of labour and energy. It is, at the very least, a way of building much needed flexibility in national policy choices. And it is precisely around water, food, labour, and energy that the imperative for ecological integration is most urgent and has the best chance of succeeding. War, however, accelerates a downward trend in the ability of ecosystems to support current and future populations. For example, for every 3 years of violent conflict, poverty reduction is slowed by 2.7% according to one estimate.117 The Arab world is in a quasipermanent state of conflict and the ecological disasters are already taking a toll on its most vulnerable populations. This situation requires the recognition that survival is at stake and investment in disaster preparedness—a task that is generally beyond the capacity of single nations—bringing up yet another imperative for cooperation around issues of survival.

Regional cooperation is of course not a universal solution. Some environmental resources such as water and food are tied up in networks beyond the Arab world, and closer cooperation between Arab countries does not preclude other regional and global forms of exchange. There are many obstacles to regional cooperation—political instability, mistrust, divergence in national histories, interests and trajectories, weak institutions, prospects of violent conflict, existing geopolitical alliances, and powerful global interests—and each case would have to be taken on its own merit. Regional cooperation is not a novel concept: regional groups in Europe, America, and Asia have emerged around common economic and ecological interests. The GCC is arguably one successful
form of institutionalised regional exchange in the Arab world, even if it only includes high-income countries.

A call for an ecologically based integration of the Arab world in the 21st century is based on a widely shared sense of destiny for the people of the region despite mounting regional differences; it does not require political unity or abolition of national borders. It is an invitation to capitalise on endowments at a regional level and to recognise that the ability to survive and prosper in a fast-changing world hinges on making the diversity work for the Arab world rather than against it. It is also based on a recognition that respect for diversity will help push Arab countries towards the reorganisation of state–society relationships on the basis of democratic norms—towards a reformulation and institutionalisation of this association in terms of citizenship. Nowadays, political decisions about, for example, the trade-offs between water and food security, military spending, and the human rights of populations under threat should no longer be made by a small, self-interested elite. Whether this bright version of the future happens or not depends of course on what populations of the Arab world do or do not do. But it also largely depends on whether global governance institutions that are truly democratic can be built, and whether powerful countries in the west are willing to build relationships with the Arab world that are not focused on narrow interests—energy and weapon sales. Initiatives such as the proposal to develop shared

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<td>Waterborne diseases</td>
<td>Rural-urban migration and overcrowded urban centres with poor infrastructure cause overexploitation of water resources, a decline in freshwater availability, intense competition between different uses, and water contamination that in turn leads to increases in the incidence of diarrhoea and other waterborne diseases.</td>
<td>Water shortages increase the use of wastewater in irrigation of vegetables, and heavy rain floods the wastewater system and contaminates water supplies in urban areas with poor infrastructure, hence increasing exposure to waterborne pathogens. Climate change creates or exacerbates water supply problems and water rationing, which increases exposure to waterborne pathogens in rural and urban areas and reduces food production, leading to more undernutrition, lower immunocompetence, lower resistance to infection and, as a result, more frequent and severe episodes of waterborne disease.</td>
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<td>Undernourishment</td>
<td>Population growth leads to more competition for food and water, more urban encroachment on agricultural land, reduction in available land per person, all contributing to less available and less diverse food, with resultant undernourishment for people with low income.</td>
<td>Depleting groundwater reserves and climate change lead to less rainfall, more frequent droughts, and sea-level rise, all of which reduce crops and available food to populations and cause substantial damage to rural livelihoods; the latter leads to faster rural-urban flux, less agricultural land, and more undernourishment in people with low income.</td>
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<tr>
<td>Reproductive health problems</td>
<td>Migration, especially from low-income rural areas to the outskirts of cities and slum areas, is leading to increased urban poverty and low-income urban environments (crowding, pollution, restricted water supply, and bad sanitation). People in developing countries living in urban areas with a low-income have been shown to have less access to reproductive health services and to have more reproductive morbidities than those with higher incomes living in urban areas.</td>
<td>Pollutants in the environment as a result of war lead to increasing male infertility, which increases out-of-pocket expenditures and interferes with reproductive choice, resulting in worse reproductive health outcomes.</td>
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<tr>
<td>Occupational health problems</td>
<td>People who have a low income, are unemployed, or are migrant workers often accept work in hazardous occupations with minimal safety standards. Child labour increases in overcrowded urban neighbourhoods with poor public schooling systems. Women in rural areas are overburdened with agricultural work in addition to housework and family rearing.</td>
<td>Workers in many formal and informal sectors in the Arab world have higher-than-average exposure to climate-related hazards such as heatwaves, sea-level rise, and spread of malaria. Outdoor workers (eg, traffic policemen, street sweepers) are at high risk of exposure to increased air pollution from traffic and electric generators.</td>
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<tr>
<td>Traffic injuries</td>
<td>Crowded cities with poor public transportation generate traffic congestion, overcrowded buses and trains, and restricted space for pedestrians and bikers, increasing the risk of traffic incidents and injuries. Imigrant children and children from low-income backgrounds working in the streets are at high risk of traffic injuries.</td>
<td>Adverse weather conditions (rain, dust storms) increase the rate of vehicle crashes (eg, flash floods in the Arab peninsula have been associated with traffic fatalities).</td>
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Table 2: Population-environment-development dynamics in selected health problems
renewable energy production and transmission between north Africa and Europe offer a glimpse of what a healthier version of this relationship might look like.157

Way forward
What can and should health professionals do? We suggest three possible sets of actions for health professionals—as public health practitioners, clinical providers, researchers, and activists (ordered to show increasing levels of outreach beyond the health sector).

First, the Lancet Series about health in the Arab world has pointed to specific actions towards good governance and accountability,84 prevention of avoidable ill health,131 strengthening of health systems, provision of universal health coverage,77 and addressing of the health effects of war.84 However, this agenda has not yet been considered seriously in public health discussions in the region and has not been integrated into public health work or education. We believe that health practitioners should engage with and push for change with this agenda. Additionally, some of these issues—effects of war, health systems, and health coverage—provide excellent platforms for regional collaboration in health research, education, and evidence-based policy. Building effective regional networks for the exchange of ideas and promotion of health agendas at regional levels would undoubtedly strengthen health advocacy and give advocates more legitimacy and negotiating power.

Second, health professionals can broaden the scope of their thinking about health to include population, environmental, and development issues that affect health. They can join in with professionals in those specialties to research, generate evidence, formulate measures, and engage with policy makers and the general public to change policy and practices around issues of common concern. For example, they can initiate or contribute to national and regional efforts to implement water and food policies that are sustainable, reduce militarisation and military budgets, increase spending on health and education, and fight sex and class inequities in access to environmental resources—all of which have major health implications that cannot be tackled by any sector alone, including the health sector. Multidisciplinary health research that is informed by an understanding of PED effects on health, including political, anthropological, and social science perspectives, is crucial in this regard. This kind of research, especially if it analyses and disseminates successful interventions and policy changes in several sectors, can build a powerful scientific foundation for multidisciplinary advocacy. Engagement with PED issues will also allow health professionals to feature the public health agenda more prominently in sustainability debates and forums, something that is lacking, except when the health effects of ecological deterioration are marshalled to make a case for environmental action. For example, the health case for low-carbon policies in the transport, housing, and energy sectors is compelling and yet often overlooked.198

Third, but not least, health practitioners can open up issues for public debate and mobilise support for action on ecological integration and sustainability as matters of vital importance for people’s daily subsistence, health, and survival. In international forums, they can affect international agendas and treaties around social and

Figure 8: Health and military expenditure as percentage of GDP in world regions and Arab countries
(A) 11-year mean (2001–11) of total health and military expenditure as a proportion of GDP (left-hand axis) and ratio of total health to military expenditure (right-hand axis), by world region and overall. (B) 11-year average mean (2001–11) of total health, public health, and military expenditure as a proportion of GDP for Arab countries for which data were available, and for Turkey, Iran, Israel (three non-Arab military powers in the Middle East), and the world for comparison. Data are from the World Bank WorldData database.131 GDP=gross domestic product. OECD=Organisation for Economic Cooperation and Development.
environmental problems—climate change, women’s rights, children’s rights, migrant labour, and poverty—over which Arab officialdom has often taken notoriously conservative stances. At local and national levels, they can use their professional capacity and professional platforms to contribute to new social contracts that aim to radically change the current relationship between citizens and government in the Arab world for the better. They can engage a broader public in building new institutions that are democratic, responsive to the needs of all their constituents and, most crucially, ones that view the rich endowments of the Arab world—ecological, social, and cultural—not as exclusive assets for a privileged few or a means to service world powers, but as pathways to human development, social justice, and wellbeing.

Conclusion
What future does the Arab world want? We must recognise and respect the fact that different populations of the Arab world might want different futures; however, the fundamentals of new state–citizen relationships, responsive and accountable institutions, and cooperation for the sake of survival are arguably common to all of these visions. This is possibly the most important message that the Arab world can contribute to the global debate on sustainable development goals. It is not a particularly new message, but it is as urgent as ever. This is the future the Arab world deserves, the one it ought to want, and the one that populations of the Arab world everywhere, one way or another, are already asking for.

Contributors
AE-Z, SJ, IN, and HZ conceptualised the report and, with BT and MK, contributed to the writing of the main text. AE-Z was the main contributor and led the writing, editing, and discussions around the paper. MK, HZ, TT, YM, JD, and NY wrote the panels as experts in their respective fields. All authors contributed to discussions and comments around successive drafts.

Conflicts of interest
We declare that we have no conflicts of interest.

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In the past 10 years, but especially since the desperate act by Mohamed Bouazizi (a 26-year-old street vendor who set himself on fire on Dec 17, 2010, in protest against the confiscation of his cart and his humiliation by police) sparked popular uprisings in Tunisia that toppled President Zine El Abidine Ben Ali in January, 2011, huge ongoing changes have gripped several countries in the Arab world and affected almost all others. From the invasion and occupation of Iraq to the empowerment of previously silenced masses (claiming new spaces for dissent, toppling presidents, and redrafting constitutions), the separation of South Sudan, and persistent insecurities and violence in some countries, these changes affect every domain of social life and have important effects on health. This Viewpoint discusses the nature of these effects and examines options for policy, practice, and international engagement to protect health during this period of rapid social change. In so doing, the Viewpoint takes stock of selected initiatives that show that professionals in the Arab world are actively taking advantage of opportunities for change, thus creating inspiration for the way forward for health.

Change is a major focus of the *Lancet* Series about health in the Arab world. The papers in this Series discuss the connection between political change and health from different angles. Tell1 provides a crucial introduction to the political history and economy that have shaped the region, along with public health and introduction to the political history and economy that have shaped the region, along with public health and health systems. Batniji and colleagues2 assess changes in health from different angles. Tell1 provides a crucial introduction to the political history and economy that have shaped the region, along with public health and introduction to the political history and economy that have shaped the region, along with public health and health status, and governance over three decades, whereas Saleh and colleagues3 explore the potential of universal health coverage in four Arab uprising countries. Dewachi and colleagues4 dissect how conflict has produced new landscapes of care, and El-Zein and colleagues5 examine environmental change and implications for health. No matter what angle is taken, contemporary changes profoundly affect health.

The focus on change is particularly important now as the net balance of change tips in the negative direction, and initial fascination with the Arab spring is replaced with disappointment and disengagement amid anticipation of a long Arab winter. The people who work in health in this region do not have the luxury of such disengagement. They need to find hope in the present mess and start to chart a path for the future, dim as the prospects might look now.

Many of the recent changes expose the failures of the state project in many of the Arab countries in the post-independence era in attaining sovereignty and security, building consensus (eg, for fundamental issues as the constitution, citizenship, and distribution of resources), protecting rights and dignity, and achieving long promised development (including in health status and health services) while ensuring inclusiveness and combating corruption.

The transformations in state and society are noticeable in health, most obviously where the change is tragic and bloody. Syria presents the most extreme example. Senseless killings, abject suffering, large-scale displacement, and unprecedented destruction are occurring every day on the streets of Syria. The health system is not exempt; facilities are being destroyed, services are collapsing, and workers are being targeted. In Syria, our common humanity and heritage are at stake. Allowing violence to continue—under international watch, on the premise that this conflict is a civil war in societies that are tribal, sectarian, or clanshadow—condemns people to pre-judgment and leaves them to what is presumed to be their unfortunate destiny. The present bloodshed in Syria devalues all people, not just those directly engulfed in it. This realisation contradicts the guilt-relieving notion that there is nothing to be done. In old Aleppo, an unassuming entrance hid one of the world’s most unique health treasures: Bimaristan (hospital) al-Argouni. Built in 1354 for people who were insane and mentally ill and partly destroyed in the recent fighting, al-Argouni was the first such hospital in the world. It soothed patients with a unique combination of quiet and music generated by musicians and a centre-yard fountain. This heritage is what humanity is losing.

Where change has been less violent and gradual, the effect on health depends on how competing visions of elected powers for state and society translate during transitions into policies with harmful or beneficial health effects. These political changes are now unfolding in several countries with mixed results at best.

With difficulties related to the Arab spring increasing, adding to many other challenges (eg, environmental degradation and scarcity, as described by El-Zein and colleagues6), projection of optimism might imply naivety. However, many developments signal change within and around the health landscape and hold promise for health.

The first promise comes from the very focus of this Series. Perhaps surprisingly, the Arab world has only recently emerged as a unit for analysis and as a legitimate subject for discussion in global health.7 Beyond its clear meaning for people within and outside the region, the term has been in long use in the social sciences. The international health literature, however, has predominantly used different terms or descriptors that include some but not all Arab countries. International and development organisations often use the terms eastern Mediterranean region, Middle East, north Africa, or western Asia, or a combination. PubMed lists “Arab world”, “Arab region”, and “Middle East” in the titles of 120, 13, and 1165 publications, respectively.
Although the use of descriptors might be the choice of the researchers and authors, in reality descriptors in international use are powerful and some of the reasons authors select them is to increase the likelihood of acceptance and access to funding. Beyond capture of the shared history, language, and culture of the region, the use of the term Arab world provides a platform for the promise of common action. With the remarkable diversity of countries in the Arab world, which paradoxically has some of the least developed countries and some of the richest countries, bridging of the large differences in health indicators between countries needs a framework that can motivate collective work within a scope of solidarity. Such a framework can assure a fast, efficient, appropriate, and sustainable process of improvement. This promise remains largely unfulfilled, and is a main challenge for the future.

Several initiatives with overlapping focus have been launched in the past few years to create platforms for dialogue and mobilise communities of researchers and practitioners. The Public Health in the Arab World initiative grew from a small regional and international community of researchers and practitioners that set out to write a book to address a gap in the global health scholarship, through focusing on the Arab world as the subject for analysis. The initiative includes an international listserv with a broad outreach beyond its membership of 1100 people, a regional resource portal, and many other activities that are still growing. The first Arab World Conference on Public Health, held in Dubai, United Arab Emirates, in April, 2013, was the first congress with such a focus. Organised with support from the World Federation of Public Health Associations, the conference attracted several hundred participants. A second event is planned, promising that this conference will become a regular international forum. These and other platforms have the potential to grow from communities of practice, focusing on a subject and a region, into communities of purpose that attempt to position a new (but still feeble) movement in service of the region, into communities of practice, focusing on a subject and a region, into communities of purpose that attempt to position a new (but still feeble) movement in service of the Arab world.

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For the Public Health in the Arab World initiative see http://www.phaw.org

For the Arab World Conference on Public Health see http://www.publichealthdubai.com

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Second, health and social gains should be safeguarded from threats during political transitions. These threats are plausible (on the basis of lessons from transition in some former Soviet bloc countries) and real. For example, because state structures under previous autocratic regimes were associated with hegemony, poor performance, and corruption, some people in post-uprising countries have called for reduction in state involvement in health and other social services, in favour of an increased role for grassroots organisations (many of which are affiliated with previously suppressed political parties that are now
in power). Similarly, some newly elected conservative governments have attempted to roll back pro-women reproductive policies. These developments are potentially dangerous, and can undermine the role of the state in securing of health rights and reverse previous gains for health. The international health community needs to work with local health professionals to expose and address these threats. This task needs vigilance, meticulous research, and tactical use of international health platforms to discourage ill-informed policies and promote pro-health ones.

Third, these promising initiatives need to be capitalised on. Many international institutions and professionals might find this aspect to be the most feasible for engagement. The overarching task is to support the new movement for health, with its emphasis on collective action and solidarity, to promote health across the Arab world.

Fourth, the global health agenda should address the unique health and development priorities of the Arab world. The discussions about the post-2015 development goals, including those relating to health, have not captured the need to address the continued legacy of colonialism, geopolitical meddling, and conflict in the region. If the political determinants of health are not addressed, there is little opportunity for major strides in the other determinants of health, let alone health problems.

This Series has added an important platform to debate the links between health and political change in the Arab world. Funding, initiatives, and collaborations to translate the findings and recommendations into policies and practice are needed. Such follow-up offers hope for improving health in the Arab world—the hope that has motivated this Series.

Conflicts of interest
I have participated in several initiatives described in this Viewpoint, including the Public Health in the Arab World initiative, the first Arab World Conference on Public Health, and the Bellagio meeting. I receive no personal royalties from the sales of the Public Health in the Arab World book.

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I am now a staff member at WHO. I alone am responsible for the views expressed in this publication and I do not necessarily represent the decisions or policies of WHO.

References
State formation and underdevelopment in the Arab world

Tariq Tell

A revisionist view of Arab underdevelopment has gained popularity because of the hegemony of neoliberal beliefs over development policy in the region. It stresses the inadequacies of the Arab state and the shortcomings of the dirigiste (state-led) development policies associated with so-called Arab socialism, and was given popular support by President Gamal Abdel Nasser of Egypt who dominated the politics of the Arab world from 1952 to 1970.1,2 Little effort has been made to understand the historical forces that produced this turn to the state, and an internalist explanation of the lack of Arab progress is offered instead. Developmental deficits—eg, in health, education, and culture—are attributed to failures of governance, stemming from the ability of rulers to buy loyalty from the opposition in exchange for economic privilege and social security.1

However, this explanation does not account for developmental failure in so diverse a region as the Arab world. Moreover, a focus solely on internal political economy ignores that the Arab region was, and remains, the most penetrated part of the non-European world. The region is a geopolitical hub because of its vast oil reserves and strategic location between the Mediterranean and western Asia; it was a site of imperial ambition and outside interference from the late 18th century. From the time of Napoleon’s invasion of Egypt in 1798, the weakness of the Ottoman Empire (which exerted various forms of control over the Arab lands east of Morocco from 1516 to 1918) allowed sustained colonial or neocolonial intervention in the region’s affairs. Since the collapse of the Ottoman Empire in the aftermath of World War I, the Arab world has been the site of near-continuous intrastate struggle and interstate warfare. In almost every case, these conflicts have been supported by external sponsors or great-power rivalries.4,5

In view of this long history of western encroachment on the region, the imperial origins of the Arab state system are a key determinant of the endowments and resources available for health and development. The legacies of colonial rule were also of key importance in both the establishment of authoritarian regimes and sustaining of the democratic deficit that is a conspicuous feature of politics in the region. Imperial interests were also important in the formation of indigenous resistance movements—whether in the form of military-led revolutions from above, or popular protests from below driven by local notions of justice—that forced despotic regimes to devote attention to their population’s health and welfare. This Essay offers a brief account of the association between imperial state formation and contemporary development in the region. It goes on to sketch the colonial legacies that continue to affect state building, together with factors such as governance structures and policy-making capacity, as elaborated in the first report of the Lancet Series about health in the Arab world.6,7

With a few exceptions (eg, Morocco, Oman, Saudi Arabia, and Yemen), state formation in the Arab Middle East was dependent on the dismemberment of the Ottoman Empire amid a maelstrom of war, famine, and ethnic cleansing in 1918–23.8-10 The resulting states are often described as fragile, but a more accurate view would be of an uneven political order, marked on the one hand by postimperial powers with established traditions of centralised rule and plausible aspirations to regional leadership (eg, Egypt, Iran, and Turkey), and on the other by so-called tribes with flags—artificial entities assembled from the frazzled communitarian identities (tribal, religious confessedional, and regional) of the Ottoman peripheries.11 Without the intrusion of western powers, these new states would have been reabsorbed into the previous imperial centres (Cairo, Tehran, or Istanbul). Instead, they survived under external protection, entrenching a regional order that split the region’s resource endowments in ways that could only constrain development. In particular, the newly discovered oil fields of the Persian Gulf were left under the control of what were in fact glorified chieftaincies, who lacked the skills or personnel needed to make effective use of the revenue from the oil. In practice, these states ended up siphoning their surplus cash into circuits of capital dominated by the UK and the USA—the powers that, over the course of the 20th century, ensured the survival of these regimes.12

Western imperialism bequeathed a problematic legacy even in the more advanced parts of the Arab world—ancient centres of settled civilisation with well developed administrative traditions and accumulated reserves of human, social, and cultural capital (eg, Egypt, Tunisia, Mount Lebanon, the Palestinian coast, and the great caravan cities of the Arab interior). The effects of western imperialism were greatest in French-colonial northwest Africa, where colonisation resulted in large-scale European settlement of the most fertile coastal plains (in the Algerian case, French rule even extended to annexation to the French hexagon). In Libya, Italian colonialism escalated into mass killings that all but destroyed the remnants of centralised government and administration left over from Ottoman rule. These events set the stage for a quintessential tribes-with-flags political order after Muammar Gaddafi overthrew the Sanusi monarchy and embarked on his Green Revolution in 1969.13 By then, the Rif region in Morocco had already been the site of a classic antiocolonial guerrilla war. In Algeria, a combination of land hunger, Islamic reform, and marginalisation of the Muslim majority launched what would become an emblematic war of national liberation and the template for armed liberation
movements in the southern part of the Arabian peninsula and occupied Palestinian territory.

In the Fertile Crescent, colonial power was notionally constrained by mandates from the League of Nations. Anticolonial uprisings (in Iraq in 1920, and in Syria in 1921–22 and 1923–27) combined with the menace of Wahhabism (a puritanical Islamic movement allied with what is now the ruling family of Saudi Arabia) along the desert frontiers to encourage the UK and France to commit to indirect rule. These countries promoted notables, soldiers, and administrators who were the main beneficiaries of the centralising late-Ottoman reforms known as the Tanzimat as the most appropriate instruments of colonial governance.” Following a model established by the British in Egypt during the late 19th century, colonial state building transformed these social groups into a class of large landowners. In Iraq and the Syrian interior, absentee urban landlords allied with a tribal aristocracy (now transformed into a quasi-feudal class) and financial elite enriched by the colonial connection (and often drawn from religious minorities). The result was a class of large landowners connected to the imperial powers. The domination of parliamentary politics by these so-called pashas, and their inability to distance themselves from their imperial patrons, quickly stripped the liberal democratic forms of rule left in place by the colonial powers of any popular legitimacy.14

The Mandatory regimes (British regimes in Iraq, Transjordan, and Palestine, and French regimes in Syria and Lebanon) restricted customary tribal law—which was a key element of indirect rule in British Africa and French Morocco under Hubert Lyautey—to isolated pockets such as the desert area in Transjordan or the Contrôle Bédouin in the Syrian steppe. In the Middle East, by contrast, communitarian colonialism took the form of a politics of the previous regimes (through nationalisations that expropriated from the colonial bourgeoisie, and land reforms that broke the power of pro-western landlords). For development, the record of the new dirigisme (state-led economic policies) was at best mixed; nationalisation led to the flight of both human and financial capital, even as import-substituting industrialisation failed to absorb the waves of migrants flooding into towns. For the Arab region as a whole, the breakup of the United Arab Republic (which briefly merged Syria and Egypt) in 1961 and Nasser’s defeat in the June War of 1967 highlighted the revolutionaries’ failure to achieve Arab unity or to liberate the occupied Palestinian territory. Nonetheless, the rivalries of the Arab Cold War forced the conservative states to adopt similar practices to ensure popular support. These practices opened up new opportunities for gain from work and welfare in Jordan and the Persian Gulf.19,20
The death of Nasser in 1970 and the petroleum price revolution that followed the 1973 October War brought a shift from ḥawra (revolution) to ḥawra (wealth), and the construction of a new Arab order based on flows of money from petroleum exports and labour remittances. Unemployed or underemployed people in Tunisia, the Nile Delta, and Bilad al-Sham (Greater Syria) migrated to areas of oil production; inter-Arab aid flows, increased at each of the Rabat (1974) and Baghdad (1979) Arab League summits, expanded state patronage and provided the means to co-opt a restless intelligentsia radicalised by Nasser’s example and alienated by Arab impotence in the face of Israel’s occupation of Palestinian territory. The new wealth also funded a web ofcronyism and corruption that enabled the rise of a state bourgeoisie. This nascent class invested in a remittance-driven infišah (economic opening) that cemented the reconfiguration of regional politics towards postpopulist authoritarianisms, and paved the way for market-driven liberalisation in the two decades that followed the Israeli–Egyptian peace treaty at Camp David in 1979.

The Nasserist social compact unraveled as a result of neoliberal restructuring, at the same time as the new Arab order eroded due to the tumbling oil prices and the financial drain of the Iran–Iraq War (1980–88). The tensions of adjustment were emphasised by a wave of austerity protests, beginning with bread riots in Egypt in 1976, and spreading with outbursts against the International Monetary Fund in north Africa and the rural hinterlands of Jordan in the 1980s and 1990s. Popular upheaval acquired a more overtly pan-Arab aspect with the outpouring of support for President Saddam Hussein of Iraq during the war over Kuwait (1990–91). As western armies gathered in the Arabian peninsula, the populations of the so-called poor Arab states made clear their resentment at the uneven distribution of the region’s wealth and their migrant compatriots’ lack of social or political rights in the oil states. In some ways, these patterns of popular contention were precursors of the mass mobilisations of the Arab spring. Rather than liberal revolts against despotism, these uprisings are increasingly seen to be an outcome of the region’s unequal distribution of resources and income in addition to the vulnerability of local livelihoods to the surge in prices as a consequence of the 2008 price hike in commodities.

The course of the Arab spring, with massive interventions by the North Atlantic Treaty Organization and the Gulf Cooperation Council in Libya and Syria, emphasises the limitations of a neoliberal orthodoxy focused solely on an internal process of state failure. This Essay has attempted a different approach, and has provided a historically informed account of the interplay between dependent development and state formation in the Arab region. An internalist focus on authoritarian rule and failures of governance provide proximate explanations, at best, for the Arab development deficit. A historical perspective helps to explain the depth of the Arab democratic deficit and the lack of responsive policy making for health in the region. Only through examination of the historically evolved structures that produced Arab authoritarianism—a long-standing pattern of western encroachment on the region, a divisive colonial legacy, and a process of state formation and state building conditioned by anticolonial populism—can a full accounting of the causes of the region’s failures in development and public health be achieved.

Conflicts of interest
I declare that I have no conflicts of interest.

References
A meeting of the Reproductive Health Working Group’s Consultative Committee was due to take place at the Faculty of Health Sciences, American University of Beirut, Beirut, Lebanon, on June 17–18, 2013. This Committee plans the activities of the Reproductive Health Working Group, Arab World and Turkey, a 25-year-old capacity-building research network for the Arab countries and Turkey. The Consultative Committee members are based in Egypt, Jordan, Lebanon, Oman, occupied Palestinian territory, Syria, Tunisia, and Turkey, where, with the exception of Oman, conflicts, wars, military occupation, insecurity, and uncertainty seem to be the norm these days.

With the exception of the two members who were hosting us in Beirut, and our Omani member who was not able to attend the meeting, we began our journey to Beirut. We had no idea when or whether any of us would arrive at the meeting, unlike in previous years when the political situation was the main restricting factor for individuals travelling from the occupied Palestinian territory and sometimes from Lebanon. The Turkish committee member had informed us on the previous day that she might have trouble getting to the airport because the prime minister of Turkey had called for a support rally in Istanbul. Demonstrations, spearheaded initially by young people, had erupted in central Istanbul and other urban areas against police violence, and an increasingly authoritarian stance of government. Watching the news from Turkey of people camping out in Taksim Square and Gezi Park, despite the hazards—including tear gas and water cannons—we felt like we were in Ramallah, West Bank, occupied Palestinian territory, or Cairo, Egypt, but not Istanbul.

The Tunisian member also was not sure about whether she would be able to get to Beirut. Tunisian security was continuing its operations in various parts of the country and there was the possibility of protests and strikes erupting suddenly. The unstable situation in Tunisia, where the Arab uprisings began, could make travel out of the country impossible. As for the Syrian member, she feared travelling through the checkpoint-ridden road from Damascus to Beirut; although it was possible to travel, no one could guarantee a safe journey. Although the Egyptian committee member seemed to have no difficulty with her journey to Beirut, she was constantly updated with news of possible serious protests by opponents and supporters of the Egyptian President Mohammed Morsi—which led to him being ousted from office on July 3, 2013. Of course, Beirut itself was not exactly a safe haven, with rockets hitting some districts a couple of weeks before our arrival, and the fears of a spill over from the war in Syria, which materialised in Sidon a few days after we arrived. Lebanon is unstable, security is unpredictable, and, so far, silently overwhelmed by hundreds of thousands of Syrian refugees. For once, it felt as if the West Bank was the safest place in the region.

After arriving, we first exchanged stories with each other, and then began working on planning for the next meeting in Oman in January, 2014; locations for previous meetings included Tunis (Tunisia), Beirut (Lebanon), Aleppo (Syria), Tyre (Lebanon), Istanbul (Turkey), Amman (Jordan), and Cairo (Egypt). The group reminisced bitterly about their 2009 meeting in Aleppo, with the frequent visits we made to the old souk, now a scene of intense fighting and devastation. There were many stories to tell, including horror stories from Damascus, which touch the heart and make you feel sick, such as enduring severe explosions very close to home and worrying about how to protect the elderly mother at home, or eye witnessing pieces of bodies thrown around all over after an attack.

There was the unusual story from Turkey about the standing man, an artist who challenged the violence of the authority by standing passively for many hours in Taksim Square despite orders to clear the place, and inspired hundreds of people to do the same; these events were described by the international media as Turks “giving the government the silent treatment.” There was also the Tunisian counter revolution and women were resisting the growing influence of social conservatism imposed on them. And all of us were especially concerned about erosion of basic rights and freedoms during violent social conflict and war, and that women’s rights seem to always be the first to go in such situations.

And then, we began to work, preparing for our meeting in Oman and exchanging information about recent research in the region. We discussed how we, an independent group of academics and researchers from the region, have managed to sustain a research network focused on knowledge production, capacity building, and working to influence policies and practices for more than 25 years. In our region, informed policy making is inadequate, not only because there is a crucial deficit in correct information, but also because policy development based on evidence is not usually part of our sociopolitical realities. Instead, we complete research under all conditions and include all relevant issues, and disseminate the results for use when the conditions allow in a process that can take time. Our experience shows that sometimes, perhaps often, policies change as a result of actual practices induced by the sometimes rapidly changing realities.
Our network is a flexible operation led by a part-time coordinator from the Faculty of Health Sciences, American University of Beirut, with support from the consultative committee and our wonderful administrator Noha Gaballah, and includes members from 14 countries in the region. The Reproductive Health Working Group is a multidisciplinary network, which includes anthropologists, economists, midwives, nurses, physicians, population scientists, public health specialists, sociologists, and a range of other specialties; most of the members are women. Our network operates very flexibly to ensure that we address and include diverse research and country needs, especially because the region is a volatile part of the world. These are regime-toppling times indeed.

Our main task is to produce and disseminate evidence to help to improve health and the operation of health services and systems in the region, focusing largely on reproductive health. In the process, special attention is being given to involve young researchers in the network, assisting them in formulating and undertaking locally relevant research, and encouraging the retention of young scholars in the region. The network provides a framework for mentoring and research support where we present our work to each other, from conceptualisation and development of research proposals to presentation of results. This forum is very useful for critiquing the results presented by researchers from different specialty backgrounds, in a warm and hospitable environment, and has proven to be instrumental in capacity building. Indeed, the number of young researchers who attend our meetings is increasing every year. So far, we have held 25 yearly meetings cumulatively attended by more than 1000 scholars, researchers, and graduate students, over the years. The proportion of young newcomers to the meetings has been increasing every year, and increased to 40% of the 48 participants at the previous year’s meeting in Tunis.

With time, we have been able to collectively develop more appropriate frameworks for conceptualising health in the region, based on our research and also our lived experiences, and have been developing measures that correspond to the new frameworks. These metrics include those that focus on the results of war and conflict on the wellbeing and mental health of survivors, such as human insecurity, distress, humiliation, and dignity, and adapting quality-of-life measures developed elsewhere to the local contexts.

Additionally, and above all, we have been able to support the publication of various articles in international scientific journals, showing analyses of reproductive health in the region from a within-region perspective, a view that we believe is often more appropriate and richer than an outsider’s view. In this way, we also address the problematic discourse and representations of the region reported in international literature, which fixate on Islam instead of key and determinant factors, especially the prevalence of patriarchal conservatism, or being engulfed by globalisation and its focus on free markets, profit, and private enterprise, which might be undermining people’s rights to health. We further address the ongoing presence of regional authoritarianism, which is believed to be supported by neocolonial western powers; how power can corrupt government when there is little systemic control and containment of what individuals who achieve power can do; and of course the region’s subjugation by and dependence on international and humanitarian aid, which dictates research and intervention agendas without sufficient regard to the relevance of international and western institutional health priorities and agendas to the region, among other important factors.

Although we recognise the primacy of the political context, our framework for understanding health and disease emphasises the social determinants of health as well. We grapple with, research, and write about topics such as poverty, migration, patriarchy, environmental degradation, and our social and cultural realities, which are affected by the political context of the region as a whole. All these influences on health are conceptualised as being autonomous and interdependent at the same time. The biological and social aspects of life are viewed as mutually constitutive, and health is understood as a quality of life that emerges from the ceaseless interactions between human beings and the physical, social, and political milieu in which they live. That is, we seek to understand and to document how the reproductive lives of men and women, during the life course, from birth to death, unfold within the matrix of local interactions between individual and environmental biology, culture, economy, and politics.

And so, in Beirut, we discussed and prepared the possible thematic agenda in very flexible ways so that we can accommodate as much of the ongoing research in the region as possible. We divided responsibilities, worked on ideas for upgrading our website, and began to think of new possible sources of funding to maintain this precious network. So far, we have been funded by various organisations, most importantly the Ford Foundation, Egypt, and currently, the International Development Research Centre, Ottawa, ON, Canada.

But then, as we went through the work we had to complete, we also marvelled at the research that continues in Syria, despite all the odds. From our own experience, perhaps the reason for the continued research is that during war and conflict, people need to maintain a semblance of normal life to preserve some sort of sanity despite the insane things happening around them, as was the case in the Lebanese civil war and still is in the occupied Palestinian territory. We want to ensure our network and other networks have greater importance not only in producing knowledge and mentoring the younger generation who will take over from us, but also for researchers to provide them with great support for each other. This support helps individuals to cope in times when the home front has become the battlefront.
Contributors
RG drafted the Essay. RG, AA-R, HB, JD, NG, AG, BT, and HZ contributed to the writing, editing, and reviewing of the final draft.

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