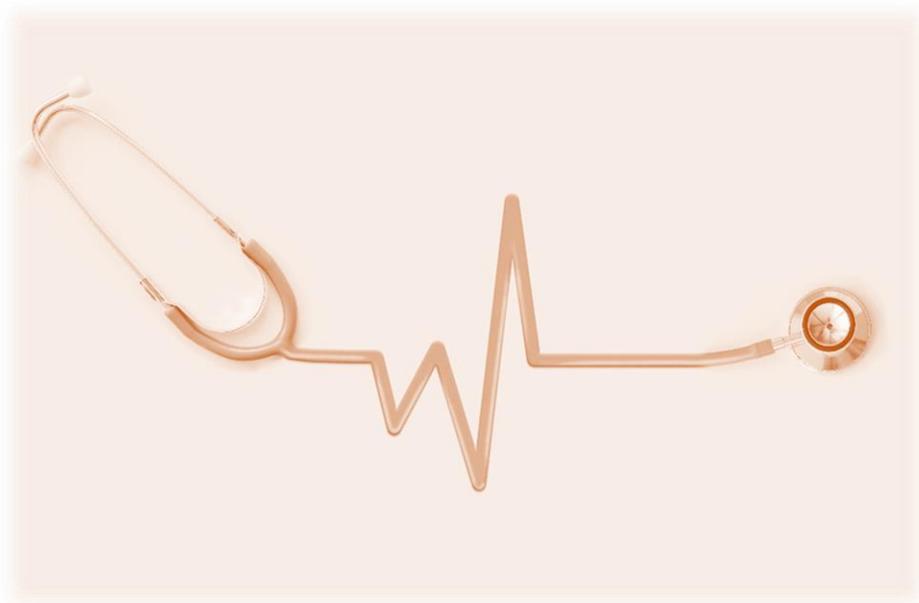




OIC HEALTH REPORT 2019



ORGANIZATION OF ISLAMIC COOPERATION
STATISTICAL, ECONOMIC AND SOCIAL RESEARCH
AND TRAINING CENTRE FOR ISLAMIC COUNTRIES



© November 2019 | Statistical, Economic and Social Research and Training Centre for Islamic Countries (SESRIC)

Kudüs Cad. No: 9, Diplomatik Site, 06450 Oran, Ankara –Turkey

Telephone +90–312–468 6172

Internet www.sesric.org

E-mail pubs@sesric.org

The material presented in this publication is copyrighted. The authors give the permission to view, copy, download, and print the material presented provided that these materials are not going to be reused, on whatsoever condition, for commercial purposes. For permission to reproduce or reprint any part of this publication, please send a request with complete information to the Publication Department of SESRIC.

All queries on rights and licenses should be addressed to the Publication Department, SESRIC, at the aforementioned address.

The responsibility for the content, the views, interpretations and conditions expressed herein rests solely with the authors and can in no way be taken to reflect the views of the SESRIC or its Member States, partners, or of the OIC.

ISBN: 978-975-6427-92-7

Cover design by Savaş Pehlivan Publication Department, SESRIC.

For additional information, contact Research Department, SESRIC through: research@sesric.org

CONTENTS

Contents.....	iii
Acronyms.....	vi
Preface.....	viii
Foreword.....	x
Acknowledgements.....	xii
Executive Summary.....	xiii
CHAPTER 1 – Introduction.....	1
CHAPTER 2 – Health Systems Strengthening.....	3
2.1 Health Expenditures and Financing.....	3
2.1.1 Health Expenditures Per Capita.....	3
2.1.2 Health Expenditures as Percent of GDP.....	5
2.1.3 Government Expenditures on Health.....	6
2.2 Financing of Health Care.....	8
2.3 Health Workforce.....	10
2.4 Healthcare Facilities.....	12
2.5 Hospital Beds.....	14
CHAPTER 3 – Disease Prevention and Control.....	16
3.1 Life Expectancy at Birth.....	17
3.2 Adult Mortality Rate.....	19
3.3 Causes of Death.....	21
3.4 Communicable Diseases.....	24



3.4.1	HIV/AIDS.....	24
3.4.2	Diarrhoea.....	26
3.4.3	Malaria.....	27
3.4.4	Pneumonia.....	28
3.4.5	Tuberculosis.....	29
3.4.6	Polio.....	31
3.5	Non-Communicable Diseases.....	31
3.5.1	Cardiovascular Diseases, Cancer, Diabetes and Chronic Respiratory Diseases.....	32
3.6	Risk Factors.....	35
3.6.1	Use of Alcohol.....	36
3.6.2	Tobacco Use.....	37
3.6.3	Insufficient Physical Activity.....	39
3.6.4	Obesity.....	40
CHAPTER 4 – Maternal, Newborn, and Child Health and Nutrition.....		43
4.1	Maternal Mortality.....	43
4.2	New-born and Child Mortality.....	45
4.3	Major Causes of Child Mortality.....	48
4.4	Maternal, New-born and Child Health Care Services.....	49
4.4.1	Antenatal Care.....	49
4.4.2	Births Attended by Skilled Health Personnel.....	50
4.4.3	Immunization.....	51
4.5	Prevention and Control of Infectious Diseases.....	53
4.6	Nutrition.....	56
4.6.1	Incidence of Malnutrition.....	56
4.6.2	Feeding Practices.....	58
4.7	Micronutrient Deficiencies.....	59
4.7.1	Vitamin A Supplement.....	59
4.7.2	Iodized Salt Consumption.....	60
4.7.3	Iron Deficiency Anaemia.....	62
CHAPTER 5 – Medicines, Vaccines, and Medical Technologies.....		64
5.1	Pharmaceutical Industry.....	64
5.1.1	Global Production and Consumption.....	65



5.1.2	Production and Consumption in OIC Countries	66
5.1.3	Availability of Essential and Generic Medicines	69
5.1.4	Pharmaceutical Trade	70
5.2	Vaccines	73
5.2.1	Production	74
5.2.2	Trade	75
5.3	Medical Technologies	76
5.3.1	Medical Device Market	76
5.3.2	Health Technology Policies	76
 CHAPTER 6 – Emergency Risk Management for Health.....		80
6.1	Need for Strengthening Health System Capacity	82
6.2	Assessment of Health System Capacities for Emergency Management.....	91
6.2.1	The Emergency Health System Framework	92
6.2.2	Assessment of Hospital Safety.....	93
6.2.3	Emergency Health Response Agencies and Regional Initiatives.....	94
6.3	Current Health Sector Situation in Conflict Affected Countries	95
 CHAPTER 7 – Information, Research, Education, and Advocacy		100
7.1	Health Education System	100
7.2	Quality of Health Education.....	102
7.3	Adverse Drug Reactions and Irrational Use of Medicines.....	105
7.4	Checks and Balances to Control Malpractices.....	107
7.5	Social and Cultural Issues related to Health Services.....	108
7.6	Public Health Awareness Schemes.....	111
 CHAPTER 8 – Concluding Remarks and Policy Recommendations.....		113
 Annex		121
Country Classifications.....		121
 REFERENCES		124

ACRONYMS

AMR	Adult Mortality Rate
ANCC	Antenatal Care Coverage
CDs	Communicable Diseases
CSHF	Comprehensive Safe Hospitals Framework
DRM	Disaster Risk Management
DTP	Diphtheria-Tetanus-Pertussis
EAP	East Asia and Pacific
ECA	Europe and Central Asia
EDRMH	Emergency and Disaster Risk Management for Health
EMS	Emergency Medical Services
EPI	Expanded Programme on Immunization
EWEC	Every Woman Every Child
FCTC	Framework Convention on Tobacco Control
HSI	Hospital Safety Index
ICHM	Islamic Conference of Health Ministers
ICIC	Islamic Committee of the International Crescent
IDP	Internally Displaced People
IFRC	International Federation of Red Cross and Red Crescent Societies
IHR	International Health Regulations
LAC	Latin America and the Caribbean
LEB	Life Expectancy at Birth
MDGs	Millennium Development Goals
SDGs	Sustainable Development Goals
MENA	Middle East and North Africa
MMR	Maternal Mortality Rate
NCDs	Non-Communicable Diseases
NRCS	National Red Cross and Red Crescent Societies
OIC	Organization of Islamic Cooperation
PAHO	Pan American Health Organization
SA	South Asia
SFEP	Strategic Framework for Emergency Preparedness
SSA	Sub-Saharan Africa



U5MR	Under 5 Mortality Rate
UNAIDS	The Joint United Nations Programme on HIV/AIDS
UNFPA	The United Nations Population Fund
UNICEF	The United Nations Children's Fund
WB	World Bank
WHO	World Health Organization



PREFACE

Recognising the central role of health in overall human development, socio-economic progress and poverty alleviation, the domain of health is one of the important areas of cooperation identified by the Member States of the Organization of Islamic Cooperation (OIC) under the OIC Ten Year Programme of Action adopted by the 3rd Extraordinary Summit Conference held on 8-9 December 2005 in Makkah Al-Mukarramah. This was further elaborated in the OIC-2025: Programme of Action adopted by the 13th Islamic Summit Conference held on 14-15 April 2016 in Istanbul.

OIC Member States have held six sessions of the Islamic Conference of Health Ministers (ICHM) and adopted the OIC Strategic Health Programme of Action (OIC-SHPA) 2014-2023 to address public health-related issues and challenges across the Islamic world.

In the last decade, many OIC Member States have paid special attention to the issue of health and development of modern and sustainable health systems by allocating more resources to the health sector than ever before. Consequently, these Member States have witnessed significant improvement in healthcare coverage, but the situation remains less promising in the least developed Member States, which are still lagging behind in primary health care coverage. This fact is particularly evident in South Asia and Sub-Saharan Africa, where healthcare systems are fragile due to insufficient financial resources; weak infrastructure; inadequate workforce; and slow progress in health sector reforms, resulting in significantly low access to health services.

As a basic principle, all people should have an equal right to access healthcare services irrespective of their social status and/or economic conditions. However, this principle does not hold true in the case of many OIC Member States where the greatest burden of disease is shouldered by the most vulnerable segments of society i.e. children and women



from the poorest communities, especially living in remote rural areas. Despite tangible improvement in healthcare systems and coverage, progress made by OIC Member States as a group in reducing maternal and child mortality is still very low. The evidence suggests that most of these deaths can be avoided, even by employing simple and cost-effective measures like antenatal check-ups, skilled birth attendance and immunization. We need to reconsider our current practices and adopt more pragmatic and result-based approaches that have proven effective elsewhere.

The OIC Health Report 2019 evaluates the recent state of health sector in OIC Member States, provides comparative analysis, and presents insights that can support the implementation of actions and activities recommended by the Islamic Conference of Health Ministers and OIC-SHPA. The report also identifies some major issues that require immediate attention both at national and intra-OIC level to expedite our progress towards attaining universal healthcare coverage.

I would like to thank the SESRIC research team for this well prepared report. I am confident that the issues and trends mentioned in the report will help in formulating future policies set to strengthen intra-OIC cooperation in the domain of health.

Dr. Yousef A. Al-Othaimeen
Secretary General
Organisation of Islamic Cooperation

FOREWORD

It is with great pleasure that I present to you the OIC Health Report 2019, which comes out at a time where we are halfway through implementing the OIC Strategic Health Programme of Action (OIC-SHPA) 2014-2023. This report thoroughly examines the health performance of OIC member countries by looking into the latest data and trends related to the six thematic areas of cooperation identified in the OIC-SHPA.

As the report indicates, it is important to recognize the noteworthy progress OIC countries have made over the years to ensure healthy lives and promoting the well-being of their populations. Since 1990, life expectancy at birth has increased by 5.5 years while child and maternal mortality rates are down by 52% and 42%, respectively. More than three quarters (77%) of children in OIC countries are immunized against fatal diseases. Since 2010, the incidence of communicable diseases - tuberculosis, diarrhea, and HIV/AIDS - is on decline whereas, mortality associated with cardiovascular diseases, cancer, diabetes and chronic respiratory diseases is in check. However, even with these positive health trends, the OIC group still tends to lag behind the performance of other country groups on many fronts.

A striking reality, which the report highlights, is the levels of resources OIC countries are devoting to the health sector. Health expenditures in OIC countries account for only 4.4% of GDP and 8.5% of total government spending in 2016. When we break this figure down even further, we find that the average per capita health spending of OIC countries at \$161 is 6 times lower than the world average and nearly 35 times lower than the average of developed countries. Furthermore, health expenditures continued to be financed through out of pocket spending in OIC countries with a lion share of 37.4% compared to 18.6% in the world and 13.5% in the developed countries.



The report also warns that the density of health workers in OIC countries, with only eight physicians and 18 nurses and midwives per 10,000 people, is well below the critical threshold of 34.5, which is considered necessary to deliver the basic health services in a country or region. With limited local production capacities and high dependence on imports, availability and affordability of essential medicines also remained a serious concern especially for the low-income OIC countries. Although there is a strong link between the level of information, education and advocacy and the health outcomes in a country or a region, the report finds that incorrect information and taboos about some health interventions like vaccines, hygiene and nutrition remained widespread in many parts of the Islamic world.

Perhaps the most disturbing finding of this report is about the catastrophic impacts of conflicts and natural disasters on the continuity and sustainability of healthcare systems in many OIC countries. Millions of people in these countries are forced out of their homes and do not have access to food, shelter and basic healthcare services. Finally, I would like to underline that the culmination of these positive and negative trends across the OIC countries calls for greater cooperation and collaboration to learn from each other's experiences and support the development of effective and efficient healthcare systems.

The OIC Health Report 2019 is the product of extensive time, effort and dedication undertaken by the staff of SESRIC. I would like to acknowledge their hard work and contributions with the anticipation that this report will provide new impetus for our joint efforts to improve the state of health in OIC countries.

Nebil DABUR
Director General
SESRIC

ACKNOWLEDGEMENTS

This report is prepared by a research team at SESRIC led by Mazhar Hussain and consisting of Cem Tintin, Kaan Namli and Tazeen Qureshi. The work was conducted under the leadership and supervision of H.E. Nebil Dabur, Director General of SESRIC.

Chapter one on Introduction, Chapter 2 on Health System Strengthening and Chapter 4 on Maternal, Newborn and Child Health and Nutrition were jointly prepared by Mazhar Hussain and Tazeen Qureshi. Chapter 3 on Disease Prevention and Control and Chapter 5 on Medicines, Vaccines and Medical Technologies were prepared by Cem Tintin. Chapter 6 on Emergency Risk Management for Health and Chapter 7 on Information, Research, Education and Advocacy were prepared by Kaan Namli. Tazeen Qureshi also helped in data visualisation and formatting of the report.



EXECUTIVE SUMMARY

Health System Strengthening

Health Expenditures and Healthcare Financing

Health financing is a critical component of health systems. It is mainly related with generation, allocation and use of financial resources to provide health care services to all people at a reasonable and affordable cost. Per capita health expenditure is an important indicator of consumption of health goods and services at the micro level. In 2016, average per capita total health expenditure in OIC countries amounted to US\$ 161. This contrasts unfavorably even with the corresponding figure for the non-OIC developing countries, which was US\$ 272. As percentage of their total GDP, spending on health in OIC countries was about 4.4% compared to 5.5% in non-OIC developing countries and 9.9% in the world. Overall, health expenditures accounted for only 8.5% of all government expenditures in OIC countries, compared to 26.1% in developed countries, 20.4% in the world and 9.3% in non-OIC developing countries.

Public financing covered 52% of total health expenditures in OIC countries compared to 74.2% in the world and 80.2% in developed countries. In general, the coverage of prepayment schemes, both public and private, remained very low in OIC countries whereas, 37.8% of total health expenditures were financed through out-of-pocket payments in these countries compared to 18.6% in the world and 13.5% in developed countries.

Health Workforce and Healthcare Facilities

Evidence suggests that there is a strong positive correlation between health workforce density and service coverage and health outcomes in a country/region. With only 8



physicians and 18 nurses and midwives, density of health workers in OIC countries (26 workers per 10,000 people) was recorded significantly below the critical threshold of 34.5, which is considered necessary to deliver the basic health services in a country/region.

On average, there were 6.7 health posts per 100,000 people in OIC countries; a level which is quite lower than the world average of 14.8 and the average of non-OIC developing countries (24.4). Similarly, the average number of health centers was reported at 2.1 per 100,000 people in OIC countries compared to 2.9 in the world. With an average of 0.9 hospitals per 100,000 people, OIC countries are also lagging behind the world and non-OIC developing countries averages (1.3 and 1.5, respectively) in terms of availability of district, provincial and specialized hospitals. Number of hospital beds is an important indicator of resources available for inpatient care and overall access to hospital services. In 2015, there were 13 hospitals per 10,000 people in OIC countries compared to 26 in non-OIC developing countries, 28 in the world and 56 in developed countries.

Disease Prevention and Control

Burden of Diseases

Prevention and control of diseases and pandemics is one of the most significant areas to be addressed in the domain of health. A look at the general trends in the cause-specific morbidity and mortality (i.e. prevalence of deaths due to communicable and non-communicable diseases, as well as injuries) reveals that in OIC countries non-communicable diseases caused 59.2% of all deaths in 2016. Each year increasing number of people dies from non-communicable dis (NCDs) in the OIC countries stemming from the positive trends seen in the risk factors (e.g. harmful use of alcohol and obesity). In OIC countries, communicable diseases were responsible for 29.6% of all deaths in 2016, which was far exceeding the average of non-OIC developing countries (23.7%) and the world average (22.3%). As the development levels of the OIC countries go up; NCDs become a more serious problem within the OIC group in general. However, a significant number of OIC countries continue to struggle with epidemics of communicable diseases, which are preventable.

Communicable and Non-Communicable Diseases

HIV/AIDS cases showed a downward trend in the OIC countries that went down from 1.5 in 2010 to 1.3 in 2017. The mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (per 100,000 population) was high in OIC countries, on average, that was measured at 20.9 in 2016 where the world average was 12.5 in the same year. These figures imply that many children and adult are at risk of dying due to diarrhoea that mainly stems from unclean drinking water and unhygienic sanitation. The total malaria



cases in some OIC countries are on the rise and as a result the share of OIC countries in the world in terms reported malaria cases climbed up from 50.8% in 2016 to 52.3% in 2017. In contrast, the incidence of tuberculosis went down from 132.3 (per 100,000 people) in 2010 to 113.7 in 2016 in OIC countries. An analysis on the mortalities caused by the NCDs displayed that mortality rates are on the decline. The mortality rate stemming from Cardiovascular Diseases (CVD), Cancer, Diabetes or Chronic Respiratory Diseases (CRD) went down from 24.3% in 2010 to 23.1% in 2016 for male population whereas for female population the rate decreased from 20.2% in 2010 to 19.0% in 2016.

Risk Factors

The harmful use of alcohol in OIC countries, on average, declined from 3.0 litres in 2010 to 2.8 litres in 2016. There exists also a negative trend in the prevalence of smoking in OIC countries where the average rate decreased from 20.2% in 2010 to 19.3% in 2016. Data showed that on average, the prevalence of insufficient physical activity in OIC countries was higher (28.8%) than the world average of 28.2% in 2016. As a natural result of insufficient physical activity and unhealthy diet, the prevalence of obesity, on average, increased from 15.2% in 2010 to 17.5% in 2016 in OIC countries. In particular, the prevalence rate of obesity seems to be relatively higher in some OIC countries located in the MENA region. The analysis on the risk factors over the period 2010-2016 reveals that OIC countries, on average, did well in some respects like reducing the harmful use of alcohol and smoking. Nevertheless, in some areas such as increasing the level of physical activity and coping with obesity, more efforts need to be exerted.

Maternal, Newborn and Child Health and Nutrition

Maternal and Child Mortality

Over the last two decades, many OIC countries have witnessed significant improvement in health care coverage and services and, consequently, they recorded declining trends in maternal, new-born and child mortality rates. According to the latest estimates, starting from a higher base rate of 559 deaths per 100,000 live births in 1990 OIC countries managed to reduce maternal mortality rate (MMR) by 42% to 326 deaths per 100,000 live births in 2015. Similarly, child mortality rate has also declined from 126 deaths per 1000 live births in 1990 to 60 per 1000 live births in 2015, corresponding to a decline of 52%. Nevertheless, despite this improvement, OIC group made the least progress in reducing maternal and child deaths since 1990. Maternal and child mortality has declined across the OIC regional groups, but Sub-Saharan Africa and South Asia remained the most difficult places for a mother and child to survive.

Major Causes of child Mortality

The major causes of under-five mortality in OIC countries are similar to those in other developing countries. In 2017, 37.8% of under-five deaths were caused by three infectious diseases: acute lower respiratory infections (19.2%), diarrhoea (10.5%) and malaria (8%). Among the pregnancy and birth related complications, prematurity (18.5%) remained the major cause of under five deaths followed by birth asphyxia (15%) and congenital anomalies (8.4%).

Health Care Coverage

Majority of maternal, new-born and child deaths are preventable through interventions like antenatal care, skilled attendance during birth, immunization, and early care seeking for infectious diseases. The provision of quality antenatal care remained a major concern in many OIC countries. During the period 2009-2018, around 64.5% of total pregnant women in OIC countries benefited from the recommended four antenatal checks up. The OIC average remained below the averages of the non-OIC developing countries and the world. A significant number of births in OIC countries are still taking place unassisted as only 69% of deliveries were assisted by a doctor, nurse or midwife in 2005-2017 compared to 84% in non-OIC developing countries and 80% in the world. DTP3 vaccination has increased in OIC countries from 67% to 77% between 2007 and 2017. The OIC coverage remained below the world (85%) and non-OIC developing countries average (89%).

Nutritional Status

Latest estimates show that about 31% of under-five children in OIC countries were stunted in 2010-2018 compared to 27% in other developing countries and in the world. During the same period, proportion of children under five years' old who were underweight was recorded at 19.9% in OIC countries compared to 19.2% in other developing countries. Wasting represents an acute form of under nutrition with heightened risk of disease and death for children. Wasting prevalence remained almost at par in OIC and other developing countries with a rate of 9.2% and 9.9%, respectively. Though overweight was once associated mainly with high-income countries, the number of overweight children under five has tripled between 2000 and 2018 in Eastern Europe and Central Asia. OIC countries accounted for about one third of the world total overweight children with an overweight prevalence rate of 5.4% compared to 4.9% in other developing countries.



Feeding Practices

Proper feeding especially during the first two years of life is critical for a child's survival, growth and development. The latest estimates on feeding practices reveal that in spite of its crucial importance for the nutritional status of children, a significant number of infants and children are not breastfed. In OIC countries, only 49.3% of infants were put to the breast within first hour of birth, and 36.9% were exclusively breastfed during the first six months of life compared to 52.8% and 40% in the world, respectively. The median coverage of breastfeeding until age 2 remained comparatively better in OIC countries with 63.1% of the total children breastfed until age 2. The estimates for appropriate feeding of children with adequate and safe complementary food reveal that 74.2% of infants in OIC countries were introduced to solid, semi-solid or soft foods at 6 to 8 months.

Micronutrient Deficiencies

Micronutrient deficiencies like deficiencies of vitamin A, iron, iodine, zinc and folic acid are very common among women and children in low income developing countries, including some OIC countries. Globally, nearly 64% of children aged 6 to 59 months received two doses of vitamin A in 2010-2017 while this ratio was recorded at 71% for OIC and 51% for non-OIC developing countries. During the same period, 77.1% of households in the OIC region were consuming salt with any iodine compared to 85.3% in non-OIC developing countries and 83.7% in the world. Iron deficiency anaemia also remained a major health challenge, affecting over 41% of under 5 children in the world in 2016. While prevalence of anaemia was just 11% for developed countries, the numbers were staggering in non-OIC developing and OIC countries with 41% and 50% of children suffering from anemia, respectively.

Medicines, Vaccines and Medical Technologies

Medicines and Vaccines

In 2018, OIC pharmaceutical exports valued at US\$ 1,191 billion compared to US\$ 628.7 million in 2010, corresponding to an increase of 89%. In general, OIC Pharmaceutical exports remained highly concentrated in Europe and Central Asia (ECA) and Middle East & North Africa (MENA) which accounted for 41.4% and 29.4% of OIC total exports respectively in 2018. On the other hand, OIC pharmaceutical imports have witnessed an upward trend and increased from US\$ 6.3 billion in 2012 to US\$ 9.2 billion in 2017. In 2018, it was measured at to US\$ 8.4 billion in 2018.

The median availability of selected generic medicines for public sector health ranged between 35% and 96.7% (with an overall average of 71.9%). Similarly, for the private

health sector, OIC countries represented a heterogeneous structure, with the median availability ranging from 57.8% to 96.7% (with an overall average of 77.6%). Vaccines production capacity also remained low across OIC countries. According to available data, OIC countries paid US\$ 2.95 billion on imports of vaccines in 2018.

Medical Technologies

In 2013/14, 23 out of 48 OIC countries (48%) have a health technology national policy. However, 25 countries (52%) do not have any. In the period of 2013-2014, 28 out of 47 OIC countries with the available data did not have any national list of approved medical devices of procurement or reimbursement in the country. On the other hand, in this period, 12 out of 47 OIC countries had a national list but it was only a recommendation. Computed Tomography (CT) scan units from the public and private sectors represent the highest density of medical devices among OIC countries with 144 CT per million populations.

Emergency Risk Management for Health

The range of emergencies faced by countries worldwide is highly diverse and wide-ranging, and includes various types of natural hazards, conflict, mass displacement, climate change, poverty and amongst others public health concerns. It is important to note the particularity of health with reference to emergencies. Nearly, if not all, emergencies effect the health of individuals. The global public health concerns that arise from emergencies include infectious disease outbreak, chemical and radiation contamination, disabilities, psychological problems and various other adverse health effects. During such emergencies, people are often cut from basic and essential care, life-saving medicines, proper infrastructure and medical supplies. Therefore, emergency risk management for health becomes an important element in decreasing the detrimental impacts of emergencies on individuals, communities and societies.

Most of the OIC Member States face a wide range of emergencies resulting from natural disasters, armed conflict and poverty amongst others. Often these emergencies have implications on OIC member countries' political, social, economic and public health structures. Whether they are due to natural disasters, conflicts, disease outbreaks or any other hazards, emergency crisis has serious implications on the healthy system of the OIC Member States. In this respect, this section highlights that the most critical challenge facing OIC Member States is strengthening their health systems to be more resilient and effective in dealing with emergencies.

Moreover, Chapter 6 highlights that the OIC Member States are diverse in many aspects including socio-economic status, development level, infrastructure and health. The



emergencies they face also show heterogeneity. While some OIC member countries are faced with natural disasters, others are engulfed in emergencies due to conflict and violence. OIC member countries account for 61.5% of all displaced people in the world with more than 25 million displaced people (SESRIC, 2017). Syria is at the centre of the one of the most serious humanitarian crises of the modern times. Likewise, natural disasters during the last four decades have witnessed a sharper upward trend inside the OIC member countries, significantly increasing from around 681 recorded incidents in the 1990s to 1,747 in the 2000-2016 period. This shows a rate of increase higher than that of the world average (SESRIC, 2017). Along with major socio-economic costs from these conflicts and disasters, people across the OIC member countries are facing major health limitations and shortages during emergencies.

Even though each emergency is different, its health sector vulnerabilities share many similarities. By integrating common disaster management methods and policies regarding the health system, resilience of communities and the health system can be fortified. It remains a challenge for OIC Member States to move away from response and recovery to prevention and mitigation in their health systems. It is important to mention that some OIC member countries have made progress in managing disaster risks and their health responses. Yet, the health capacities of OIC member countries show extreme diversity. The ongoing conflicts, lack of funding in health systems, limited access to resources and technology amongst others are the major factors affecting OIC member countries ability to develop their capacities.

Information, Research, Education and Advocacy

Health Education System

There is a strong link between the level of information, education and advocacy and the health outcomes in a country. Research established that many of the health concerns including diseases can be prevented by providing accurate and relevant information and education to the public, patients and health care providers. In this sense, information, education and advocacy are all complementary to each other. There are many health concerns that require accurate information to be given to the public and the health care providers for them to be able to make healthy choices. Moreover, health information and education has recently started to evolve into health promotion and advocacy. Therefore, there is a move toward prevention and pre-cautious information, education and advocacy. The other element is having the right information and education for diagnosis and healing processes, which can save millions of lives around the world and in the OIC region. Against this backdrop, this section examined information, research, education and advocacy as it relates to health.

Health Education System

Health education is a vital component of the health system. Without the proper health education, a huge burden is placed on countries in terms of economic costs, health of individuals and society and the deepening of health issues. For example, scientific studies suggest that there is a huge disease burden in African countries because of the lack of health education. Therefore, health education is a salient issue of concern for individuals, communities, governments and society as a whole. The aim of health education is to provide accurate and up to date information to wide range of actors including individuals, families, communities and health care providers. It aims to expand knowledge, raise awareness and provide the right skills and attitudes for individuals to make healthy choices.

Data on the number of health related schools and training institutions is very scarce across the globe. According to the latest available data from the WHO's World Health Report (2006), globally there are 2420 medical schools, 467 schools or departments of public health, and an indeterminate number of postsecondary nursing educational institutions in 169 countries. These schools and institutions train about one million new doctors, nurses, midwives, and public health professionals every year. Out of the top 20 active medical schools in the world, four of them are OIC member countries. These are Iran with 48 medical schools, Turkey with 37, Pakistan with 34 and Indonesia with 32, accounting for 2.5%, 1.9%, 1.8% and 1.7% of the total world shares respectively. There was only one active medical school in Guinea Bissau, Gabon and Surinam from the OIC countries.

The discussion in this section reveals that the health education institutions across the OIC member countries are weaker when compared to their counterparts. It becomes evident that more needs to be done across the OIC to establish health educational facilities. With the world's youngest population, the OIC member countries need to provide educational facilities that are needed for young people to pursue education in the medical field. It is not enough providing an educational institution but there also needs to be other facilities to complement it such as laboratories, testing equipment and relevant technological apparatuses. Along with educational institutions, the quality of health education makes up an important part of the health education system.

Quality of Health Education

Quality of health education directly affects health outcomes. Education is critical to social and economic development and has profound impacts on population health. Medical education will certainly affect practice patterns and influence career choices, thereby having a distributed net effect on population health, especially in underdeveloped



regions or those countries where relatively few practitioners are being trained. A major transformative opportunity for improving health among diverse communities worldwide is to reform the vision, programmes, and systems of educational institutions to train health professionals who can meet people's needs, empower communities, and enhance human wellbeing.

Over four million people worldwide lack access to quality health services, in large part because of a huge shortage, imbalanced skill mix, and uneven geographical distribution of health workers. WHO estimates that an additional 4.3 million health workers are needed worldwide. The health workforce crisis has disastrous implications for the health and well-being of millions of people, yet not enough health workers are being produced to close this shortfall. Scaling up educational programs to produce multi-disciplinary service delivery teams - which include a carefully balanced mix of clinicians, community health workers and health managers - is clearly urgent and essential especially across the OIC. However, simply increasing the numbers of workers will not be enough. The shortage of health workers is compounded by the fact that their skills, competencies, clinical experience, and expectations are often poorly suited to the health needs of the populations they serve (WHO, 2017). Therefore, as highlighted in this section, the need for quality health education is a necessary component of health systems.

Public Awareness and Health

Public health is the science of protecting and improving the health of families and communities through promotion of healthy lifestyles, research for disease and injury prevention and detection and control of infectious diseases. Overall, public health is concerned with protecting the health of entire populations. These populations can be as small as a local neighbourhood can, or as big as an entire country or region of the world. Public health professionals try to prevent problems from happening or recurring through implementing educational programs, recommending policies, administering services and conducting research – in contrast to clinical professionals like doctors and nurses, who focus primarily on treating individuals after they become sick or injured. Public health also works to limit health disparities. A large part of public health is promoting healthcare equity, quality and accessibility.

The importance of public awareness to have healthy societies is well acknowledged. According to the WHO, majority of heart diseases, strokes, Type 2 diabetes and cancer cases could be prevented just by educating and informing people about healthy diets, physical activity/exercise and harmful impact of tobacco use. Like their developing counterparts, many OIC countries are suffering from poor levels of health information and awareness. The situation is particularly critical in low-income countries where many myths and taboos prevail, which lead to the low usage of health care services that are

critical for the healthy survival of people. As highlighted in this section, OIC member countries need to increase their formal and informal public health awareness schemes to inform people about healthy lifestyles, choices and living. Public awareness on health could be raised by using digital media, awareness campaigns by influential people and educational material designed for the public.



CHAPTER 1

Introduction

Health is a crucial factor in the well-being of humanity. It has important contributions to economic progress since healthy people live longer and are more productive. Many and diverse factors influence health status and a country's ability to provide quality health services for its people. Ministries of health play a key role for the provision of health services; however, government agencies, donor institutions, and civil society organizations also contribute to the overall functioning of the health sector.

Over the recent decades, the issue of health has gained greater importance as a major driver of socio-economic progress around the globe, with more resources than ever being invested in this sector. Looking broadly, today people are healthier, wealthier and live longer than 50 years ago. Since 1990, OIC member countries witnessed significant improvement in mother and child health with 44% and 52% decline in mortality rates, respectively. However, despite this remarkable progress, OIC countries as a group made the least gains in reducing maternal and child deaths since 1990.

People living in many OIC countries, especially in South Asia and Sub-Saharan Africa regions, are still suffering from poor health care services mainly due to the lack of adequate and sustainable financial resources, poor health infrastructure and insufficient trained health workforce. The nature and magnitude of these key challenges require a greater commitment from the governments to put health sector higher on the national development agendas, build health infrastructure, and train workforce to meet the current and future demands for the health services. In this regard, the OIC Strategic Health Programme of Action (OIC-SHPA) 2014-2023, which has been prepared by SESRIC in collaboration with OIC countries and relevant international organizations, and adopted by the 4th Islamic Conference of Health Ministers, could play a key role by strengthening and enhancing the cooperation and collaboration on various health issues in OIC countries.



Against this background, this report looks at the state of health in OIC countries in a comparative perspective. To set the stage, Section 2 of the report evaluates the performance of health systems in OIC countries by underlining some of the most important building blocks like health expenditures and financing, health workforce and health infrastructure. Recent trends in prevalence of communicable and non-communicable diseases, their death burden and progress towards addressing major risk factors are being discussed and analyzed in Section 3. Section 4 discusses the current status of maternal, newborn and child health and nutrition by highlighting the current maternal and child mortality trends vis-à-vis implementation of WHO recommended interventions like antenatal checks-up, vaccination, skilled attendance of delivery, and breastfeeding etc. to curtail the MNC mortality and malnutrition. Section 5 elaborates on the status of medicines, vaccines and medical technologies production and procurement mechanisms in OIC countries along with the availability of essential medicines. Section 6 highlights the current resources and capacities for emergency health response and interventions in OIC countries along with some common gaps in the humanitarian health sector response related with information management and analysis, strategic planning and coordination and service delivery. Section 7 focuses on the linkages between level of information, education and advocacy and health outcomes in OIC countries by investigating the quality of health education and level of awareness about adverse drug reactions and irrational use of medicines. The main findings of the report are summarized in Section 8. The report concludes with policy recommendations aiming to enhance the implementation of interventions at both national and intra-OIC and international cooperation level to improve the state of health in OIC countries.



CHAPTER 2

Health Systems Strengthening

According to the definition of World Health Organization (WHO), a health system is the sum totals of all the organizations, institutions and resources, which are available with the primary purpose of improving the state of health. A well-functioning health system paves the way for a healthy population, healthy society and healthy economy. In order to deliver, however, health system requires robust financing mechanism, a well-trained and adequately paid workforce, reliable information on which to base decisions and policies, well-maintained facilities and logistics to deliver quality medicines and technologies (WHO, 2014). In general, health system strengthening encompasses all those actions, activities and measures that aim to improve the situation regarding aforementioned building blocks of health system in a country/region. In the light of this understanding, this section evaluates the performance of the health systems in OIC countries in terms of health financing, workforce and infrastructure.

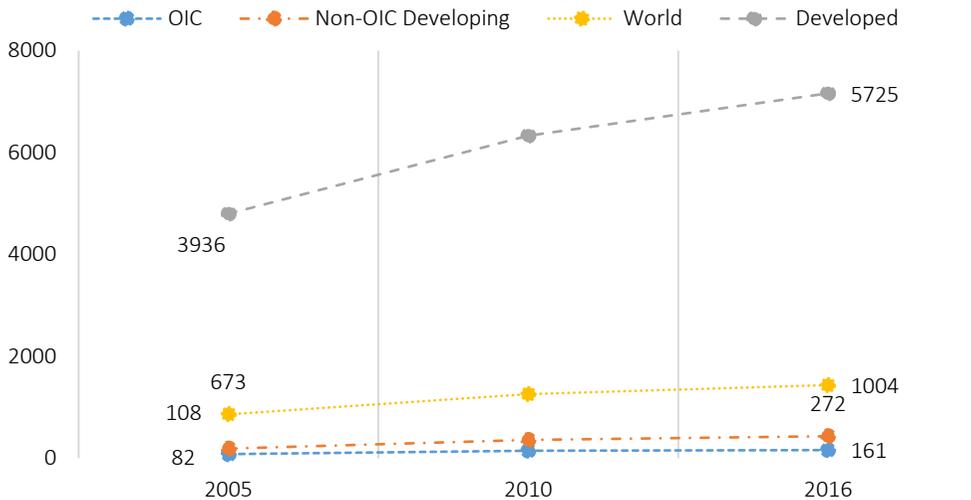
2.1 Health Expenditures and Financing

2.1.1 Health Expenditures Per Capita

Per capita total expenditure on health is an important indicator that indicates consumption of health goods and services at the micro level. As shown in Figure 2.1, per capita total health expenditures (in terms of current US dollars) have increased across the world between 2005 and 2016. In 2016, the per capita total health expenditure in the OIC countries amounted to US\$ 161. This contrasts unfavourably even with the corresponding figure for the Non-OIC developing countries, which was US\$ 272. Per capita expenditure on health reported by the developed countries was approximately 35 times higher than the OIC average in 2016. However, it is worth noting that the per capita health spending in the OIC countries as a group doubled in 2016 from its level of US\$ 82 in 2005.



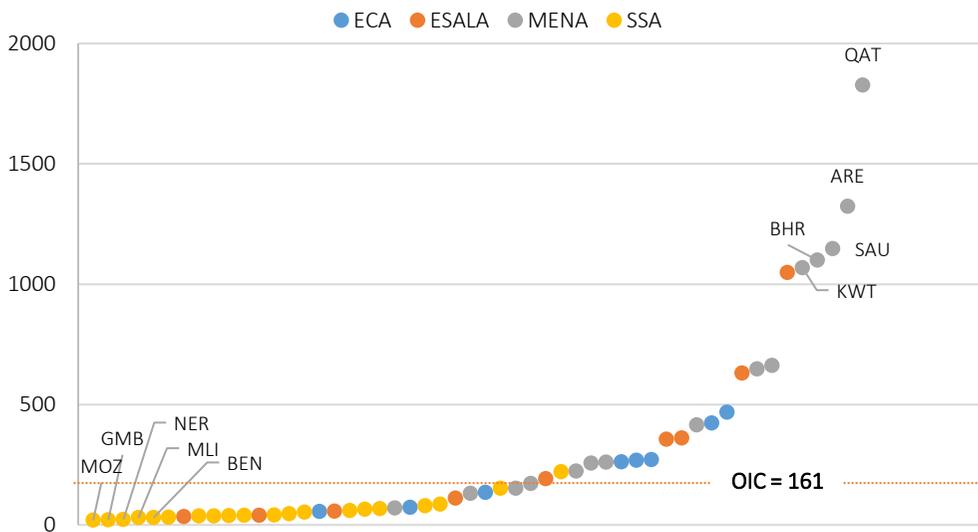
Figure 2.1: Comparison of Health Expenditure per capita (current US\$) (2005-2016)



Source: SESRIC staff calculations based on World Health Organization Data Repository

Much variation in health spending levels can be observed in OIC countries (Figure 2.2), ranging from Qatar with a total health spending per capita of US\$ 1827.1 to Mozambique with spending of only US\$ 19.2. In general, per capita health expenditures remained highest in OIC countries from MENA region. Among these countries, Qatar reported the highest per capita total health expenditures followed by United Arab Emirates and Saudi Arabia. On the other

Figure 2.2: OIC Countries with Highest and Lowest per Capita Health Expenditures, 2016



Source: World Health Organization Data Repository



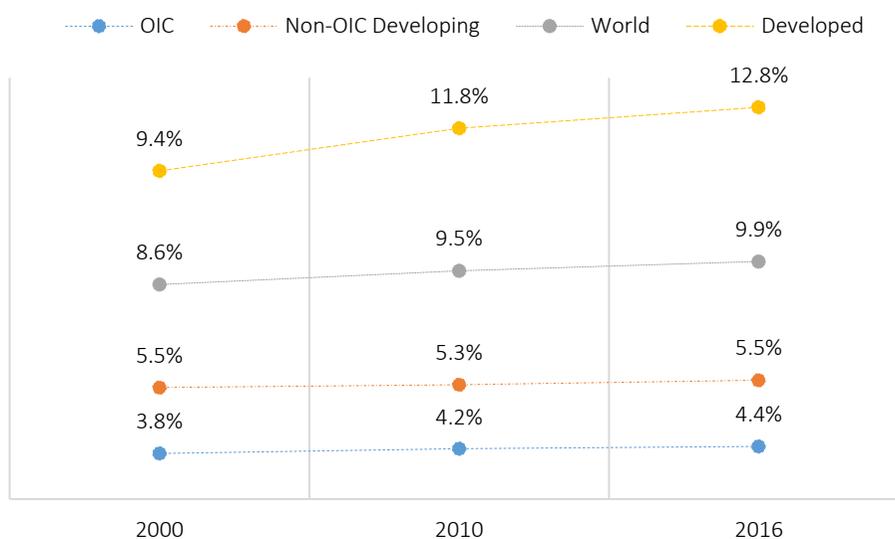
hand, majority of the OIC countries in Sub-Saharan Africa region were ranked among the worst performing countries. The situation remained particularly critical in Mozambique, Gambia, Niger, Mali, and Benin, with per capita health spending less than US\$ 40. In 2014, per capita expenditure on health remained below the OIC average for 55.7% of countries with data.

2.1.2 Health Expenditures as Percent of GDP

The latest estimates show that the world spent a total of US\$ 7.5 trillion on health care in 2016. The geographical distribution of financial resources for health is uneven and global health spending remained highly concentrated in developed countries. Health spending remained a major concern in OIC countries. As shown in Figure 2.3, the total expenditure on health in OIC countries was about 4.4% of the GDP in 2016 compared to 5.5% in non-OIC developing countries. This is also far below the global and developed countries averages of 9.9% and 12.8% respectively. Between 2000 and 2016, the share of GDP allocated to health increased by less than one percentage points in OIC countries. During the same period, developed countries reported an increase of 3.4 percentage points (Figure 2.3).

In majority of OIC countries with data, total health expenditure accounted for more than 5% of GDP. As shown in Figure 2.4, Sierra Leone is the top health spenders with 17% of GDP dedicated for health. All the top-5 spenders are low income countries except Maldives, Iran, and Lebanon which are higher-income countries. On the opposite side of the scale, health expenditures accounted for only 2.3% of GDP in Brunei Darussalam followed by Bangladesh

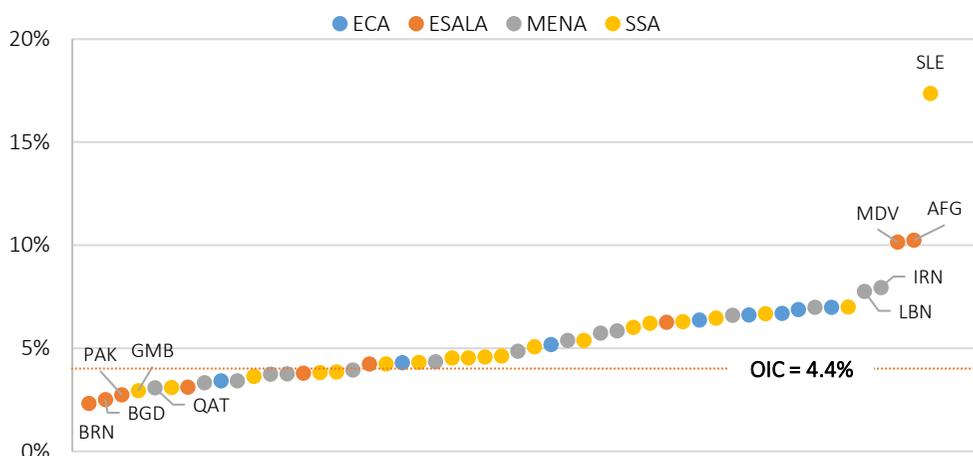
Figure 2.3: Comparison of Health Expenditure as a percentage of GDP (2000-2016)



Source: SESRIC staff calculations based on World Health Organization Data Repository

(2.5%). As per the data available, between 2000 and 2016, share of health expenditures in GDP increased in 28 OIC countries, ranging from 0.01 percentage points increase in Gabon to over 3 percentage point increase in Azerbaijan, Algeria, Iran, Togo and Burkina Faso. Meanwhile, it declined between 0.1 to 5.3 percentage points in 22 OIC countries. Turkmenistan and Jordan reported the highest decline of over 4 percentage points followed by the Lebanon with a decrease of 2.9 percentage points.

Figure 2.4: OIC Countries with Lowest and Highest Share of Health Expenditures in GDP, 2016



Source: SESRIC staff calculations based on World Health Organization Data Repository

2.1.3 Government Expenditures on Health

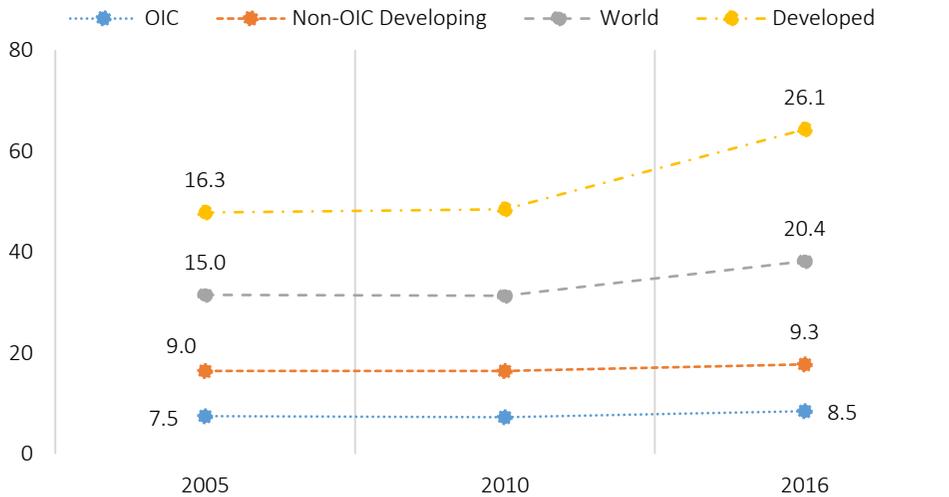
The share of government health expenditures in its total spending is an important indicator on the relative importance of the health sector in the national development agenda and, thus, the extent of the government financial support for the health system. As depicted in Figure 2.5, government spending on health in OIC countries was only 8.5% of total government expenditures in 2016, compared to 26.1% in developed countries, 20.4% in the world and 9.3% in non-OIC developing countries. Low share of health spending in the budgets of OIC countries is not merely due to public financial constraints but is also due to low priority given to health sector. Between 2005 and 2016, the share of total government expenditures allocated to health increased only by 1% in OIC countries, while it increased by 5.4 percentage points in the world (Figure 2.5). During the same period, developed countries reported an increase of 9.8 percentage points.

At the individual country level, 11 OIC countries allocated more than 10% of their national budgets for the health sector in 2016. Among these countries, Iran, Maldives, and Suriname reported the highest figures of 22.5%, 20.1% and 16.5%, respectively (Figure 2.6). On the opposite side of the scale, 14 OIC countries allocated less than 5% of their total budgets for the health sector in 2016. Among these countries, Iraq and Afghanistan reported the lowest



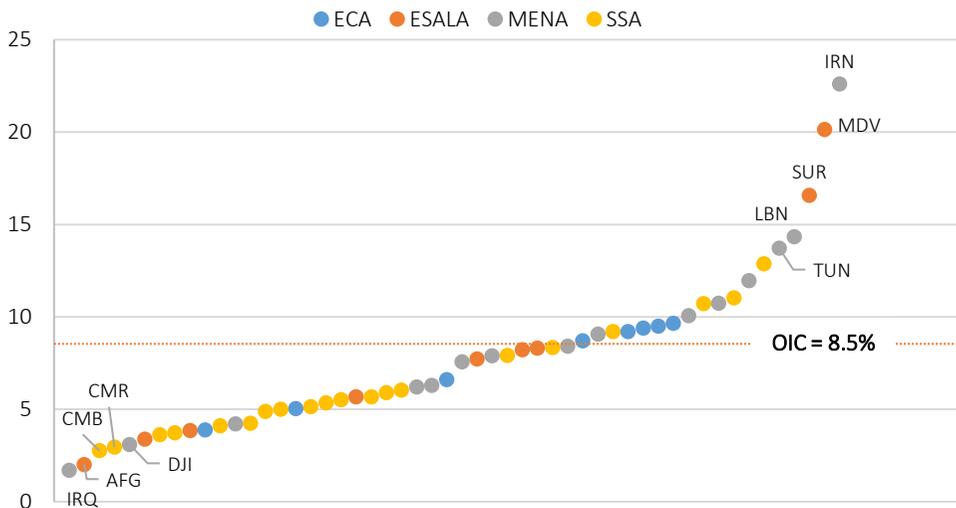
shares of 1.6% and 2%, respectively followed by Gambia (2.7%) and Cameroon (2.9%). As per the data available, between 2005 and 2016, share of health expenditures in government spending has increased in 23 OIC countries, ranging from 0.1 percentage points increase in Pakistan to 13.2 percentage points increase in Iran. Meanwhile, it declined between 0.03 to 9.7 percentage points in 28 OIC countries, with Uganda and Mozambique reporting the highest decline of 9.7 and 7.5 percentage points, respectively.

Figure 2.5: Share of Health Expenditure in Government Total Expenditure (2005-2016)



Source: SESRIC staff calculations based on World Health Organization Data Repository

Figure 2.6: OIC Countries with Highest and Lowest Share of Health in Budget, 2016



Source: World Health Organization Data Repository

2.2 Financing of Health Care

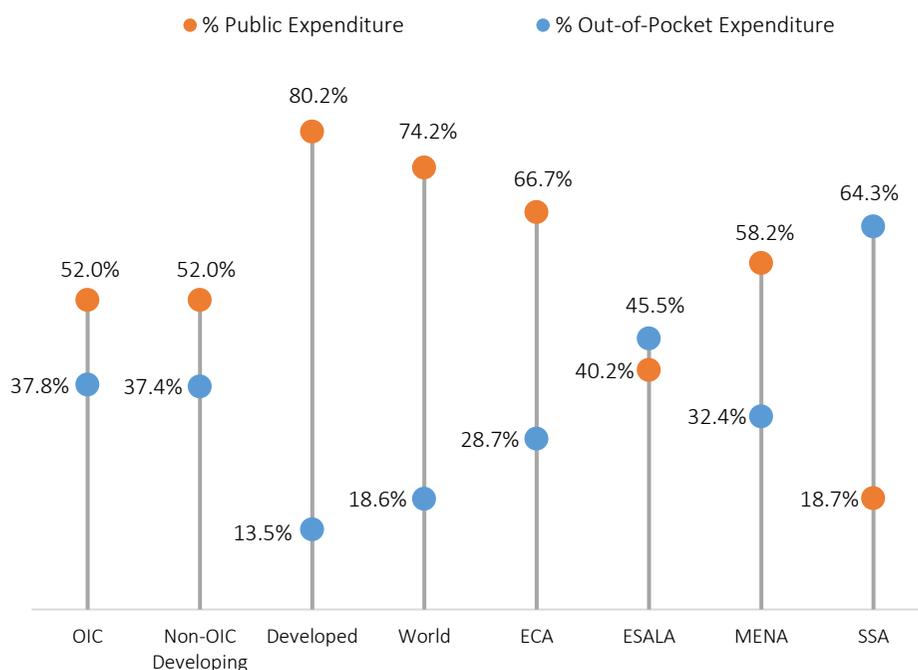
Health financing is a critical component of health systems. In 2016, approximately 7.5 million US\$ or 10% of world's GDP was allocated to health spending. Health expenditure is mainly related with generation, allocation and use of financial resources to provide health care services to all people at a reasonable and affordable cost. Total health expenditure comprises both the public and private sources for health care. Public financing mainly includes funds from government budget and social security schemes whereas private financing includes mainly private health insurance and out-of-pocket payments. The relative share of these sources in total health expenditures has many implications for access, equity and financial sustainability of health care services in a country. There is global evidence that to achieve the goal of universal health coverage it is necessary to generate a significant amount of financial resources for health through prepaid and pooled contributions like tax-based financing, social health insurance and private health insurance; whereas the share of direct out-of-pocket spending on health needs to be reduced (WHO, 2005).

Between 2000 and 2016, WHO finds that global spending on health has transformed but many states do not show a clear trend of increased government priority for health spending. At the same time, global trends show that domestic public funding has increased, and external financing has declined between 2000 and 2016.

Worldwide, public sector is the main source of health financing. However, in general, public health financing remained quite higher in advanced and high income countries compared to the developing and low income countries, respectively. As indicated in Figure 2.7, public sector accounted for 80.2% of global health spending in 2016. A similar situation could also be observed in case of developed countries where the difference between public and out-of-pocket spending is of 66.7%. Nevertheless, public financing covered only 52% of total health expenditures in both OIC and non-OIC developing countries. The remaining expenditure was undertaken using private sources.

In fact, private sources especially the out-of-pocket spending play a significant role in the financing of health expenditures in OIC countries. Even though globally, out-of-pocket expenditure on health declined from 2000-2016, out-of-pocket expenditures accounted for approximately 37.8% of total health expenditure in OIC countries in 2016. Compared to other groups' averages, the share of out-of-pocket health spending in total health expenditures remained the highest in OIC countries but it was closely followed by non-OIC developing countries with average out-of-pocket expenditure of 37.4% of total health expenditure (Figure 2.7). This indicates that in developing countries' heavy reliance on out-of-pocket payments, which is the most regressive way of health financing and has variety of harmful consequences especially for the low income and poor households.

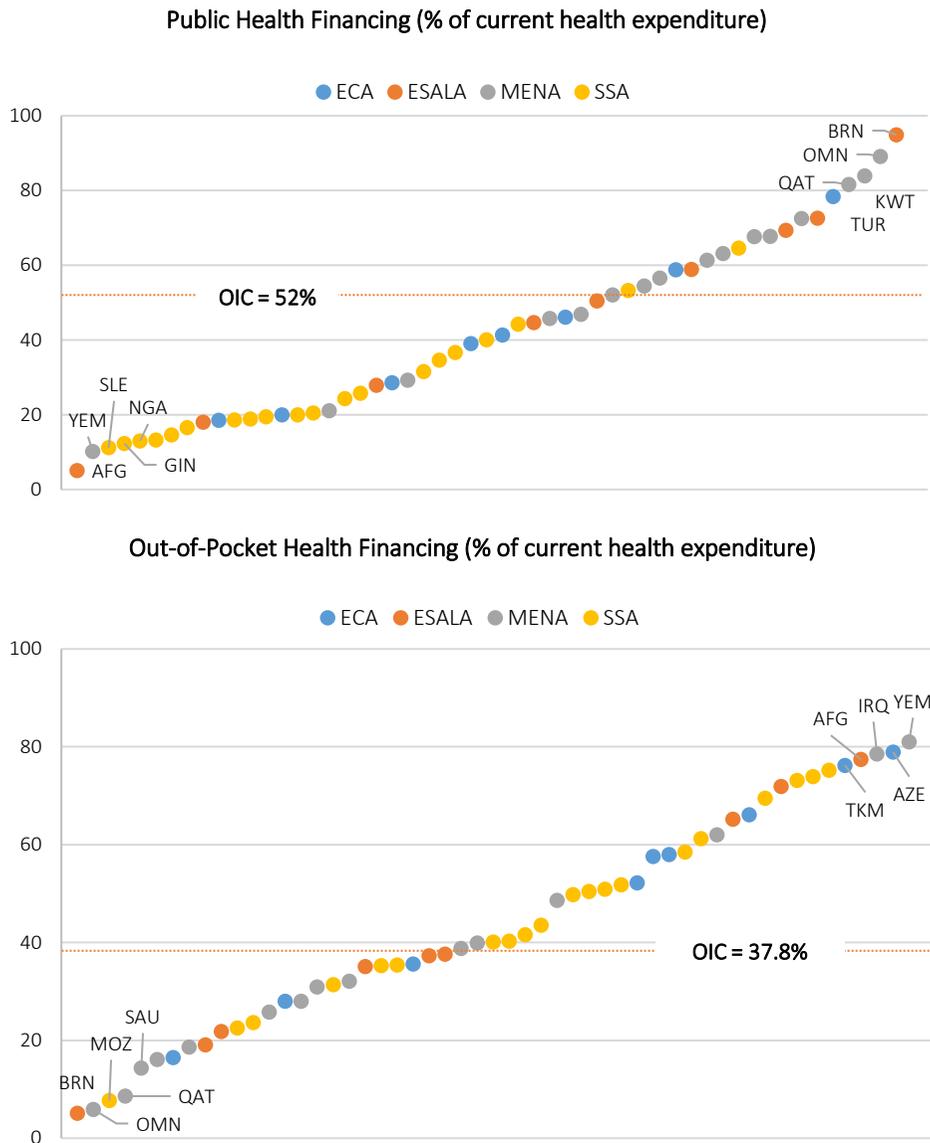


Figure 2.7: Sources of Health Finance (percentage of current health expenditure), 2016

Source: SESRIC staff calculations based on World Bank WDI

At the individual country level, out-of-pocket payments count for more than 50% of health financing in 21 OIC countries. Among these countries, out-of-pocket spending amounts to 81% of health expenditure in Yemen, 78.9% in Azerbaijan, 78.5% in Iraq, 77.4% in Afghanistan, and 76.2% in Turkmenistan. On the other hand, less than 20% of total health expenditures were financed through out-of-pocket payments in 9 OIC countries. Among these countries, out-of-pocket payments accounted for less than 15% of total health spending in Brunei Darussalam, Oman, Mozambique, Qatar, and Saudi Arabia (Figure 2.8).

Figure 2.8: OIC Countries with Highest and Lowest Shares in Health Financing, 2016



Source: World Bank, WDI

2.3 Health Workforce

Today, it is a well-recognized fact that the size, skill mix, geographical distribution and productivity of health workers play an important role in the prompt and efficient delivery of

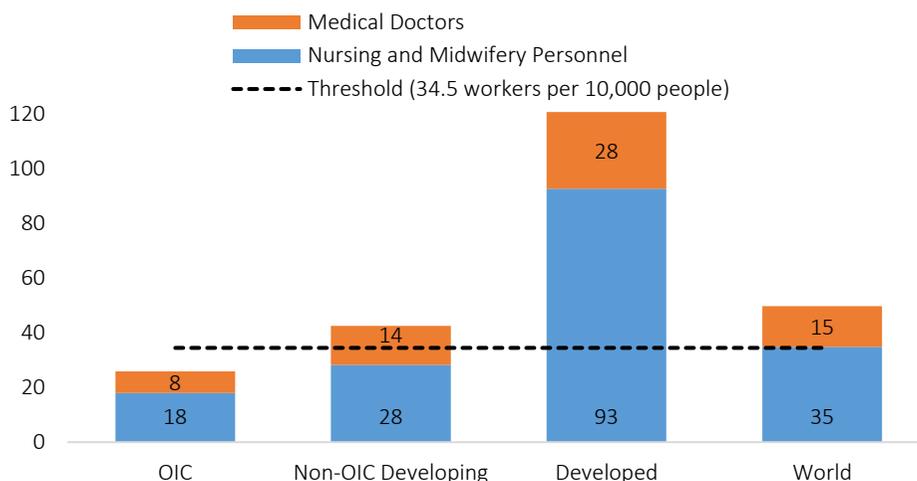


high quality health care. Health workers, particularly doctors and nurses, are the backbone of health care system. According to the latest estimates (for the latest year between 2001 and 2018), there were approximately 37 million physicians, nurses, and midwives in the world. The geographical distribution of these health workers remained highly skewed towards the developing countries, which accounted for more than half of the world total. During this period, OIC countries accounted for only 14% of the world total. In line with the global trend, nurses and midwives outnumber physicians in OIC countries, with a share of 69% that is similar to the world (60%) and non-OIC developing countries (66%) shares.

Overall, there is a strong positive correlation between health workforce density and health service coverage and outcomes in a country/region. Density of health workers (physicians, nurses and midwives per 10, 000 people) varies widely across the world. As shown in Figure 2.9, there were around 15 physicians and 35 nurses per 10 000 populations in the world in 2001-2018. In developed countries, there were 28 physicians and 93 nurses per 10, 000 populations in these countries compared to 14 physicians and 28 nurses in other developing countries. The density of both physicians and nurses and midwives remained comparatively very low in OIC countries as there were only 8 physicians and 18 nurses and midwives per 10,000 people in 2001-2018. In fact, density of health workers in OIC countries (26 per 10,000 people) was recorded below the critical threshold of 34.5, which is considered necessary to deliver the basic health services in a country/region.

Many OIC countries are still facing considerable challenges with respect to quantity, diversity and competency of the health workforce. Health workforce shortages are especially serious in countries located in the East and South Asia and Latin America (ESALA) and Sub-Saharan Africa (SSA) regions. Among the 56 OIC countries, for which the data are available, 34

Figure 2.9: Health Workers per 10,000 people, 2001-2018*

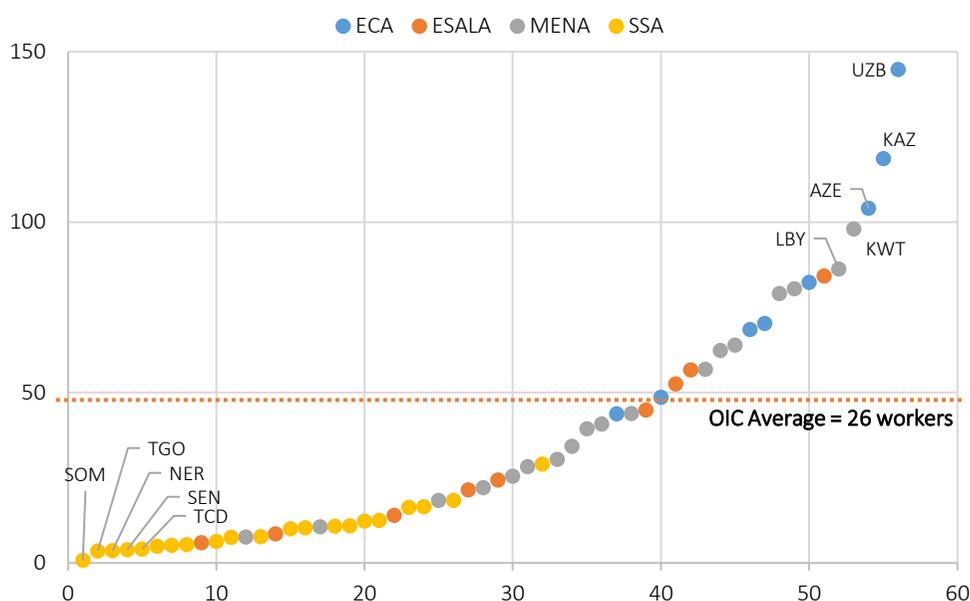


Source: SESRIC staff calculations based on World Health Organization Data Repository
 *Most recent data available



countries are facing critical shortage of health workers with less than 34.5 physicians, nurses and midwives per 10,000 people. Density of health workers was even less than 10 per 10,000 in 14 countries with critical shortages, 12 of them from Sub-Saharan Africa and two from South Asia. As shown in Figure 2.10, the highest number of doctors, nurses and midwives per 10,000 populations was recorded in Uzbekistan (145) followed by Kazakhstan (119) and Azerbaijan (104). On the opposite side of the scale, there were less than 5 health workers per 10,000 people in Somalia, Togo, Niger, Senegal, Chad, and Guinea.

Figure 2.10: OIC Countries with the Lowest/Highest Density of Medical Workers per 10,000 people, 2001-2018*



Source: SESRIC staff calculations based on World Health Organization Data Repository
*Most recent data available

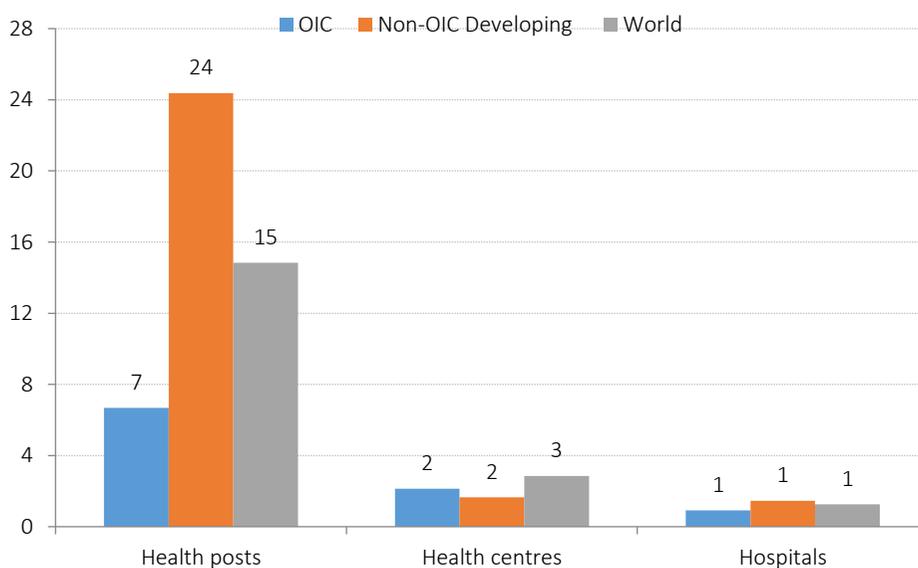
2.4 Healthcare Facilities

Health care facilities like hospitals and health posts are critical components of an efficient and effective health care system. In majority of the developing countries, health posts constitute the first level of contact between the health system and the communities. In 2013, as shown in Figure 2.11, the average number of health posts in 34 OIC countries, for which the data are available, was 6.7 per 100,000 populations; a level which is quite lower than the world average of 14.8 and the average of the non-OIC developing countries (24.4). Similarly, the average number of health centres was reported at 2.1 per 100,000 people in OIC countries compared to 2.9 in the world. With an average of 0.9 hospitals per 100,000 people, OIC countries are also lagging behind the world and non-OIC developing countries averages in terms of availability of district, provincial and specialized hospitals.



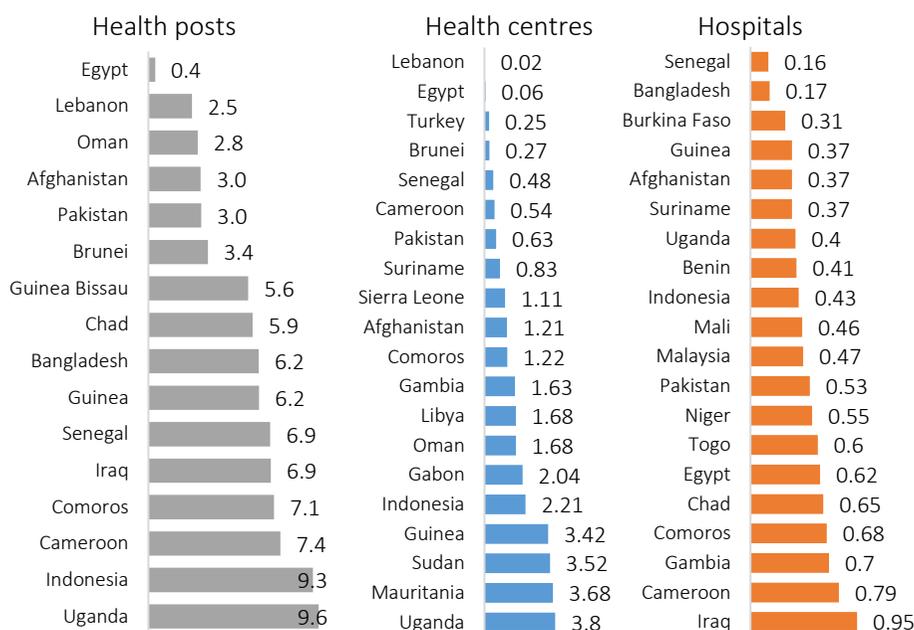
At the individual country level, 17 OIC countries reported more than 10 health posts per 100,000 people. Suriname recorded the highest density of health posts (45.3 per 100,000 population) followed by Gabon (29.4) and Libya (29.3). On the opposite side of the scale, even less than five health posts were available for 100,000 people in six OIC countries, with the lowest figure reported in Egypt (0.4) and Lebanon (2.5). Similarly, 26 OIC countries have less than 10 health centres per 100,000 people, and 29 OIC countries have less than two hospitals per 100,000 people in 2013.

Figure 2.11: Number of Health Facilities per 100,000 people, 2013



Source: SESRIC staff calculations based on World Health Organization Data Repository

Figure 2.12: OIC Countries with the Lowest Health Facilities per 100,000 people, 2013

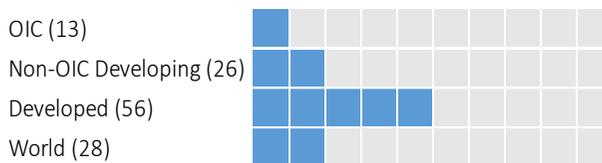


Source: SESRIC staff calculations based on World Health Organization Data Repository

2.5 Hospital Beds

Number of hospital beds is an important indicator of resources available for inpatient care and overall access to hospital services. As shown in Figure 2.13, globally there were 28 beds per 10,000 people in 2005-2015 (for the latest year with data). Density of hospital beds remained quite higher in developed countries where 56 hospital beds were available per 10,000 people; whereas in the group of non-OIC developing countries there were just 26 hospital beds available for 10,000 people. The availability of hospital beds remained comparatively very low in OIC countries, as there were only 13 hospital beds for 10,000 people in 2005-2015 (Figure 2.13).

Figure 2.13: Hospital Beds per 10,000 people, 2015*

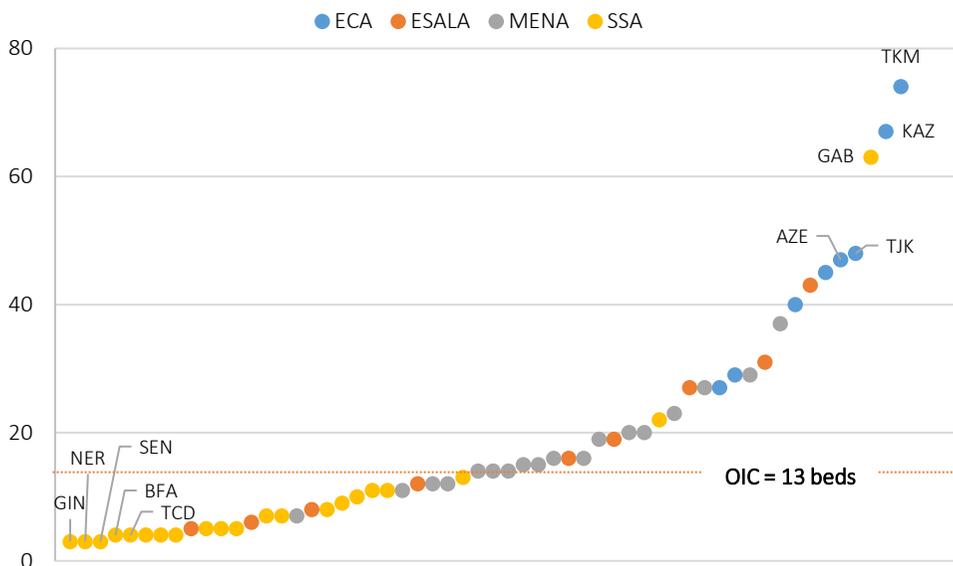


Source: SESRIC staff calculations based on World Health Organization Data Repository
 * Most recent data available



The number of hospital beds per 10,000 people varies considerably across the OIC countries. As shown in Figure 2.14, it is highest in Turkmenistan, Kazakhstan and Gabon with over 50 beds per 10,000 people. Nevertheless, this ratio is even less than 10 beds per 10,000 people for 19 OIC countries. Among these countries, Guinea, Niger and Senegal reported the lowest density of hospital beds with only three beds available per 10,000 people in 2005-2015.

Figure 2.14: OIC Countries with Highest and Lowest Density of Hospital Beds, 2005-2015*



Source: World Health Organization Data Repository

*Most recent data available

CHAPTER 3

Disease Prevention and Control

Prevention and control of diseases and pandemics is one of the most significant areas to be addressed in the domain of health. Cooperation in this area is a common interest of international community and all OIC countries. In this context, developing countries, including the OIC member countries have been taking various actions against diseases and pandemics through both their national health programs/strategies and their partnerships at the international level. As a substantial part of the developing countries, the group of OIC countries reflects high levels of heterogeneity and divergence in terms of socio-economic development. The existence of heterogeneity in terms of development profiles of OIC countries also seen in their performance in disease prevention and control.

The OIC countries have been striving over the years to develop multifaceted prevention, care and treatment strategies and programs and emergency preparedness plans. However, it seems that much more efforts are still needed in many of them to strengthen health infrastructures, capacity building of health professionals and improving access to essential medicine, including vaccines, especially in those OIC countries which lack the necessary resources to do so. This underlines the pressing need for closer collaboration at the regional and global levels with the involvement of relevant international institutions and initiatives in the area of health, such as the WHO and the Global Fund.

A look at the general trends in the cause-specific morbidity and mortality (i.e. prevalence of deaths due to communicable and non-communicable diseases, as well as injuries) is quite revealing. In OIC countries 59.2% of all deaths were caused by non-communicable diseases (NCDs) in 2016. Each year increasing number of people dies from NCDs in the OIC countries stemming from the positive trends seen in the risk factors (e.g. harmful use of alcohol and obesity). In OIC countries, communicable diseases (CDs) were responsible for 29.6% of all deaths in 2016, which was far exceeding the average of non-OIC developing countries as well as the world average. These basic figures imply that both in terms of prevention and control of CDs and NCDs, OIC countries need to design and implement more effective strategies.

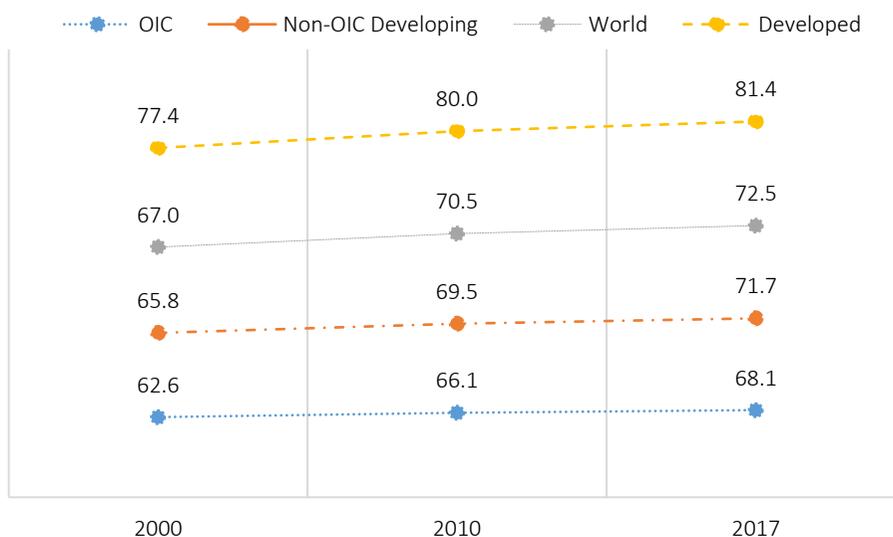


3.1 Life Expectancy at Birth

Life expectancy at birth (LEB) is an important indicator on overall health situation of the people in a country and the quality of health care services they are receiving. It is defined as the average number of years that a newborn is expected to live if health and living conditions at the time of birth remained at the same levels. In general, life expectancy at birth in a country is determined by a variety of socio-economic factors like state of poverty and undernourishment, access to clean water and sanitation, availability of primary health care services and immunization coverage.

Figure 3.1 displays the life expectancy rates between 2000 and 2017 across the globe. On average, OIC countries, as a group, witnessed an improvement in life expectancy at birth between 2000 and 2017 where LEB rose from 62.6 years in 2000 to 68.1 years in 2017. In the same period, LEB increased from 65.8 to 71.7 in non-OIC developing countries. Over this period, the worldwide average LEB climbed from 67 to 72.5. The average LEB in developed countries reached 81.4, which was the highest LEB among all groups in 2017. Concisely, despite major improvement in LEB, OIC countries, on average, still lag behind the average of non-OIC developing countries and the world average as well as the average of developed countries.

Figure 3.1: Life Expectancy at Birth (2000-2016)



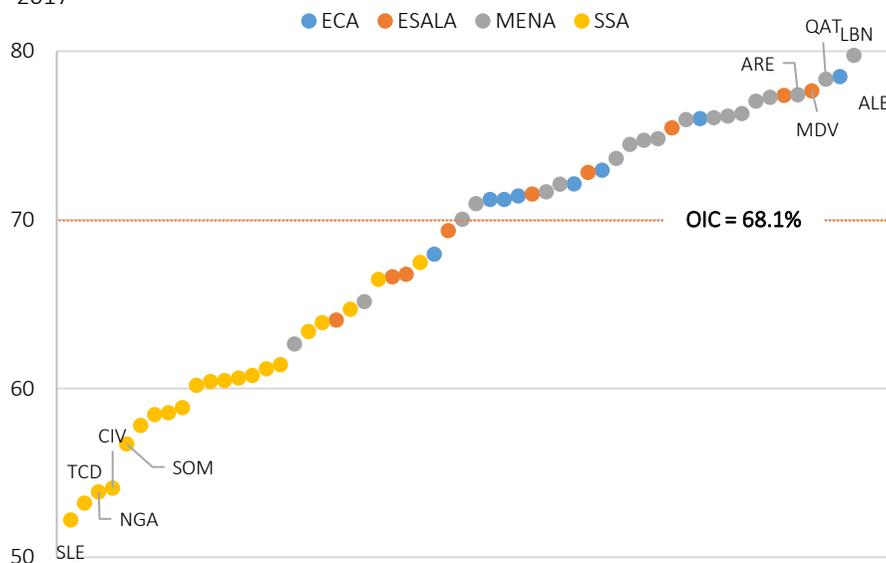
Source: SESRIC staff calculations based on World Bank WDI

Within the OIC group, the lowest LEB was mostly seen in countries located in Sub-Saharan African region (59.8 years), Latin America and Caribbean (69.1 years) and South Asia (70.2 years). On average, OIC countries in the East Asia Pacific (EAP) had the highest LEB, which was measured at 74.1 in 2017. At the individual OIC country level, as of 2017, the highest LEB was



observed in Lebanon (79.8 years). On the other side of spectrum, a person in Sierra Leone had only 52.2 years of life expectancy at birth (Figure 3.2).

Figure 3.2: OIC Countries with the Lowest and Highest Life Expectancy at Birth, 2017



Source: World Bank WDI

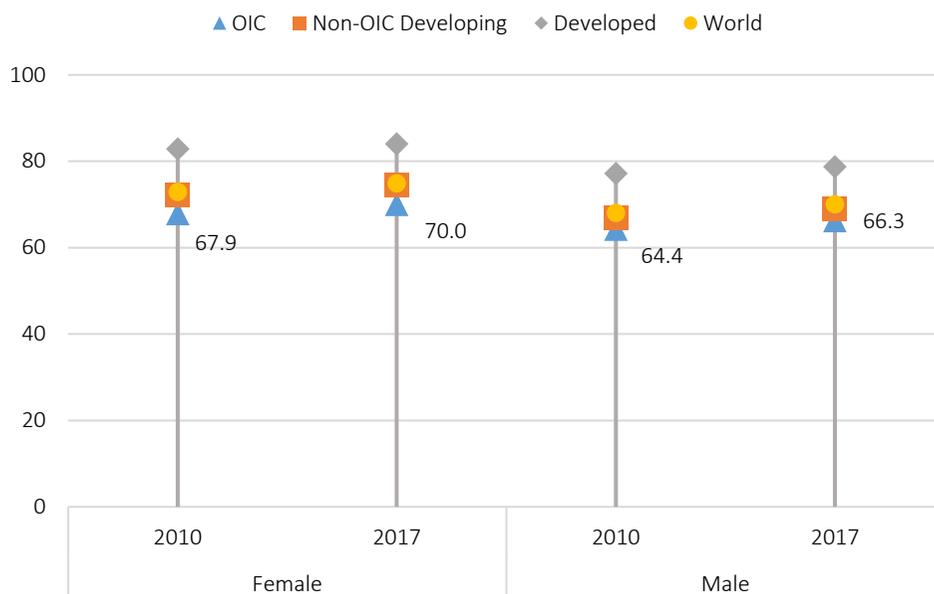
As in other country groups, another concern for OIC countries on LEB is the existence of disparity between male and female population. As of 2017, female LEB was 70, which was 3.7 years higher than male LEB at birth in OIC countries. In non-OIC developing countries female LEB also exceeded male LEB by 5.4 years. The worldwide LEB for female population was 4.9 years higher compared with male population in 2017 (Figure 3.3).

Due to more efficient and effective health care systems and better living standards, many developing countries, including OIC countries, have succeeded to increase their LEB. However, developed countries continued to improve their living standards as well, and therefore the existing gap seen in LEB between developing and developed countries did not narrow down remarkably.

Although LEB for both male and female population in OIC countries increased over time, the average of the OIC group continued to stay below the average LEB seen in developed countries. It is also evident that in OIC countries, on average, LEB did not increase equally for both male and female population. All these figures imply both the existence of problems related with the disease prevention and control as well as equal access to health services for male and female population in OIC countries.



Figure 3.3: Life Expectancy at Birth (Years) (2000-2017)



Source: SESRIC staff calculations based on World Bank WDI

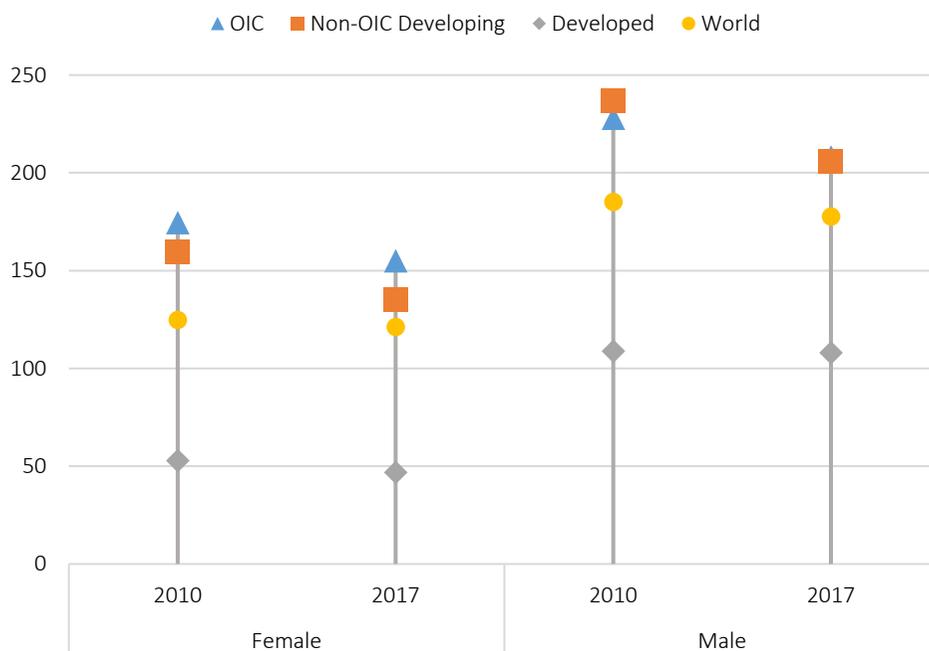
3.2 Adult Mortality Rate

Adult mortality rate (AMR) is defined as the probability of dying between the ages of 15 and 60 years per 1000 population. It is considered as one of the most common measures to assess the health situation in a country. Looking at the AMR for male and female population between 2010 and 2017 for country groups would be helpful to understand the level of progress made in the disease prevention and control by these country groups.

As shown in Figure 3.4, the worldwide average AMR for male population declined from 185.1 deaths per 1000 people in 2010 to 177.6 in 2017. For female population, the world average AMR went down from 124.7 to 121.2 in the same period. In the OIC countries, it is also seen that AMR figures are on the decline. Between 2010 and 2017, AMR for males decreased from 227.9 to 208.1, where AMR for females went down from 174.5 to 155.0 deaths per 1000 population. The gender gap in terms of AMR reduced from 53.4 to 53.0 that was a negligible change for the OIC group. Therefore, it is difficult to claim that there was a significant improvement in reducing the gender disparity in terms of AMR between 2010 and 2017 in the OIC countries. At the individual country level, Qatar recorded the lowest AMR (46) for female population whereas Sierra Leone had the highest AMR (383) in 2017. For male population, the highest AMR was recorded in Cote d'Ivoire (406) and the lowest AMR was observed in Qatar (64) (Figure 3.5). Overall, among the OIC regions, the highest AMR was

recorded in the OIC countries located in Sub-Saharan Africa both for male (297.7 deaths per 1000 population on average) and female population (253.7 deaths per 1000 population on average) as of 2017.

Figure 3.4: Adult Mortality Rate (per 1,000 people) (2000-2017)

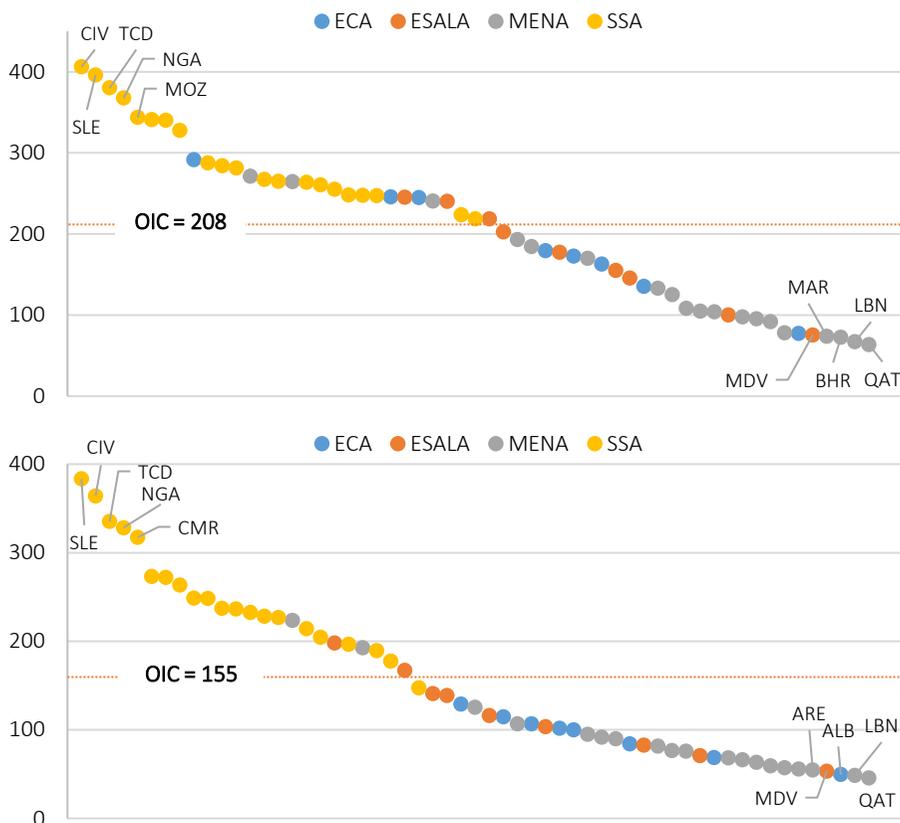


Source: SESRIC staff calculations based on World Bank WDI

Overall, the adult mortality situation has been improved remarkably in OIC countries and their AMR exhibited a downward trend during the period 2010-2017; thanks to the extensive efforts of national and international institutions to fight against communicable and non-communicable diseases. However, the improvement was not sufficient to catch up the world averages. Therefore, OIC countries need to invest more into health services to further reduce overall AMR and to eradicate the gender disparity in AMR to create more equal societies. For the success of these efforts, it is important to cooperate with international community and benefit from OIC countries' experiences.



Figure 3.5: OIC Countries with the Highest and Lowest Male (top) and Female (bottom) Adult Mortality Rate, 2017



Source: World Bank WDI

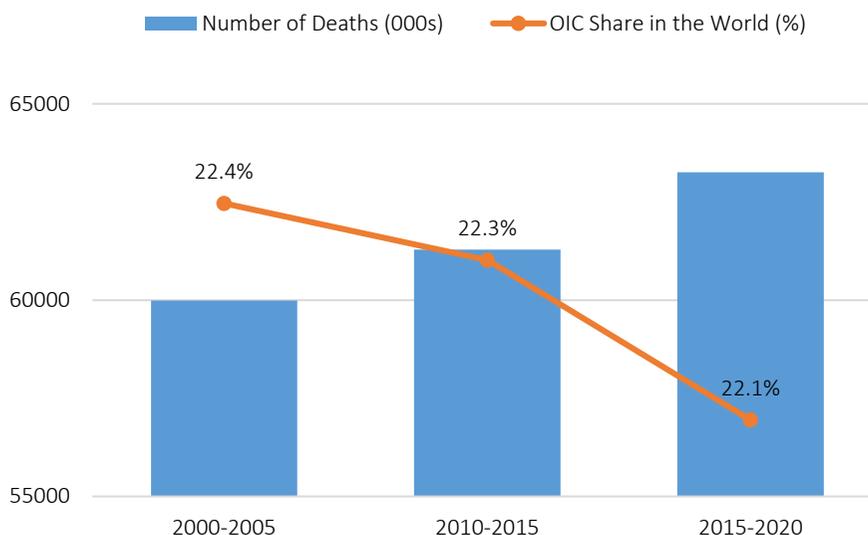
3.3 Causes of Death

In a country or a region, the number of total deaths could be decreased by improving the availability and access to health services and fighting with diseases such as through disease prevention efforts and the use of new technologies. Also, a negative trend in the number of conflicts, wars and natural disasters could contribute to the reduction in the number of total deaths in a certain country or a region.

Figure 3.6 presents the estimated number of total deaths in the OIC group and reports the share of the OIC in the world over the period 2000-2015. The number of total deaths in the OIC countries were estimated at around 60 million over the period 2000-2005. And this figure is estimated to reach 63.3 million during the period 2015-2020. Nevertheless, the share of recorded deaths of OIC countries in the world is on the decline that it went down from 22.4% in the period 2000-2005 to 22.3% in the period 2010-2015. It is estimated to go further down

to 22.1% during the period 2015-2020. This trend could be explained by a number of factors such as increased life expectancy, improved health services, and wide range of disease prevention efforts being implemented by the OIC countries.

Figure 3.6: Deaths in OIC Countries (all sexes) (2000-2020)



Source: SESRIC staff calculations based on UN DESA Estimates

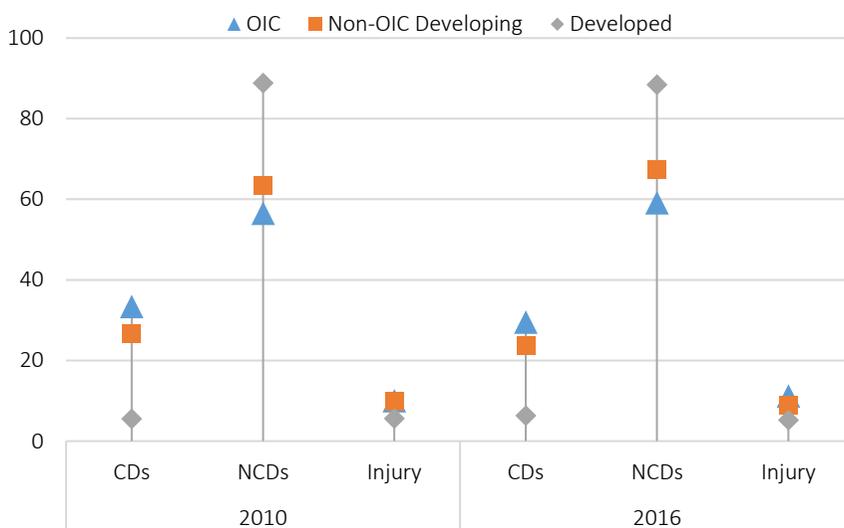
According to the WHO, causes of death can be grouped under three major categories: non-communicable diseases (NCDs), communicable diseases (CDs) and injury. Development levels of countries not only affect mortality rates, life expectancy and life quality of their inhabitants but also determine their major causes of death. As countries become more developed over time, they can invest more in fighting against easily preventable CDs and therefore their inhabitants do not usually die from such diseases. However, more developed countries tend to suffer more from NCDs that threaten their people such as diabetes, obesity and physical inactivity.

Figure 3.7 displays the causes of death across country groups in 2010 and 2016. According to the latest estimates, NCDs were the major cause of death worldwide. By 2016, 68.8% of all deaths in the world could be attributed to NCDs. In the OIC group, NCDs caused 56.6% of all deaths in 2010 and 59.2% in 2016. The share of CDs decreased from 33.4% in 2010 to 29.6% in 2016; thanks to the efforts of OIC countries to cope with communicable diseases in cooperation with relevant international institutions. The share of deaths caused by injury slightly increased from 10.0% in 2010 to 11.3% in 2016 in OIC countries. Overall, it becomes evident that NCDs increasingly pose a challenge for the health of people living in OIC countries. While implementing policies to fight against communicable diseases, therefore,



policymakers need to pay a special attention to the rise in the prevalence of deaths caused by NCDs (Figure 3.7).

Figure 3.7: Major Causes of Death (% of total deaths) (2000-2016)



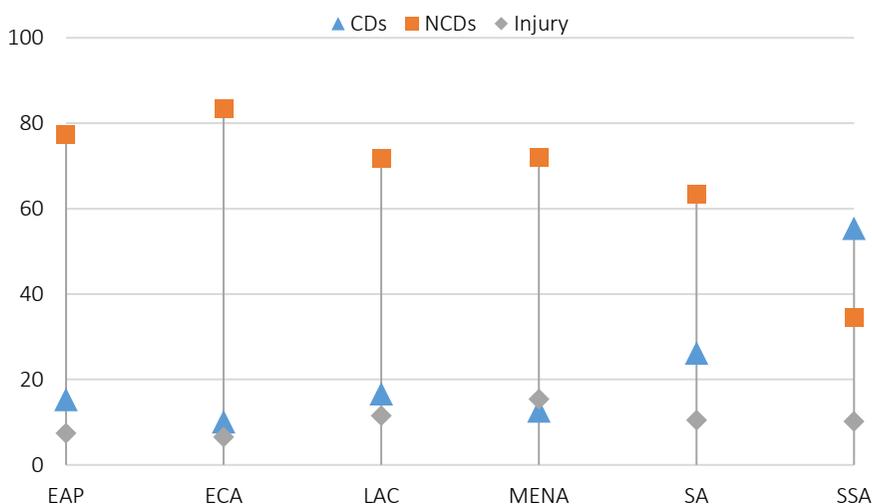
Source: SESRIC staff calculations based on World Bank WDI

In developed countries, in 2016, 88.5% of all deaths were caused by NCDs compared to 67.3% in non-OIC developing countries. On the other hand, in 2016, only 6.3% of all deaths were caused by CDs and the major reason behind 5.2% of all deaths were injuries in developed countries. However, in non-OIC developing countries CDs led many lives to come to an end that 23.7% of all deaths stemmed from CDs in 2016. Compared with the average of the OIC countries (29.6%), CDs were less impactful in non-OIC developing countries in terms of causing deaths. In non-OIC developing countries, injuries were responsible for 9.0% of all deaths in 2016.

At the OIC regional group level, Sub-Saharan Africa (SSA) suffered the most from CDs and maternal, prenatal and nutrition conditions where 55.4% of all deaths were caused by these diseases in 2016. South Asia region has the second highest average among OIC sub-regions in terms of deaths caused by CDs where 26.2% of people died from these diseases as of 2016 (Figure 3.8). At the individual country level, 65.3% of all deaths in Mozambique were caused by CDs and it was followed by Somalia with a share of 64.2% in 2016. These figures make Mozambique and Somalia the countries that are mostly affected by CDs in terms of having the highest percentage of deaths caused by CDs. On the other hand, Europe and Central Asia (ECA) region paid the highest bill in terms of deaths caused by NCDs where, on average, 83.4% of all deaths were caused by these diseases (Figure 3.8). ECA is followed by East Asia Pacific (EAP) region where 77.2% of all people died from NCDs. In 2016, about 93.1% of all deaths in

Albania were caused by NCDs, which is the highest share among OIC countries. Injuries cost lives of people the most in the MENA and LAC regions where 15.4% and 11.6% of all deaths were caused by injuries in 2016, respectively (Figure 3.8).

Figure 3.8: Major Causes of Death in OIC Regions (% of total deaths), 2016



Source: SESRIC staff calculations based on World Bank WDI

3.4 Communicable Diseases

Infectious diseases are caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi; the diseases can be spread, directly or indirectly, from one person to another. These types of diseases usually called as communicable and most of the time these diseases are preventable. This section looks at the prevalence of CDs in OIC countries.

3.4.1 HIV/AIDS

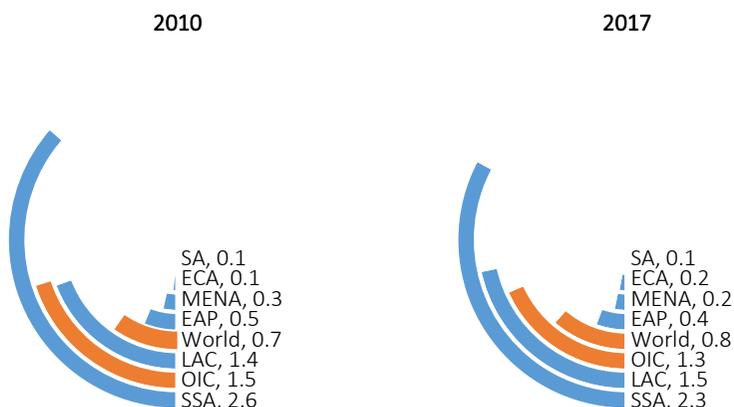
The Human Immunodeficiency Virus (HIV) targets the immune system and weakens people's surveillance and defence systems against infections and some types of cancer. As the virus destroys and impairs the function of immune cells, infected individuals gradually become immuno-deficient. The most advanced stage of HIV infection is Acquired Immunodeficiency Syndrome (AIDS), which can take from 2 to 15 years to develop depending on the individual. AIDS is defined by the development of certain cancers, infections, or other severe clinical manifestations.

According to WHO (2019), 1.7 million people newly infected with HIV in 2018 and around 38 million live with HIV in the world. The Africa region remained most severely affected region that around 1.1 million newly infected HIV cases were estimated in that region in 2018. HIV can be transmitted via the exchange of a variety of body fluids from infected individuals, such as blood, breast milk, semen and vaginal secretions. In order to diagnose, an HIV test is



required that reveals infection status by detecting the presence or absence of antibodies to HIV in the blood.

Figure 3.9: Prevalence of HIV (% of population aged 15 to 49) in the World and OIC Regions (2010-2017)

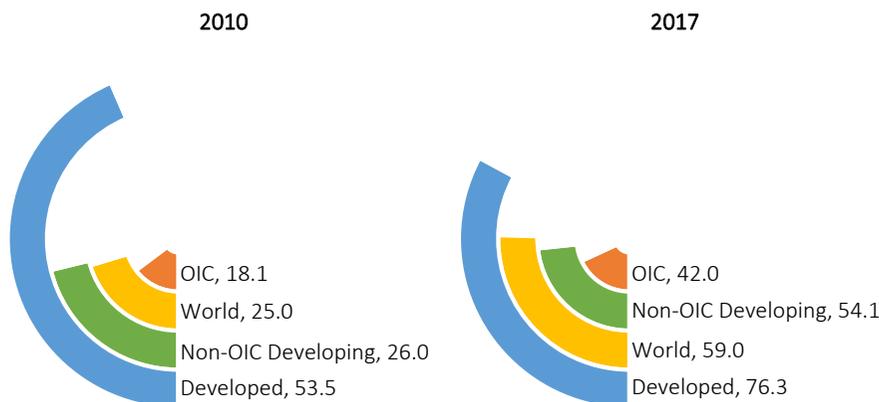


Source: SESRIC staff calculations based on World Bank Health Nutrition and Population Statistics

According to Figure 3.9 (left), the prevalence of HIV in the world slightly increased between 2010 and 2017. Thanks to the international and national campaigns, some OIC countries recorded significant decrease in the prevalence of HIV cases during this period. In 2017, the worldwide average prevalence rate was measured as 0.8%. The prevalence rate in OIC countries, on average, is on the decline that went down from 1.5% in 2010 to 1.3% in 2017. In the OIC sub-regions, the prevalence of HIV was concentrated especially in the SSA. The SSA region suffered the most from HIV where the average prevalence rate was measured at 2.3% in 2017; a rate which exceeded the world average (0.8%) and the OIC average (1.3%). Among the OIC sub-regions, the lowest HIV cases were recorded in SA where only 0.1% of all population were diagnosed with HIV (Figure 3.9, right).

The antiretroviral therapy coverage is being one of the most effective ways of AIDS prevention and treatment therapy. According to the WHO, antiretroviral drugs allow people with HIV to live for many years before developing symptoms of AIDS. The antiretroviral therapy coverage rate in the OIC group, on average, was on the rise that increased from 18.1% in 2010 to 42% in 2017. However, this average still lagged behind the world average of 59.0% in 2017 (Figure 3.10).

Figure 3.10: Anti-retroviral Therapy Coverage (% of people living with HIV) (2010-2017)

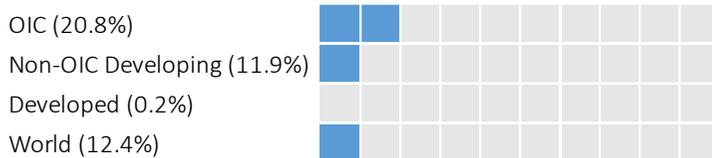


Source: SESRIC staff calculations based on World Bank Health Nutrition and Population Statistics

3.4.2 Diarrhoea

Diarrhoea is defined as the passage of three or more loose or liquid stools per day (or more frequent passage than is normal for the individual). It is the second leading cause of death in children under five years old worldwide. Each year diarrhoea kills around 525,000 children under five. Globally, there are nearly 1.7 billion cases of diarrheal disease every year. Diarrhoea is also a leading cause of malnutrition in children under five years old.

Figure 3.11: Mortality Rate Attributed to Unsafe Water, Unsafe Sanitation, and Lack of Hygiene (per 100,000 population), 2016



Source: SESRIC staff calculations based on World Bank WDI

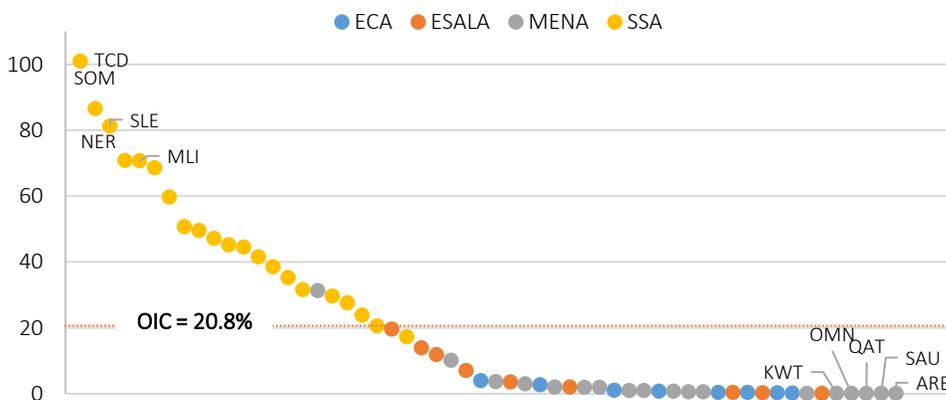
A significant proportion of diarrhoea can be prevented through safe drinking-water and adequate sanitation and hygiene. OIC countries, on average increased their sanitation

facilities and water sources compared with the 1990s. As of 2015, on average, 67.6% of population in the OIC countries have access to improved sanitation facilities and 84.3% of population have access to improved water sources (SESRIC, 2017). Nevertheless, the mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (per 100,000 population) was still high in OIC countries, on average, that was measured at 20.9 in 2016 where the world average was 12.5 in the same year (Figure 3.11). In this respect, OIC countries located in the SSA suffered the most. In Chad this figure was measured at 101 in 2016 and it



was followed by Somalia (86.6). Overall, these figures indicate that access to sanitation and water sources are still a key problem in a number of OIC countries, particularly in Sub-Saharan Africa. In particular, these two factors (unsafe water and lack of improved sanitation) are among the main causes for diarrhoea cases seen and are responsible for many deaths. Therefore, OIC countries need to invest more into infrastructure to reduce number of deaths caused by diarrhoea that is a preventable communicable disease.

Figure 3.12: Mortality Rate Attributed to Unsafe Water, Unsafe Sanitation and Lack of Hygiene in OIC Countries (per 100,000 population), 2016



Source: World Bank WDI

3.4.3 Malaria

Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected mosquitoes. In 2017, malaria caused an estimated 435,000 deaths mostly among African children. Malaria is a preventable and curable disease. Increased malaria prevention and control measures are dramatically reducing the malaria burden in several developing countries. Nevertheless, the total malaria cases in some OIC countries are on the rise and a result the share of OIC countries in the world in terms reported malaria cases went up from 50.8% in 2016 to 52.3% in 2017 (Figure 3.13). In 2017, there were an estimated 219 million cases of malaria in 87 countries. Burkina Faso (412), Mali (386) and Sierra Leone (380) were the top three OIC countries in terms of incidence of malaria (per 1,000 people) in 2017 (Figure 3.14).

The focus areas involved in combating malaria include public health information, science and research, prevention and control, case management, and regulating diagnostic tests and vaccines. In particular, antimalarial drugs and the use of insecticide-treated bed nets are very effective to combat with malaria among children. In this regard, OIC countries need to show

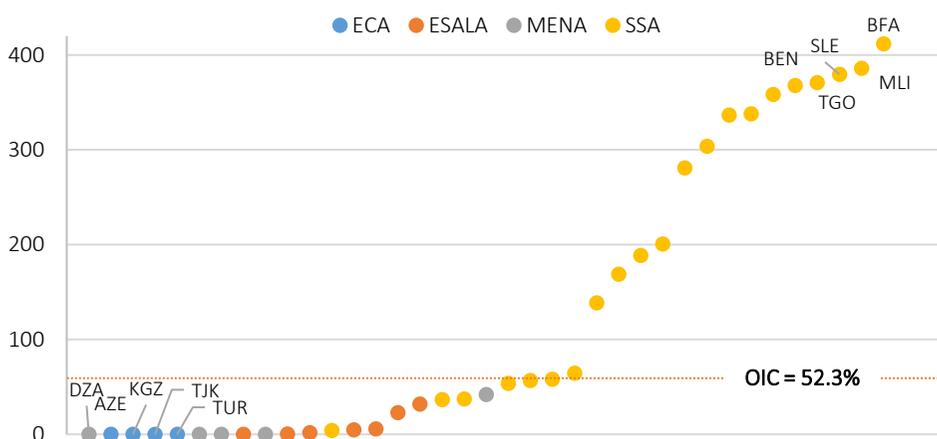
further efforts to fight with malaria by investing more into such drugs and bed nets. Both MDGs and SDGs referred to malaria and set targets for countries to fight with malaria across the globe. The OIC-SHPA 2014-2023 also presents a roadmap for OIC countries for the combat against malaria under the Thematic Area 2.

Figure 3.13: Reported Malaria Cases as Share of the World, 2017



Source: SESRIC staff calculations based on World Bank WDI

Figure 3.14: Incidence of Malaria in OIC (per 1,000 populations at risk), 2017*



Source: SESRIC staff calculations based on World Bank WDI.

Note: Countries with available data are reported

*Most recent data available

3.4.4 Pneumonia

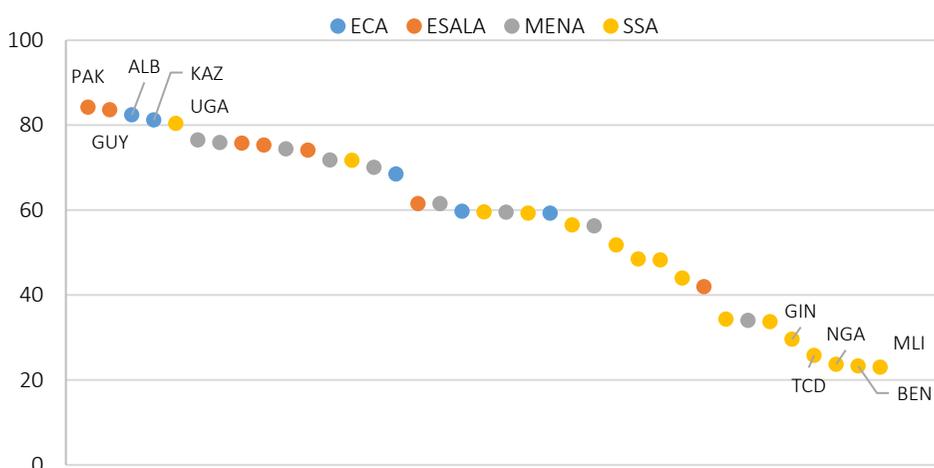
Pneumonia is a form of acute respiratory infection that affects the lungs. The lungs are made up of small sacs called alveoli, which fill with air when a healthy person breathes. When an individual has pneumonia, the alveoli are filled with pus and fluid, which makes breathing painful and limits oxygen intake.

Pneumonia is the single largest infectious cause of death in children worldwide and killed an estimated 808,694 children under the age of five in 2017, accounting for 15% of all deaths of children under 5 years old. Pneumonia affects children and families everywhere but is most prevalent in South Asia and Sub-Saharan Africa. Pneumonia can be prevented by immunization, adequate nutrition and by addressing environmental factors. Children can be protected from pneumonia; it can be prevented with simple interventions, and treated with low-cost, low-tech medication and care.



Acute Respiratory Infection (ARI) treatment is used to combat with pneumonia. It helps to improve breathing quality and over time eradicates pneumonia. According to SESRIC (2017), OIC countries, on average, have recorded an improvement in Acute Respiratory Infection (ARI) treatment rate since 1990s. Nevertheless, there is a wide gap among individual performance of OIC countries. For instance, in Mali, Benin and Nigeria, the rate stayed below 24%, whereas in OIC countries like Albania, Guyana and Pakistan it exceeded 80% (Figure 3.15). To this end, many OIC countries need to intensify their efforts to increase the ARI treatment coverage rate. In particular, OIC countries located in Sub-Saharan Africa who suffer a lot from pneumonia and related breathing problems need to record more progress.

Figure 3.15: Acute Respiratory Infection (ARI) Treatment (% of children under 5 taken to a health provider) in OIC Countries, 2017*



Source: SESRIC staff calculations based on World Bank WDI.

Note: Countries with available data are reported *Most recent data available

3.4.5 Tuberculosis

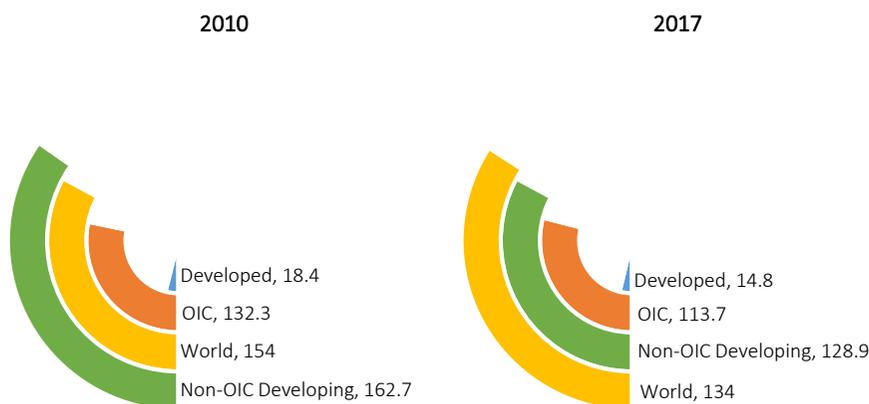
Tuberculosis (TB) is an infectious bacterial disease caused by mycobacterium tuberculosis, which most commonly affects the lungs. It is transmitted from person to person via droplets from the throat and lungs of people with the active respiratory disease. The symptoms of active TB of the lung are coughing, sometimes with sputum or blood, chest pains, weakness, weight loss, fever and night sweats.

According to the WHO, Tuberculosis (TB) is one of the top 10 causes of death worldwide. In 2017, 10 million people fell ill with TB, and 1.6 million died from the disease. In 2017, 87% of new TB cases occurred in the 30 high TB burden countries. Eight countries accounted for two thirds of the new TB cases: India, China, Indonesia, the Philippines, Pakistan, Nigeria, Bangladesh and South Africa where four of them are OIC member countries.



Tuberculosis is treatable with a six-month course of antibiotics. It was one of the specific communicable diseases mentioned in MDGs (MDG 6). Ending the TB epidemic by 2030 is among the health targets of the Sustainable Development Goals (SDGs). The estimated number of people falling ill with TB each year is declining, although very slowly.

Figure 3.16: Incidence of Tuberculosis (per 100,000 people), 2010 and 2017



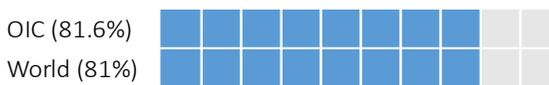
Source: SESRIC staff calculations based on World Bank Health Nutrition and Population Statistics

The worldwide incidence of tuberculosis went down from 154 in 2010 to 134 in 2017 (Figure 3.16). OIC countries, on average, also followed a similar negative trend where the incidence of tuberculosis decreased from 132.3 (per 100,000 people) in 2010 to 113.7 in 2017. In non-OIC developing countries, on average, the incident rate also regressed from 162.7 in 2010 to 128.9 in 2017.

A high success rate in tuberculosis treatment was one of the reasons behind the reduction in death tolls stemming from TB worldwide. OIC countries, on average, witnessed an increase in the TB treatment success rate that went up from 80.7% in 2010 to 81.7% in 2016 (Figure 3.17). The global success rate declined from 84 to 81% in the same period.

Overall, the OIC group, on average, recorded a significant progress in reducing the incidence of TB mainly stemming from prevention efforts and improved nutrition. Nevertheless, still OIC countries need to exert efforts to improve

Figure 3.17: Tuberculosis Treatment Success Rate (% of new cases), 2016



Source: SESRIC staff calculations based on World Bank Health Nutrition and Population Statistics



prevention efforts and TB treatment success rate in order to further reduce the number of new incidences and deaths caused by TB.

3.4.6 Polio

Polio is a highly infectious disease caused by a virus. It invades the nervous system and can cause total paralysis in a matter of hours. The virus is transmitted by person-to-person spread mainly through the faecal-oral route or, less frequently, by a common vehicle (e.g. contaminated water or food) and multiplies in the intestine. Initial symptoms are fever, fatigue, headache, vomiting, and stiffness in the neck and pain in the limbs. One in 200 infections leads to irreversible paralysis (usually in the legs). Among those paralysed, 5% to 10% die when their breathing muscles become immobilized.

Polio mainly affects children under 5 years of age. There is no cure for polio, it can only be prevented. Two vaccines promise the possibility of eradication. Polio cases have decreased by over 99% since 1988, from an estimated 350,000 cases then, to 33 reported cases in 2018. As a result of the global effort to eradicate the disease, millions of people have been saved from paralysis. The reduction is the result of the global effort to eradicate the disease. According to the WHO estimates, the eradication of polio would save at least US\$ 40–50 billion between 1988 and 2035, mostly in low-income countries including several OIC countries.

3.5 Non-Communicable Diseases

Chronic NCDs are the number one cause of death and disability in the world. The term NCDs refers to a group of conditions that are not mainly caused by an acute infection, result in long-term health consequences and often create a need for long-term treatment and care. These conditions include cancers, cardiovascular disease, diabetes and chronic lung illnesses among the major ones. Many NCDs can be prevented by reducing common risk factors such as tobacco use, alcohol use, physical inactivity and eating unhealthy diets.

According to the WHO, Non-communicable Diseases (NCDs) kill 41 million people each year, equivalent to 71% of all deaths globally. Cardiovascular diseases account for most NCD deaths, or 17.9 million people annually, followed by cancers (9.0 million), respiratory diseases (3.9 million), and diabetes (1.6 million). These four groups of diseases account for over 80% of all deaths caused by NCDs.

NCDs have significant socio-economic consequences. Millions of dollars are being allocated for the treatment of cardiovascular disease, cancer, diabetes and chronic respiratory disease, which undermine the sustainability of national health care budgets. According to the WHO estimates, almost 100 million people are pushed into poverty every year because they have to pay from their pockets for health services. This indicates that there is a strong correlation between NCDs and poverty. In developing countries many poor people fall into a dangerous vicious cycle where poverty and NCDs continually reinforce each other. The capacity of poor families to fight with NCDs goes down as they are more pushed into poverty and are left with



less money for basic needs. In this context, policies to combat NCDs need to include three components: treatment of diseases, reduction of risk factors that lead to NCDs (i.e. prevention) and addressing socio-economic impacts of NCDs on people. The United Nations and other international organisations pay a special attention to NCDs that affect millions of people all across the world. Sustainable development Goals (SDGs) specified a target to reduce by one third premature mortality from non-communicable diseases through prevention and treatment by 2030.

3.5.1 Cardiovascular Diseases, Cancer, Diabetes and Chronic Respiratory Diseases

3.5.1.1 Basic Facts

Cardiovascular diseases are caused by disorders of the heart and blood vessels, and include coronary heart disease (heart attacks), cerebrovascular disease (stroke), raised blood pressure (hypertension), peripheral artery disease, rheumatic heart disease, congenital heart disease and heart failure. The major causes of cardiovascular diseases are tobacco use, physical inactivity, an unhealthy diet and use of alcohol. The genetic and environmental factors have some effects on cardiovascular diseases as well.

Cardiovascular diseases (CVDs) are the number one cause of death globally. In other words, more people die annually from CVDs than from any other cause. According to the WHO, an estimated 17.9 million people died from CVDs in 2016, representing 31% of all global deaths.

According to the WHO, cancer is a generic term for a large group of diseases that can affect any part of the body. Other terms used are malignant tumours and neoplasms. One defining feature of cancer is the rapid creation of abnormal cells that grow beyond their usual boundaries, and which can then invade adjoining parts of the body and spread to other organs, the latter process is referred to as metastasizing. Metastases are the major cause of death from cancer.

Cancers are among the leading causes of morbidity and mortality worldwide, 9.6 million cancer related deaths reported in 2018. Globally, nearly 1 in 6 deaths is due to cancer. Around one third of deaths from cancer are due to the 5 leading behavioural and dietary risks: high body mass index, low fruit and vegetable intake, lack of physical activity, tobacco use, and alcohol use. In 2018, the most common causes of cancer death are cancers of lung (2.09 million deaths), breast (2.09 million), and colorectal (1.80 million).

Chronic Respiratory Diseases (CRD) are diseases of the airways and other structures of the lung. Some of the most common diseases include asthma, chronic obstructive pulmonary disease (COPD) and respiratory allergies. Hundreds of millions of people suffer every day from chronic respiratory diseases. According to the latest WHO estimates, about 235 million people suffered from asthma in 2017. More than 3 million people died of COPD in 2017, which is equal to 6% of all deaths globally that year.



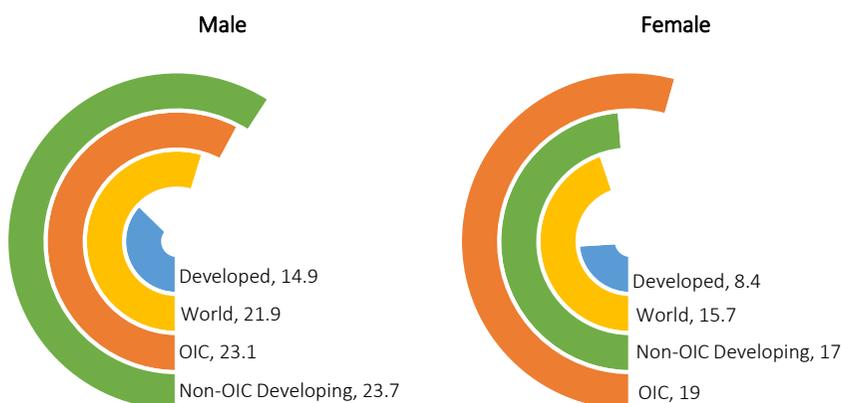
In addition to tobacco smoke, other risk factors such as air pollution, occupational chemicals and dusts, and frequent lower respiratory infections during childhood are among the leading causes of CRD.

Diabetes is a chronic NCD that occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use the insulin, it produces. Hyperglycaemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels. The causes of diabetes are complex. However, the global increase in the prevalence of diabetes can be attributed to rapid increases in overweight, including obesity and physical inactivity. In 2016, an estimated 1.6 million deaths were directly caused by diabetes in the world.

3.5.1.2 Mortality Rates

Figure 3.18 presents the mortality rate stemming from CVD, Cancer, Diabetes or CRD between exact ages 30 and 70 in 2010 and 2016. Among female population, the mortality rate went down from 16.6% in 2010 to 15.7% in 2016 at the global level. A similar reduction was seen among the male population that the rate decreased from 23.3 to 21.9% over the same period. OIC countries, on average, also achieved to reduce the mortality rate both for male and female population over this period. The average mortality rate of OIC countries for male population went down from 24.3% in 2010 to 23.1% in 2016 whereas for female population the rate decreased from 20.2% in 2010 to 19.0% in 2016. Among non-OIC developing countries, on average, a similar downward trend was observed during 2010-2016 period among male and female population.

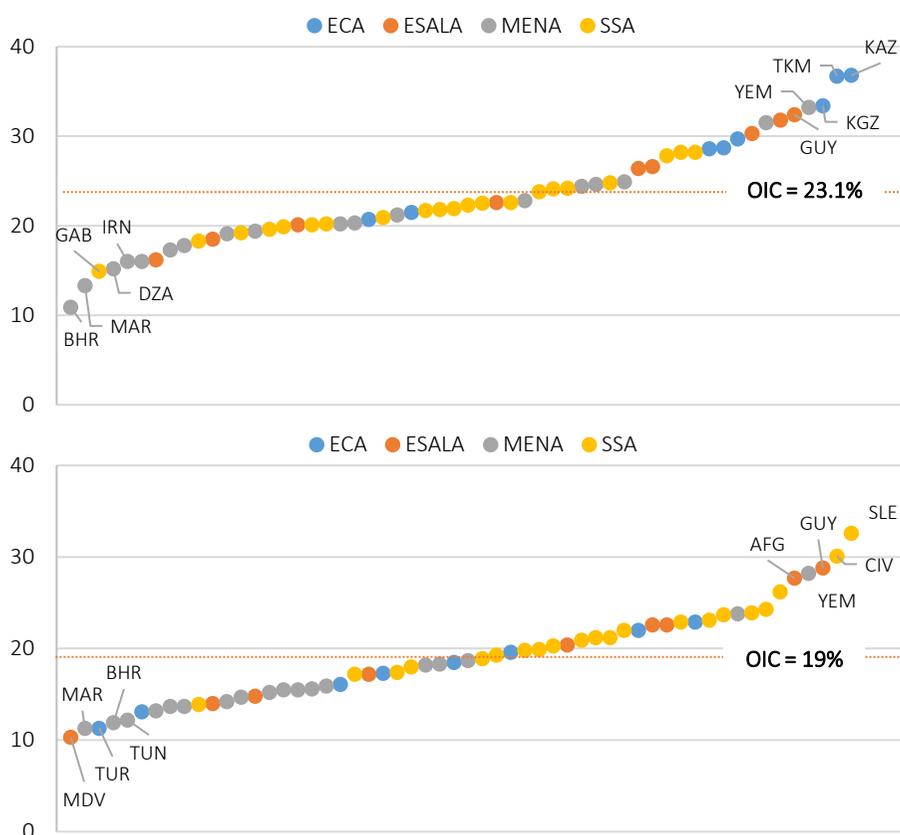
Figure 3.18: Mortality from CVD, Cancer, Diabetes, or CRD between exact ages of 30 and 70 (%), 2016



Source: SESRIC staff calculations based on World Bank Health Nutrition and Population Statistics

At the individual country level, among the female population, the lowest mortality rate led by CVD, Cancer, Diabetes or CRD was seen in Maldives (10.3%), Morocco (11.3%), Turkey (11.3%) and Bahrain (11.9%) in 2016. Sierra Leone (32.6%) and Côte d'Ivoire (30.1%) had the highest mortality rate in the same year. Among male population Bahrain (10.9%) and Morocco (13.3%) were two OIC countries with the lowest mortality rate whereas Kazakhstan (36.8%) and Turkmenistan (36.7%) had the highest mortality rate (Figure 3.19).

Figure 3.19: OIC Countries with the Highest and Lowest Male (top) and Female (bottom) Mortality FROM CVD, Cancer, Diabetes or CRD (%), 2016



Source: World Bank Health Nutrition and Population Statistics

Overall, the figures reveal that OIC countries, on average, recorded a progress in coping with CVD, Cancer, Diabetes or CRD over the period 2010-2016. Nevertheless, they need to intensify their efforts both in terms of prevention, detection and treatment in order to further reduce the mortalities caused by such diseases.



3.5.1.3 Prevention and Treatment

Most cardiovascular diseases can be prevented by addressing behavioural risk factors such as tobacco use, unhealthy diet, obesity, physical inactivity, and harmful use of alcohol. Many medical devices and drugs are available worldwide to improve the well-being of patients with CVD and to cure them. In this regard, OIC countries need to intensify their efforts to fight with risk factors (e.g. obesity, physical inactivity etc.) that lead to cardiovascular diseases as well as to improve and scale-up specific treatment methods used on cardiovascular diseases.

Every cancer type requires a specific treatment regimen which encompasses one or more modalities such as surgery, and/or radiotherapy, and/or chemotherapy. In this regard, early detection and correct diagnosis are essential for adequate and effective treatment. Around one third of cancer deaths are due to five leading behavioural and dietary risks: high body mass index, low fruit and vegetable intake, lack of physical activity, tobacco use, and alcohol use. Tobacco use is the most important risk factor for cancer causing around 20% of global cancer deaths and around 70% of global lung cancer deaths. Therefore, fighting with these risk factors carries a critical importance for all countries in order to reduce deaths caused by cancer. Innovative technologies and new drugs have become available to treat people with cancers. In this regard, OIC countries need to further improve their national health system capacities to provide such medicines and technologies to their people in a timely manner.

According to the WHO, main risk factors for respiratory diseases consist of tobacco smoking, indoor air pollution, outdoor pollution, allergens, and occupational risks and vulnerability. While investing into treatment of respiratory diseases, OIC countries should not neglect to implement policies to reduce abovementioned risk factors that cause millions of deaths each year. In this regard, “Tobacco Free OIC” initiative of the Statistical Economic and Social Research and Training Centre for Islamic Countries (SESRTC) could play an important role to reduce mortalities caused by respiratory diseases across OIC countries. Although, most of the CRD are not curable, technology and medicines have helped people with CRD in improving their quality of life. In this regard, OIC countries need to closely monitor developments in this domain for effective provision of such treatment medicines and technologies for their people.

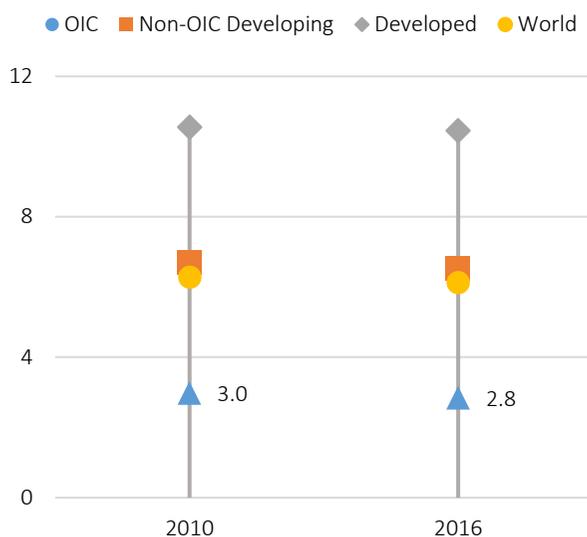
OIC countries need to exert significant efforts to fight with risk factors that could cause diabetes such as obesity and insufficient physical activity. In particular, some ingredients used in the food industry such sugar and additives should be monitored carefully by national authorities to reduce the prevalence of diabetes in the long run in OIC countries. Also, awareness campaigns on diabetes and promotion of healthy lifestyles at social circles would play a role in the prevention of diabetes.

3.6 Risk Factors

Risk factors can be described as the factors that lead to NCDs all across the world spanning from harmful use of alcohol to physical inactivity. This sub-section overviews the stance of



Figure 3.20: Alcohol Consumption per capita (15+), 2010 and 2016



Source: SESRIC staff calculations based on World Bank Health Nutrition and Population Statistics

estimates. In particular, in the age group 20-39 years approximately 13.5% of the total deaths are alcohol attributable.

Beyond health consequences, use of alcohol brings significant social and economic losses to individuals and society. In this context, governments all across the world need to fight with the harmful use of alcohol. Figure 3.20 shows that the world average in recorded alcohol per capita consumption reduced from 6.3 litres in 2010 to 6.1 litres in 2016. The OIC group, on average, witnessed a slight decrease from 3.0 litres to 2.8 litres in the same period. Developed countries, on average, also saw a reduction from 10.6 litres to 10.5 litres. The average of non-OIC developing countries also slightly went down from 6.7 litres in 2010 to 6.5 litres in 2016.

These figures imply that, on average, there is a worldwide downward trend in terms of the harmful use of alcohol. Nevertheless, some OIC countries need to exert more efforts which have a very high average alcohol consumption per person. In particular, such OIC countries mostly concentrated in the SSA (4.3 litres) and ECA (4.4 litres) regions. Such OIC countries need to develop and implement effective strategies to reduce the harmful use of alcohol. Some of the worldwide used strategies in this regard include:

- regulating the marketing of alcoholic beverages (particular to younger people);
- regulating and restricting availability of alcohol;
- enacting appropriate drink-driving policies;
- reducing demand through taxation and pricing mechanisms;

OIC countries in the selected major risk factors compared with other groups and draws some policy-recommendations for the way forward.

3.6.1 Use of Alcohol

Use of alcohol is a causal factor in more than 200 diseases including infectious diseases such as tuberculosis as well as the course of HIV/AIDS and injury conditions. It is therefore a risk factor for several diseases that impacts millions of people across the world. Globally, 3 million deaths every year result from harmful use of alcohol; this represents 5.3% of all deaths, according to the WHO



- raising awareness of public health problems caused by harmful use of alcohol and ensuring support for effective alcohol policies;
- providing accessible and affordable treatment for people with alcohol-use disorders; and
- implementing screening and brief interventions programmes for hazardous and harmful drinking in health services.

In addition to abovementioned global strategies, OIC countries with the help of Islamic scholars can convey the unique message of Islam to the society that Islam prohibits the use of alcohol. If the message is delivered widely and effectively to the society, this strategy can help many Muslims all across OIC countries to stop alcohol intake.

Figure 3.21: Smoking Prevalence, total (ages 15+), 2010 and 2016



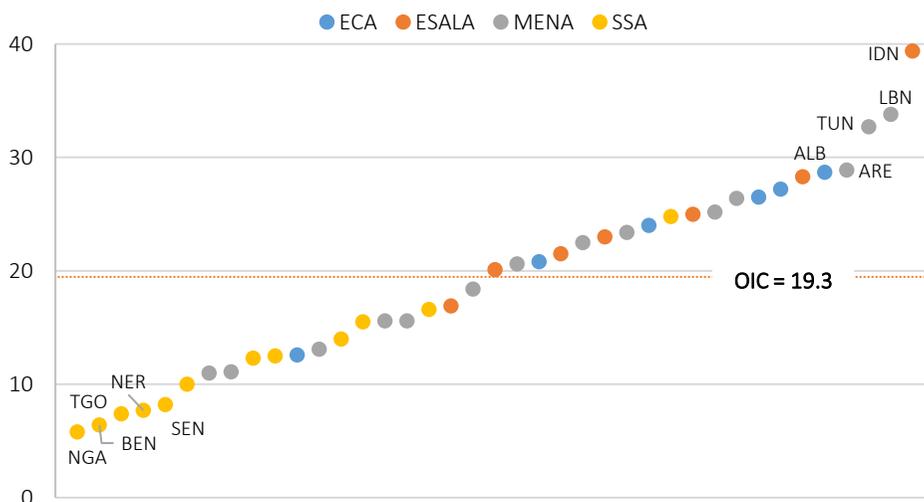
Source: SESRIC staff calculations based on World Bank Health Nutrition and Population Statistics

3.6.2 Tobacco Use

The WHO declares that tobacco kills up to half of its users. There are more than 4000 chemicals in tobacco smoke, of which at least 250 are known to be harmful and more than 50 are known to cause cancer. It is estimated that tobacco kills more than 8 million people each year. More than 7 million of those deaths are the result of direct tobacco use while more than 1.2 million are the result of non-smokers being exposed to second-hand smoke. Developing countries in general suffer the most from tobacco use. Nearly 80% of the world's 1.1 billion smokers live in low- and middle-income countries. Tobacco users who die prematurely deprive their families of income, raise the cost of health care and hinder economic development.

As Figure 3.21 displays, despite exerting global efforts to reduce tobacco use, the prevalence of smoking did not go down significantly that only reduced from 22.7% in 2010 to 20.5% in 2016 at the global level. In OIC countries, the average tobacco smoking rate decreased from 20.2% in 2010 to 19.3% in 2016. The average of the non-OIC developing countries stayed above the world average both 2010 and 2016. At the individual OIC country level, as shown in Figure 3.22 (right), Indonesia had the highest smoking prevalence rate (39.4%) followed by Lebanon (33.8%) and Tunisia (32.7%) in 2016. In Niger, Togo, Benin and Nigeria, the prevalence rates stayed below 8% that were the lowest rates seen among OIC countries in 2016.

Figure 3.22: Smoking Prevalence in OIC Countries (ages 15+), 2016



Source: World Bank Health Nutrition and Population Statistics

Some effective ways to cope with tobacco use are including raising tax on tobacco products, banning advertisements for tobacco products, restricting areas to smoke in general. The WHO Framework Convention on Tobacco Control entered into force in February 2005. Since then, it has become one of the most widely embraced treaties in the history of the United Nations with 180 states, covering 90% of the world's population. In 2008, the WHO introduced a practical, cost-effective way to scale up implementation of provisions of the WHO Framework Convention on the ground called MPOWER. The six MPOWER measures include:

- Monitor tobacco use and prevention policies;
- Protect people from tobacco use;
- Offer help to quit tobacco use;
- Warn about the dangers of tobacco;
- Enforce bans on tobacco advertising, promotion and sponsorship; and
- Raise taxes on tobacco.

The response of the OIC to tobacco use was also very effective and comprehensive. The process started in 2007 with an initiative developed by the Statistical Economic and Social Research and Training Centre for Islamic Countries (SESRIC) in response to the spread of tobacco epidemic in the OIC countries that is called “Tobacco Free OIC”. It aims to foster an OIC-wide coordinated approach to curb and control the spread of tobacco epidemic in OIC countries. This initiative focuses on training and capacity building programs to facilitate the development and implementation of sustainable national tobacco control strategies in OIC countries. In accordance with the decisions and resolutions of the First Islamic Conference of



Health Ministers (2007), major objectives of the Tobacco Free OIC initiative can be listed as follows:

- to increase public awareness about controlling tobacco, use by providing evidence-based knowledge and information, and by this way, to prevent children from starting tobacco use;
- to establish OIC networks and partnerships to exchange experiences and best practices of tobacco control strategies, initiatives, projects and programs; and
- to build the capacity of relevant organizations or institutions for better policy coordination in order to achieve the goal of Tobacco Free OIC.

The OIC Strategic Health Programme of Action 2014-2023 (OIC-SHPA) also lists actions need to be taken related with fight against tobacco use under several thematic areas. To this end, both at the global and the OIC level, there are initiatives and mechanisms to cope with tobacco use. In cooperation with international organisations, OIC countries can effectively reduce tobacco use and can save many lives.

3.6.3 *Insufficient Physical Activity*

The WHO defines physical activity as any bodily movement produced by skeletal muscles that require energy expenditure – including activities undertaken while working, playing, carrying out household chores, travelling, and engaging in recreational pursuits. Both, moderate and vigorous intensity physical activity brings health benefits. Insufficient physical activity is one of the 10 leading risk factors for death worldwide. Globally, 1 in 4 adults is not active enough, according to the WHO and it is a key risk factor for non-communicable diseases (NCDs) such as cardiovascular diseases, cancer and diabetes.

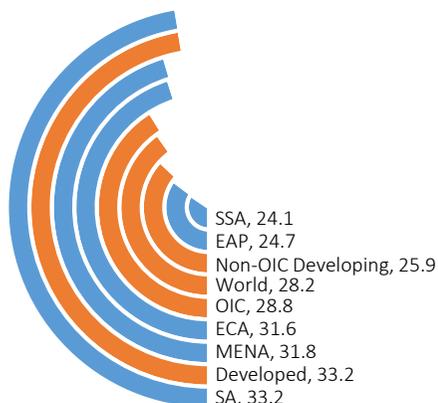
Physical activity has significant health benefits and contributes to prevent NCDs. More than 80% of the world's adolescent population is insufficiently physically active. Socio-economic and socio-cultural factors affect lifestyles of people. With increased urbanisation, some additional factors started to influence physical activity. The common reasons behind physical inactivity in urban areas are violence, high-density traffic, low air quality, pollution, and lack of parks, sidewalks and sports/recreation facilities.

Figure 3.23 shows the prevalence of insufficient physical activity among adults across country groups and OIC sub-regions in 2016. In OIC countries, on average, the prevalence of insufficient physical activity was 28.8% that exceeded the world average (28.2%) and the average of non-OIC developing countries (25.9%). Across the OIC sub-regions, the highest prevalence of insufficient physical activity was seen in SA with an average rate of 33.2%. SSA had the lowest prevalence of insufficient physical activity (24.1%) in 2016.

The member states of the WHO have agreed to reduce insufficient physical activity by 10% by 2025. In order to encourage physical activity, governments need to ensure that: walking, cycling and other forms of active transportation are accessible and safe for all; labour and



Figure 3.23: Prevalence of Insufficient Physical Activity among 18+ Population (%), 2016



Source: SESRIC staff calculations based on World Health Organization Data Repository

Note: Latin American region could not be reported due to missing data

workplace policies encourage physical activity; schools have safe spaces and facilities for students to spend their free time actively; physical education supports children to develop behaviour patterns that will keep them physically active throughout their lives; and sports and recreation facilities provide opportunities for everyone to do sports. In this regard, policy makers in OIC countries need to make necessary arrangements to promote more physically active lifestyle in order to have healthier generations and to reduce the pressure on social security systems.

3.6.4 Obesity

Obesity is defined as abnormal or excessive fat accumulation that may impair health. The WHO defines obesity as body mass index (BMI) greater than or equal to 30.¹ Obesity leads to adverse metabolic effects on blood pressure, cholesterol, triglycerides and insulin resistance.

Risks of coronary heart disease, ischemic stroke and type 2 diabetes mellitus increase steadily with increasing BMI. A higher BMI also raises the risk of cancer of the breast, colon, prostate, endometrium, kidney and gall bladder. Mortality rates go up with increasing degrees of overweight, as measured by body mass index.

The worldwide obesity has nearly tripled since 1975. In 2016, more than 1.9 billion adults, 18 years and older, were overweight that their BMI exceeds 25. Of these over 650 million were obese. Globally, 13% of adults aged 18 years and over were obese in 2016.

¹ Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m²).

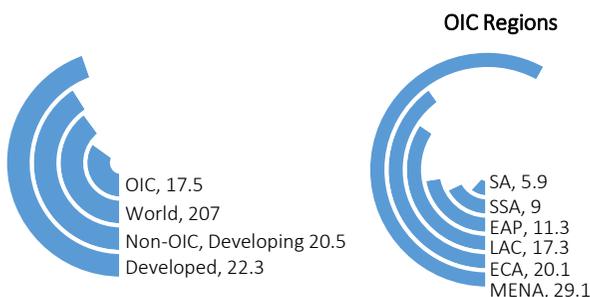


The prevalence of raised body mass index increases with the income level of countries. According to the WHO estimates, for obesity the overall prevalence is over four times higher in high income countries compared to low income countries.

According to Figure 3.24 (left), in the OIC group the prevalence of obesity increased from 15.2% in 2010

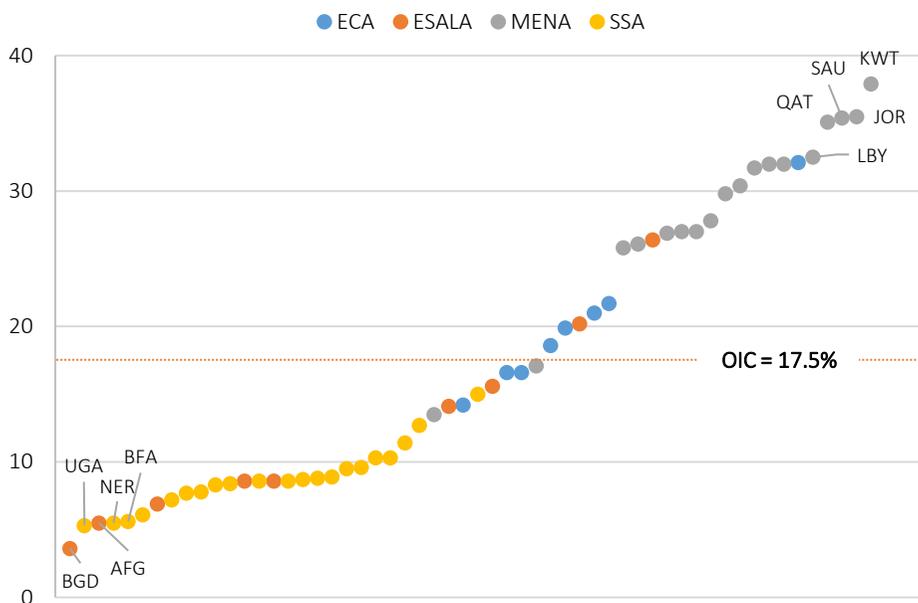
to 17.5% in 2016. In developed countries, the average prevalence rate reached 22.3% in 2016. Among all country groups, the average of OIC countries was the lowest in 2016 in terms of the prevalence of obesity. Among the OIC sub-regions, MENA was exposed to obesity the most with an average prevalence rate of 29.1% in 2016. SA had the lowest obesity prevalence rate among all OIC sub-regions with an average prevalence rate of 5.9% (Figure 3.24, right). At the individual country level, Kuwait (37.9%) and Jordan (35.5%) had the highest prevalence

Figure 3.24: Prevalence of Obesity among 18+ Population (%), 2010 and 2016



Source: SESRIC staff calculations based on World Health Organization Data Repository

Figure 3.25: Prevalence of Obesity among Adults, 18+ Years in OIC Countries (% of population), 2016



Source: World Health Organization Data Repository

of obesity in 2016. On the other side of the spectrum, the prevalence of obesity was the lowest in Bangladesh (3.6%) among OIC countries (Figure 3.25).

Obesity is preventable. At the individual level, people can limit energy intake from total fats and sugars; increase consumption of fruit and vegetables, as well as legumes, whole grains and nuts; engage in regular physical activity (60 minutes a day for children and 150 minutes per week for adults). The food industry can play a significant role in promoting healthy diets by reducing the fat, sugar and salt content of processed foods; ensuring that healthy and nutritious choices are available and affordable to all consumers; practicing responsible marketing especially those aimed at children and teenagers; and ensuring the availability of healthy food choices and supporting regular physical activity practice in the workplace. In that picture, policymakers in OIC countries are responsible for designing policies to promote healthy diets, to encourage increased physical activity and regulate food industry for the benefit of their people.



CHAPTER 4

Maternal, Newborn, and Child Health and Nutrition

Health is vital for the well-being of all human beings. According to the definition of WHO, health does not only mean an absence of illness or disease, but it is a multidimensional concept that encompasses the state of physical, mental and social well-being of a person. Right to health is vital for everyone, but it is especially important for mothers and children because they are vulnerable and more at risk to illness and health complications. Maternal, newborn and child health (MNCH) basically refers to health of women and babies during pregnancy, childbirth and after childbirth. Provision of quality care during this period is very critical for the health and very survival of mother and infant.

4.1 Maternal Mortality

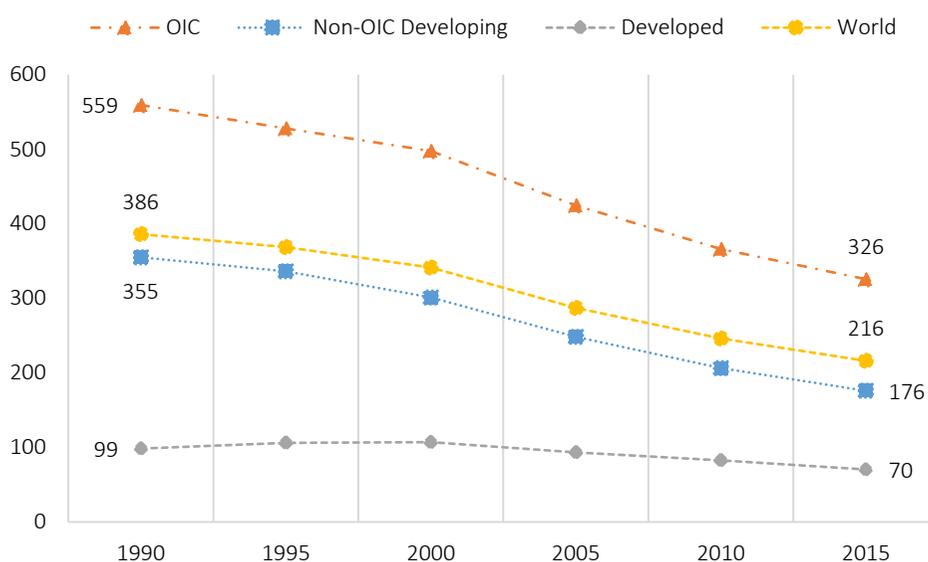
Maternal mortality remained significantly high in the developing world. According to the latest estimates of the WHO, nearly 300 thousand women died from preventable causes related to pregnancy and childbirth in 2015. Almost all of these deaths were reported in developing countries, especially in Sub-Saharan Africa and Asia. About 75% of all maternal deaths in the world are caused by five major complications during and after the pregnancy (WHO, 2014a) Maternal Mortality Fact Sheet No.348). Among these complications, severe bleeding (mostly bleeding after childbirth) is the top cause of maternal deaths, accounting for 27% of maternal deaths, followed by high blood pressure during pregnancy (14%), infections usually after childbirth (11%), complications from delivery (9%) and unsafe abortion (8%).

In OIC countries, about 149 thousand women died from preventable causes related to pregnancy and childbirth in 2015, corresponding to 49% of the world total maternal deaths. Maternal mortality remained highly concentrated in a handful of OIC countries. In 2015, almost half (49.7%) of the OIC's total maternal deaths were reported only in three countries, namely: Nigeria, Pakistan, and Indonesia. Among these high burden countries, Nigeria alone accounted for nearly two third (38.9%) of OIC total maternal deaths in 2015. Among others, Pakistan accounted for 6.5% followed by Indonesia (4.3%).



Under the MDG 5, all countries were committed to reducing maternal mortality by three quarters between 1990 and 2015. Efforts made to achieve this target have actually paid off and maternal mortality rate (MMR) has declined from 386 deaths per 100,000 live births in 1990 to 216 deaths in 2015, corresponding to a decrease by 44% (Figure 4.1). A similar trend can be observed for non-OIC developing countries with an overall decline of 50% in MMR. In line with the global trends, OIC countries also witnessed some improvement in maternal health conditions and MMR declined from 559 deaths in 1990 to 326 deaths in 2015, corresponding to a decrease by 42%. However, despite this improvement, MMR in OIC countries remained significantly higher than the averages of other groups.

Figure 4.1: Maternal Mortality Rate per 100,000 live births (1990-2015)

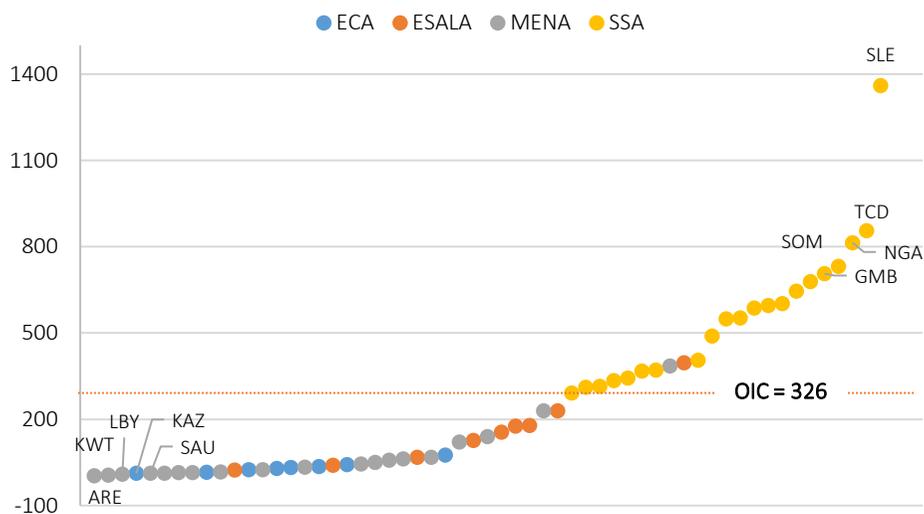


Source: SESRIC staff calculations based on World Health Organization Data Repository

At the individual country level (Figure 4.2), Sierra Leone recorded the highest MMR (1,360 maternal deaths per 100,000 live births), followed by Chad (856 deaths), and Nigeria (814 deaths). Among these countries, Sierra Leone is ranked 1st with respect to highest MMR in the world, Chad is ranked 3rd, and Nigeria is ranked 4th. In contrast, Kuwait recorded the lowest MMR with only 4 maternal deaths per 100,000 live births followed by United Arab Emirates (6 deaths), and Libya (11 deaths). Between 1990 and 2015, 25 OIC countries registered more than 50% decrease in MMR. Majority of these countries are from Middle East and North Africa (11 countries) and Europe and Central Asia (5 countries). On the other hand, two OIC countries namely Guyana and Surinam reported increase in MMR.



Figure 4.2: OIC Countries with the Lowest/Highest MMR, 2015

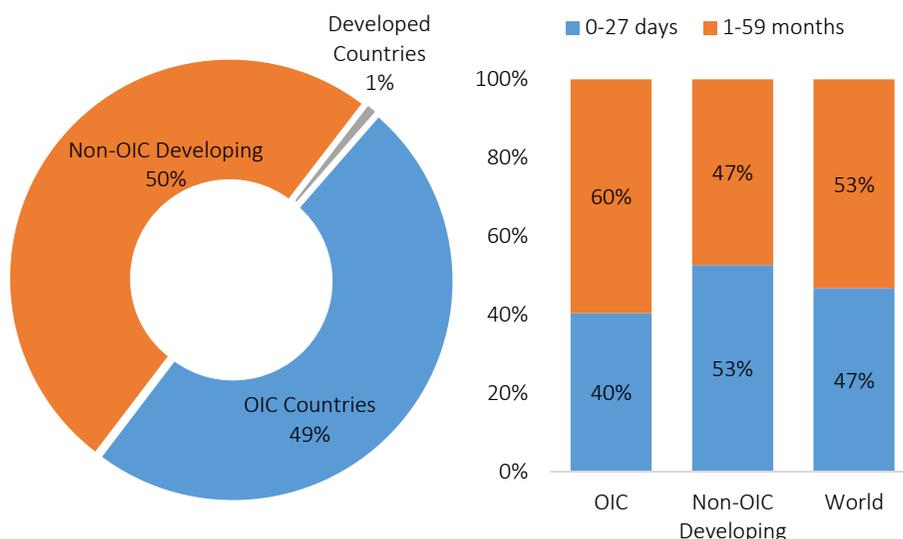


Source: SESRIC staff calculations based on WHO Data Repository

4.2 New-born and Child Mortality

The child mortality rate is the number of deaths of children under 5 per 1,000 live births. It is one of the most important indicators on the state of child health which basically reflects the overall coverage and effectiveness of health care services along with socio-economic development in a country. It was the benchmark indicator for the United Nations Millennium Development Goal 4, which set a target to reduce child mortality rate by two-thirds, between 1990 and 2015, the under-5 mortality rate (UN, 2014). Globally, around 5.4 million children died before reaching their fifth birthday in 2017. A child's risk of dying is highest in the neonatal period; the first 28 days of life. In 2017, 47% of under-five deaths were reported during the neonatal period. The Majority of these deaths can easily be prevented by ensuring access to effective safe childbirth and neonatal care services (WHO, 2015).

Under-five mortality remained highly concentrated in developing countries including OIC member countries, which accounted for over 99% of world total in 2017. Being a substantial part of the developing world, OIC countries accounted for 49% of the world total under-five deaths in 2017. Over 40% of child deaths in OIC countries occurred during the first month of life (Figure 4.3).

Figure 4.3: Distribution and Age Structure of Under 5 Deaths, 2017

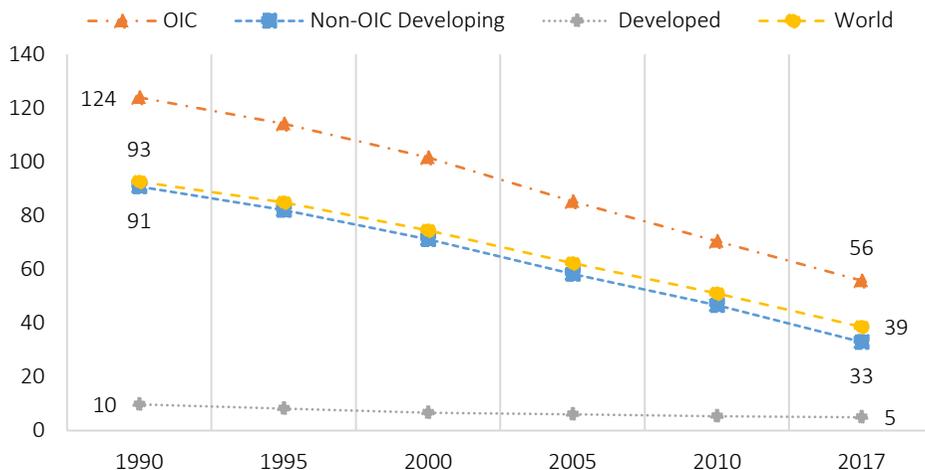
Source: SESRIC staff calculations based on UN Inter Agency Group for Child Mortality

Over the years, child mortality has shown a declining trend across the globe (Figure 4.4) where the average under-five child mortality rate (U5MR) has decreased by 54% since 1990 to 39 deaths per 1000 live births in 2017. Non-OIC developing countries also registered remarkable progress with 58% decline in U5MR since 1990. In line with the global trends, child mortality situation has also been improved in the OIC countries. Starting from a higher U5MR of 124 deaths per 1000 live births in 1990, OIC countries managed to reduce U5MR by 68% to 56 deaths per 1000 live births by 2017. Nevertheless, despite this improvement, OIC group made the least progress in reducing child deaths since 1990. As of 2017, one in 17 children in OIC countries dies before their fifth birthday compared to one in 30 in other developing countries and one in 25 children in the world.

At the national level, many OIC countries have made great strides against the child mortality over the last two decades. During 1990-2017, over two-third (66%) reduction was recorded in 20 OIC countries and in 10 countries the reduction was ranged between 50 to 65%. As of 2017, U5MR in OIC countries ranged from a low of 7 deaths per 1000 live births in Bahrain to a high of 127 in Somalia (Figure 4.5). Nine OIC countries have registered U5MR lower than 10 deaths per 1000 live births. In contrast, 6 OIC countries from SSA region registered U5MR higher than 90 deaths per 1000 live births. All of these six countries are ranked among the top-10 countries with the highest U5MR in the world. In 2017, Somalia was ranked 1st with respect to highest U5MR in the world followed by Chad (ranked 2nd), Sierra Leone (ranked 4th), Mali (ranked 5th), Nigeria (ranked 6th), and Benin (ranked 7th).

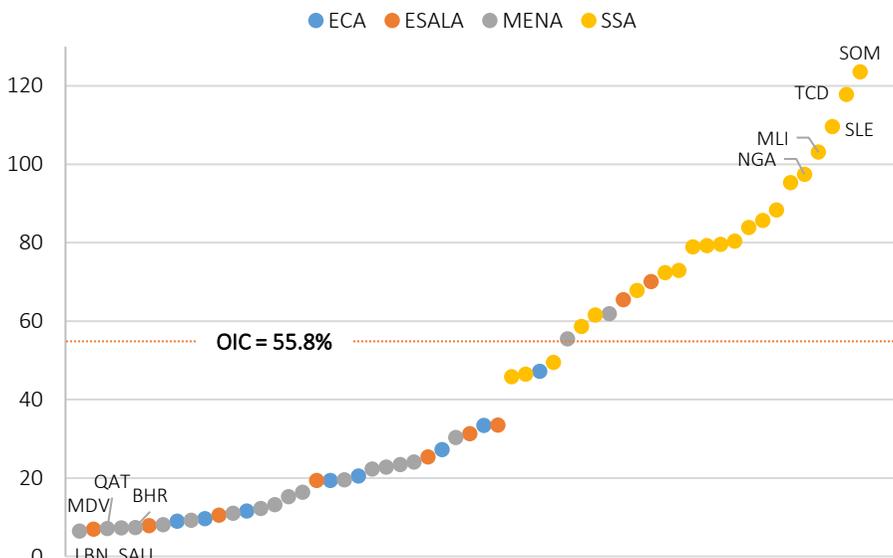


Figure 4.4: Under 5 Child Mortality Rate per 1,000 live births (1990-2017)



Source: SESRIC staff calculations based on UN Inter Agency Group for Child Mortality

Figure 4.5: OIC Countries with the Lowest and Highest U5MR, 2017

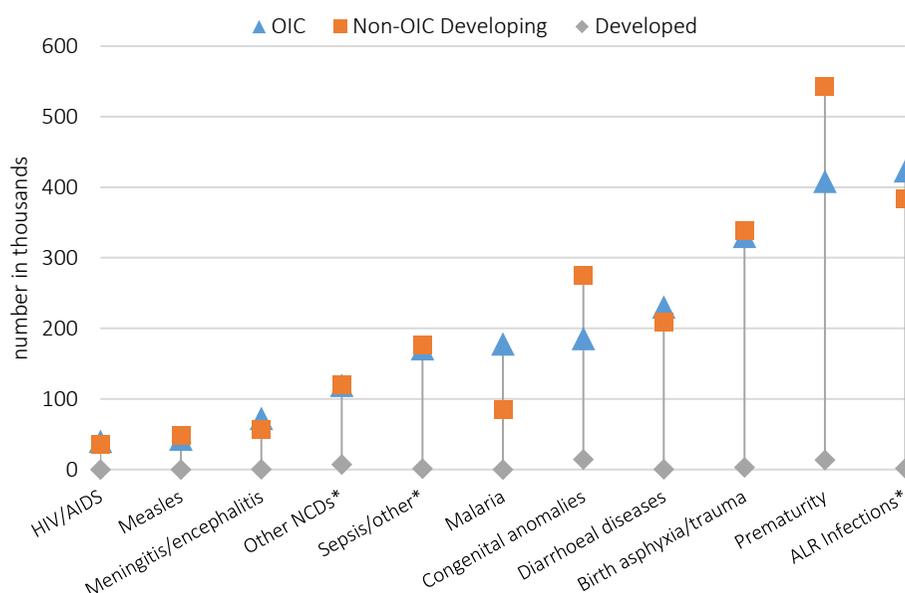


Source: SESRIC staff calculations based on UN Inter Agency Group for Child Mortality

4.3 Major Causes of Child Mortality

Globally, acute lower respiratory infections and prematurity related complications caused over one third of total deaths in children under five in 2017. In fact, these causes are largely preventable and/or treatable by ensuring access to simple and affordable interventions like vaccination, antenatal health care and skilled attendance of birth. As shown in Figure 4.6, prematurity was the largest single cause of death in children under five in 2017, and over 50% of under-five deaths were due to causes like pneumonia /sepsis (neonatal pneumonia), diarrhoea, congenital anomalies, and birth asphyxia/trauma related diseases. A similar situation is also observed in the case of non-OIC developing countries where leading causes of death among under-five children are prematurity, acute lower respiratory infections, birth asphyxia, and congenital anomalies. In contrast, causes of childhood deaths in developed countries are more skewed toward complications associated with pregnancy and delivery than the infectious diseases. The major causes of under-five mortality in OIC countries are similar to those in other developing countries. As shown in Figure 4.6, 37.8% of under-five deaths were caused by three infectious diseases: acute lower respiratory infections (19.2%), diarrhoea (10.5%) and malaria (8%). Among the pregnancy and birth related complications, prematurity (18.5%) remained the major cause of under five deaths followed by birth asphyxia (15%) and congenital anomalies (8.4%).

Figure 4.6: Major Causes of Child Mortality (number of deaths in thousands by cause), 2017



Source: SESRIC staff calculations based on World Health Organization Data Repository

*ALR Infections: Acute lower respiratory infections, Sepsis/other: Sepsis or other infectious conditions of the newborn, Other NCDs: Other non-communicable diseases.



4.4 Maternal, New-born and Child Health Care Services

Health experts are of the view that the majority of maternal and child deaths are preventable and interventions like antenatal care, skilled attendance during birth, immunization, and early care seeking for pneumonia, diarrhoea and malaria are critical for the survival and well-being of mothers and children. This sub-section examines the performance of the OIC countries in terms of the coverage of some of these selected interventions.

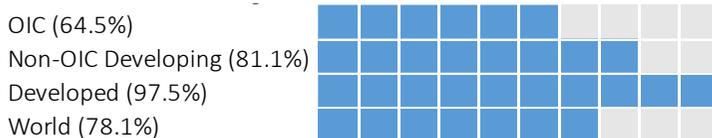
4.4.1 Antenatal Care

Antenatal care (ANC) and counselling is the entry point to the formal health care system and provides a solid base to monitor and improve the health of mother and baby by identifying and preventing/controlling antenatal complications at the earliest stage (WHO, 2010). Antenatal care (ANC) coverage measures the proportion of total pregnant woman aged 15-49 who visited a skilled health professional for reasons related to pregnancy. For the quality and effectiveness of ANC, number of visits and their timing is very important.

The provision of quality antenatal care remained a major concern in many OIC countries. During the period 2009-2018, around 64.5% of total pregnant women in OIC countries benefited from the recommended four antenatal checks up (Figure 4.7). The OIC median ANC coverage remained below the averages of the non-OIC developing countries and the world.

At the individual country level, more than 80% of pregnant women visited a health clinic four times in 14 OIC countries whereas; this ratio ranged from 50% to 78% in 24

Figure 4.7: Median ANC Coverage, 2009-2018*

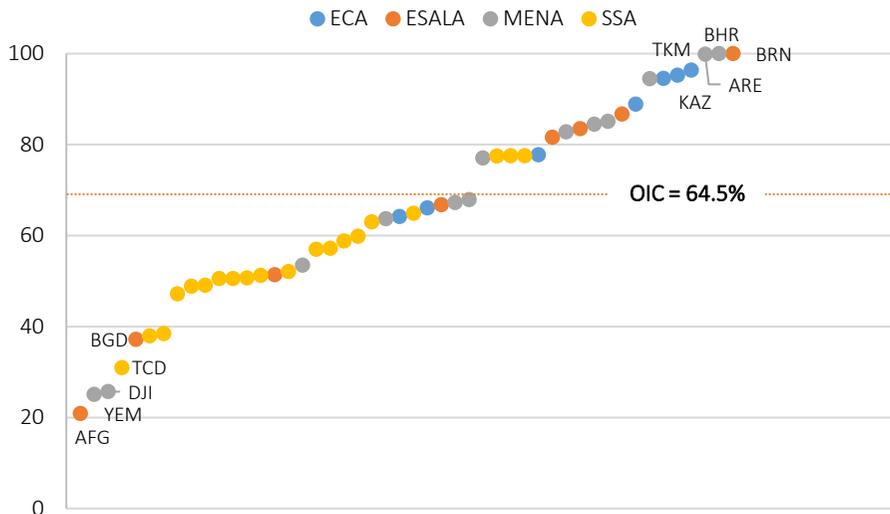


Source: World Health Organization Data Repository

* Most recent data available

other countries. Afghanistan, Yemen and Djibouti recorded the lowest ANC coverage rate where only 20.9%, 25.1% and 25.7% of women visited health facility four times during pregnancy, respectively (Figure 4.8). Overall, ANC coverage rate remained less than 50% in 10 member countries. Majority of the OIC countries with the lowest antenatal care coverage are located in the SSA region (11 countries).

Figure 4.8: Antenatal Care Coverage (% of women with at least 4 visits) in OIC Countries, 2009-2018*



Source: World Health Organization Data Repository

* Most recent data available

4.4.2 Births Attended by Skilled Health Personnel

Skilled health care and assistance at the time of delivery are critical for the health and very survival of both mother and baby. According to the latest estimates of the WHO, globally, about 2 million maternal and newborn deaths every year are caused by lack of proper health care during labour and childbirth. These deaths are largely preventable by ensuring assistance of skilled health personnel - a doctor, nurse or midwife - during the birth.

According to the latest estimates, globally around one fourth (20%) of births are still taking place without skilled assistance and care (Figure 4.9). Majority of these unassisted deliveries are occurring in developing countries. In 2005-2017, a doctor, nurse or midwife assisted 69% of deliveries in OIC countries. In contrast, this ratio was recorded at 84% in non-OIC developing countries and 80% in the world.

Figure 4.9: Births Attended by Skilled Health Personnel, 2005-2017*



Source: SESRIC staff calculations based on World Health Organization Data Repository, World Bank World Development Indicators, and UN World Population Prospects.

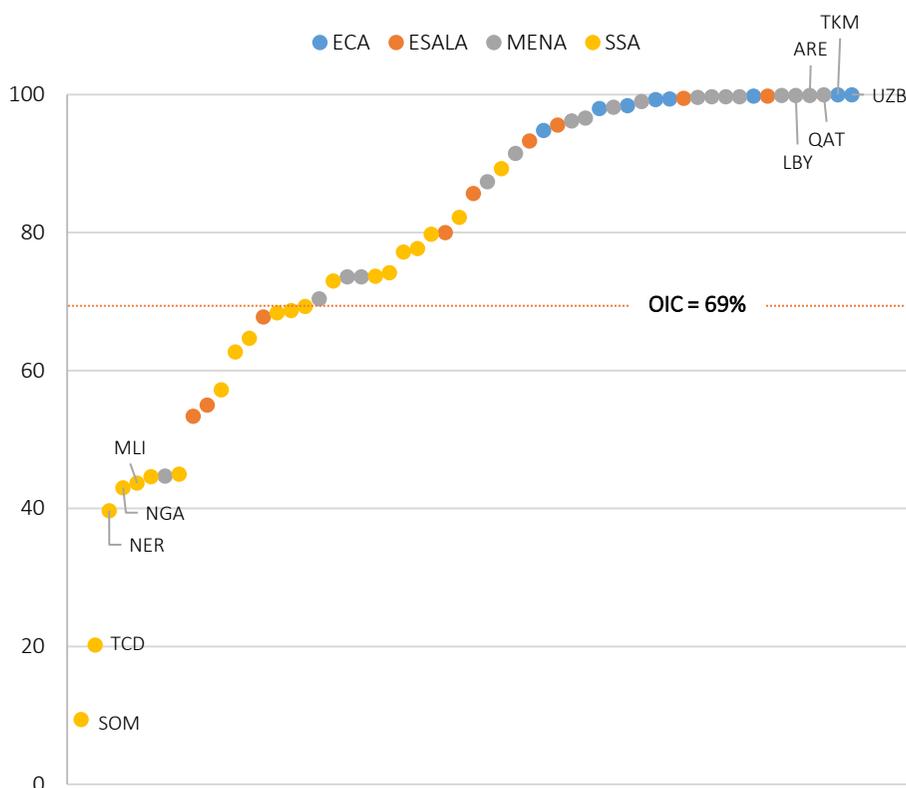
* Most recent data available

Over the years, the majority of OIC countries witnessed improvement in number of births



assisted by skilled health personnel. During 2005-2017, health personnel assisted more than 90% of deliveries in 25 member countries (Figure 4.10). Majority of these best performing countries are from the MENA (13 countries) and ECA (7 countries) regions. In contrast, less than half of total births were assisted by skilled health personnel in 8 OIC countries. The situation remained particularly alarming in Somalia and Chad where more than 70% of total births took place without any skilled health care and assistance at the time of delivery (Figure 4.10).

Figure 4.10: OIC Countries with the Highest and Lowest Percentage of Births Attended by a Skilled Health Personnel, 2005-2017*



Source: SESRIC staff calculations based on World Health Organization Data Repository, World Bank World Development Indicators, and UN World Population Prospects.

* Most recent data available

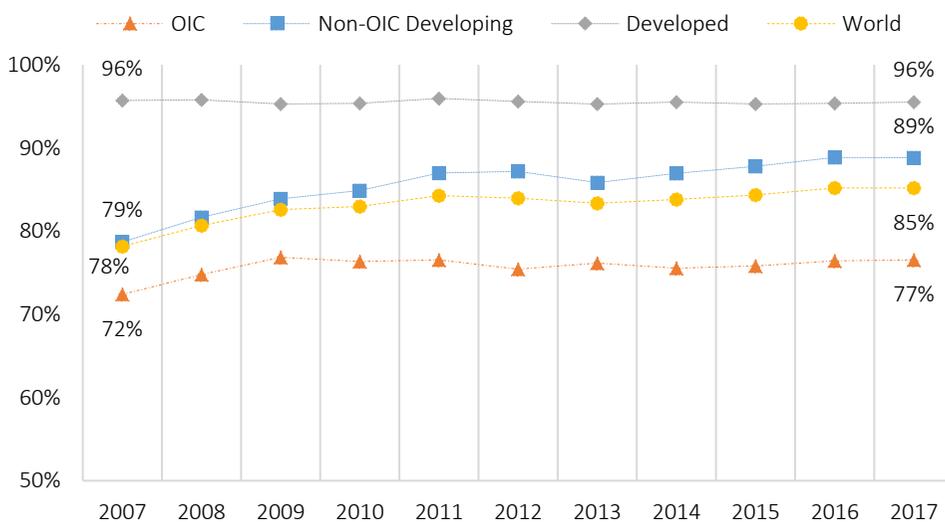
4.4.3 Immunization

Keeping in view the age-specific health risks, childhood immunization is one of the most efficient and effective methods of preventing diseases like measles, meningitis, diphtheria, tetanus, pertussis (whooping cough), yellow fever, polio and hepatitis b. Over the years,

serious efforts were exerted worldwide to develop and improve national immunization programmes and coverage by ensuring excess to needed vaccines and training for health workers. These noble efforts towards increasing immunization coverage helped to prevent millions of child deaths across the world.

Coverage of DTP3, a combination of vaccines against three infectious diseases: diphtheria, tetanus and pertussis (whooping cough), is used as the benchmark indicator of routine immunization programme in a country/region by the United Nations Children's Fund (UNICEF) and WHO (WHO, 2015a). Globally, DTP3 immunization coverage during the first year of life has increased from 78% in 2007 to 85% in 2017, corresponding to an increase of 7 percentage points (Figure 4.11). A similar trend prevailed in non-OIC developing countries with median immunization coverage climbing up from 79% in 2007 to 89% in 2017. OIC countries also witnessed improvement in DTP3 vaccination among one-year olds as their median coverage rate increased from 72% in 2007 to 77% in 2017. Though OIC coverage remained below the world and non-OIC developing countries median values, they are catching up rapidly with a five percentage point increase during 2007-2017.

Figure 4.11: DTP3 Immunization Coverage (2007-2017)



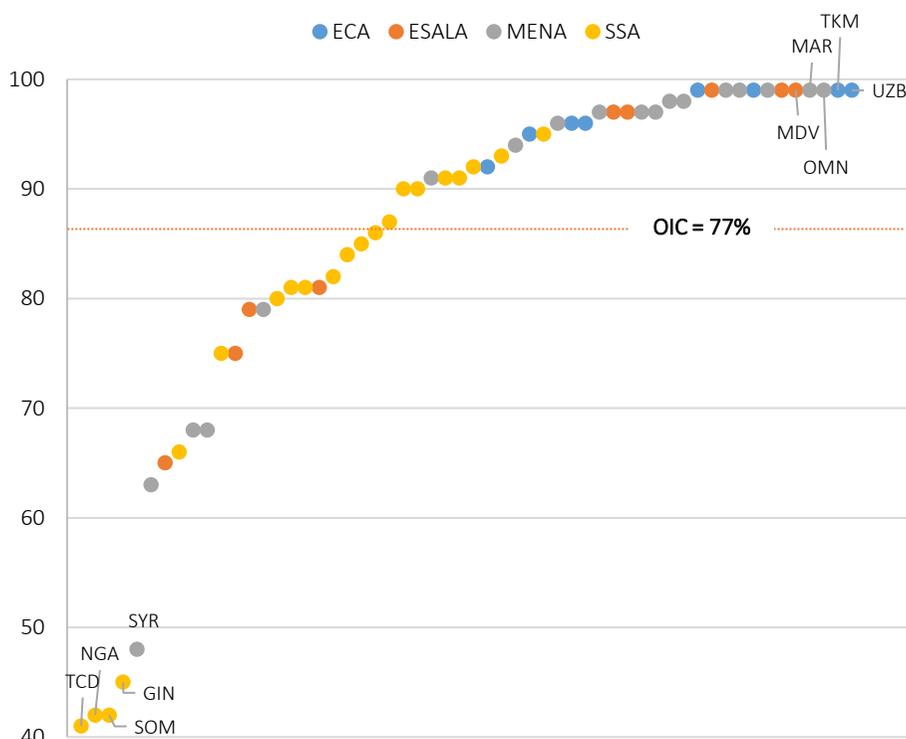
Source: SESRIC staff calculations based on World Health Organization Data Repository, World Bank World Development Indicators, and UN World Population Prospects.

DTP3 immunization coverage remained quite high in majority of OIC countries. In 2017, 33 OIC countries recorded coverage rate of 90% or more. Among these 30 countries, 12 OIC countries registered immunization coverage of 99% (Figure 4.12). Among others, 9 countries were within the 80-89% range and coverage rate remained between 70 to 79% for 4 other OIC countries. In contrast, about 50% of one-year-old children were not immunized against



DTP in 5 OIC countries. Among these countries, as shown in Figure 4.12, lowest coverage rate was recorded in Chad (41%) followed by Nigeria (42%) and Somalia (42%).

Figure 4.12: OIC Countries with the Highest and Lowest Percentage of DTP3 Immunization Coverage, 2017



Source: SESRIC staff calculations based on World Health Organization Data Repository, World Bank World Development Indicators, and UN World Population Prospects.

4.5 Prevention and Control of Infectious Diseases

Globally, over 33% of the total under-five deaths are caused by only three infectious diseases including pneumonia, diarrhoea, and malaria. The combined burden of these three diseases stands at around 30% of the total under-five deaths in non-OIC developing countries and over 37% in OIC countries (Figure 4.6). The majority of these deaths are preventable by using cost-effective, affordable and easy to implement measures.

Reduction of childhood mortality caused by acute respiratory infections remained an elusive goal mainly due to incomplete immunization schemes, malnutrition, late care seeking and inadequate treatment. The latest estimates show that 67.4% of children with symptoms of pneumonia in the world were taken to a health provider in 2010-2017. A similar situation

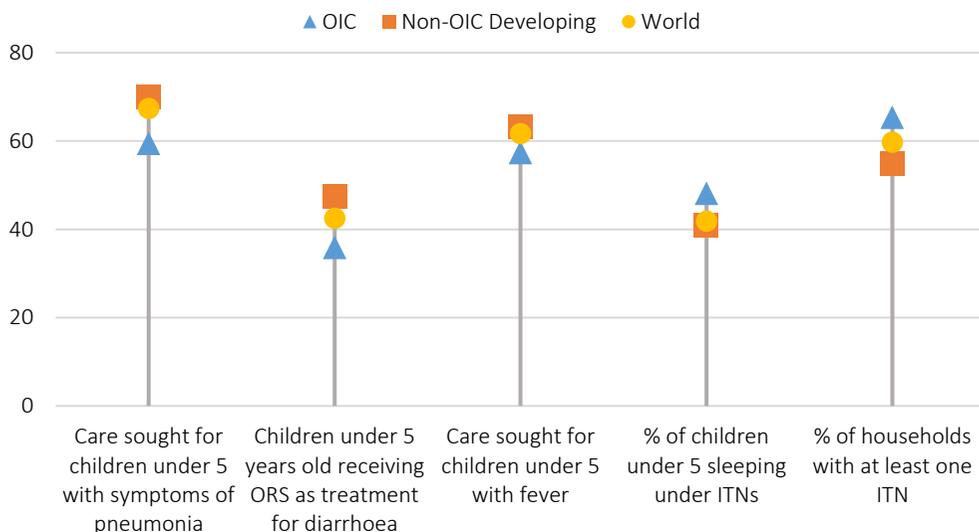
prevails both in OIC and non-OIC developing countries. Nevertheless, care seeking for pneumonia was comparatively high in OIC countries with a coverage rate of 59.5% (Figure 4.13).

Diarrhoea is another major killer of children, accounting for 9% of world’s total deaths of children under-5. Although childhood diarrhoea can be treated with a simple solution made from oral rehydration salts (ORS), just less than half of children (42.6%) with diarrhoea worldwide were treated with ORS in 2010-2017. The coverage rate was recorded at around 36% in OIC and 47.5% in other developing countries (Figure 4.13).

Globally, over 5% of total deaths in children are attributed to malaria. Most of these deaths occurred in OIC countries which accounted for 67.6% of the global burden in 2010-2017. Sleeping under insecticide-treated nets (ITNs) is the most effective way to prevent the malarial infection and reduce malaria related deaths. Worldwide, median number of children under sleeping under ITNs in 2010-2017 was 41.9%. Though median coverage rate remained comparatively better in OIC countries, still only 48% of total children were sleeping under ITNs (Figure 4.13). On average, over half of the total households had at least one ITN in non-OIC developing countries compared to the OIC average of 65.4%.

Deaths of children caused by pneumonia, diarrhoea and malaria remained highly concentrated in two OIC regions namely: Sub-Saharan Africa and South Asia. As of 2017, SSA region accounted for a majority of under-five deaths caused by malaria in OIC countries. Despite this heavy toll, recent estimates show that median coverage of ITNs extended to only

Figure 4.13: Median Coverage of Measures for Infectious Diseases, 2010-2017*

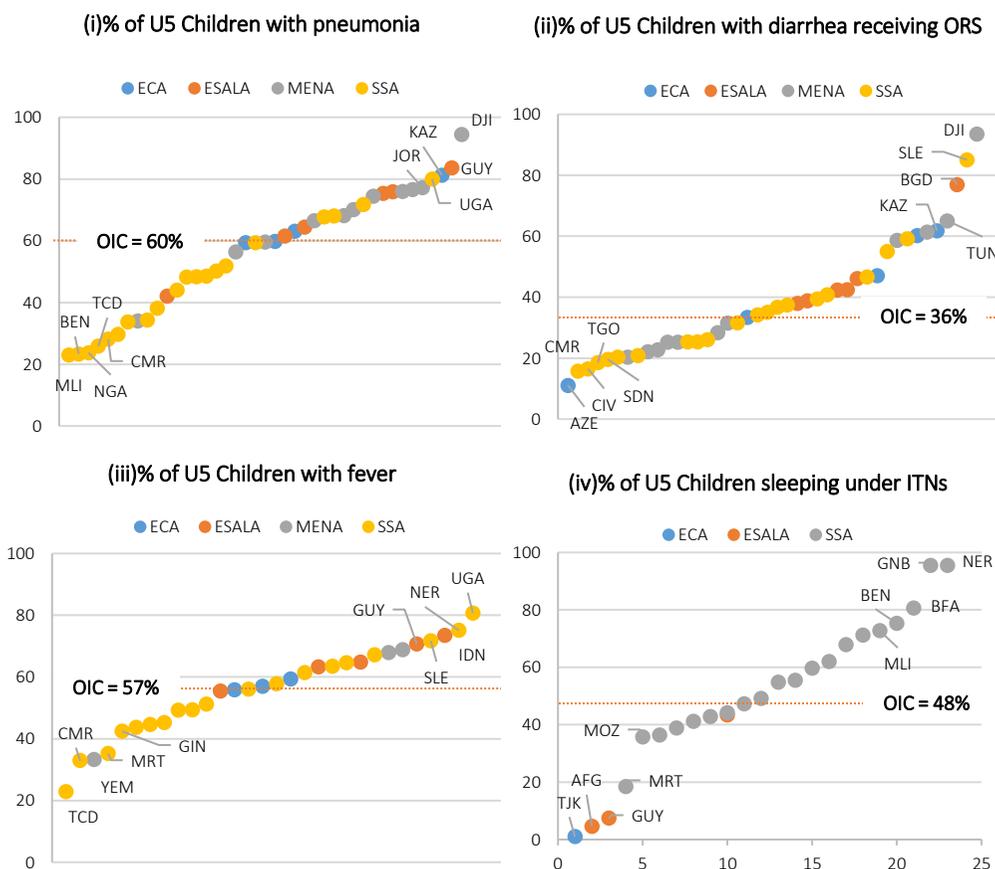


Source: World Health Organization Data Repository
 *Most recent data available



55% of children in this region and approximately 73% of households had at least one ITN. For many countries in SSA region, ITNs coverage remained even lower than the regional median value (Figure 4.14). Overall, the lowest median coverage was recorded in Mauritania where only 18% children were sleeping under ITNs followed by Mozambique (35.7%), and Chad (36.4%).

Figure 4.14: Median Coverage of Supplements in OIC Countries, 2010-2017*



Source: UNICEF data

*Most recent data available

In 2010-2017, a large number of diarrhoea-related child deaths in OIC countries were reported in various regions. Nevertheless, ORS treatment remained low with less than 50% median coverage in all four OIC regions. From the limited data available, median coverage for diarrhoea treatment with ORS extended to 28.4% of children in MENA, 32.9% of children in SSA, 42.4% of children in ESALA, and 47.1% of children in ECA region in 2010-2017. As shown in Figure 4.14 (ii), less than 30% of children with diarrhoea were treated with ORS in 16

countries, majority of which are from SSA region. Cameroon recorded the lowest coverage of ORS (15.8%) followed by Cote d'Ivoire (16.5%) and Togo (18.6%).

In case of pneumonia, the median coverage for children under 5 years of age differed within OIC regions. Once children develop symptoms of pneumonia, early care seeking, and prompt treatment can save their lives. Yet in 2010-2017, the median coverage for treatment sought for symptoms of pneumonia was recorded to be the lowest in SSA at 46%, followed by ECA (61.3%), ESALA (69.8%), and MENA (70.1%). At the individual country level, as shown in Figure 4.14, more than two thirds of children with pneumonia were taken to a health provider in four OIC countries namely: Gabon (67.7%), Gambia (68%), Sierra Leone (71.7%), and Uganda (80%). On the opposite side of the scale, care seeking for pneumonia remained lowest in Mali (23%) followed by Benin (23.3%), and Nigeria (23.7%).

4.6 Nutrition

Proper child nutrition is one of the most powerful tools to raise a healthy and productive generation. It helps not only in improving children's chances of survival during the early years of life but also contribute towards their physical and cognitive development. On the other hand, malnutrition not only increases the risk of child death from common illness such as diarrhoea, pneumonia, and malaria but can also lead to stunted growth, which is irreversible and associated with impaired cognitive ability and reduced school and work performance. According to the UNICEF (2013a), nutritional status of children is assessed through measurement of their weight and height. The most commonly used indicators of nutritional status are stunting, underweight, wasting, and overweight.

4.6.1 Incidence of Malnutrition

The latest estimates of the WHO show that about one in four children or approximately 149 million children under 5 worldwide, mostly from developing countries, have stunted growth in 2018. Furthermore, approximately 49 million children suffered from wasting. OIC countries bear 31% of global burden of stunted children in 2010-2018 as shown in Figure 4.15. In comparison, around 27% in other developing countries and in the world. Among the OIC regions, highest prevalence of stunting was recorded in ESALA (36.4%), followed by SSA (36.3%), MENA (19%), and ECA (11.1%). Distribution of stunted children remained highly uneven across the OIC countries and more than half of OIC's stunted children were living in four countries namely: Nigeria (21.4% of OIC total), Pakistan (14.7%), Indonesia (13.6%) and Bangladesh (8.6%).

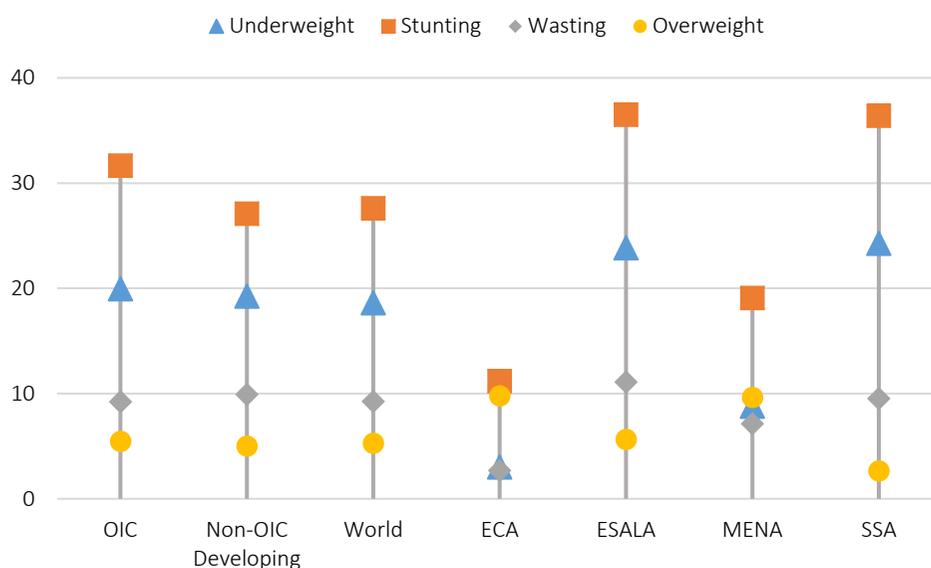
In 2010-2018, 18.6% children under five years of age in the world were underweight. Among the developing countries, non-OIC developing group accounted for the highest share of underweight children (63%) followed by OIC countries (37%). As shown in Figure 4.15, the proportion of children under five years' old who were underweight was recorded at 19.9% in OIC countries followed closely by the other developing countries (19.2%). Among the OIC regions, as shown in Figure 4.15, underweight prevalence remained the highest in SSA



(24.2%), followed by ESALA (23.8%) and MENA (8.7%). In terms of absolute numbers of underweight children, SSA and ESALA were home to more than 80% of total underweight children in OIC countries. About two third of underweight children in OIC countries were living only in five countries namely: Nigeria (24.6% of OIC total), Pakistan (14.3%), Bangladesh (12.3%), Indonesia (11.8%) and Sudan (4.8%).

Wasting is a major health problem. Globally, more than 49 million children under 5 years of age were moderately or severely wasted in 2018, accounting for about 7.3% of children in the world. As shown in Figure 4.15, wasting prevalence remained more or less the same in OIC and other developing countries with a rate of 9.2% and 9.9%, respectively. Among the OIC regions, wasting is more prevalent in ESALA, where approximately one in every six children (11%) is moderately or severely wasted (Figure 4.15). A similar situation exists in SSA region. The burden of wasting is highest in ESALA and SSA regions, which accounted for 83.7% of total wasted children in OIC countries (with 42.8% living in ESALA and 40.9% in SSA). It is worth noting that more than half of OIC total wasted children were living only in four countries namely: Nigeria (18.2%), Indonesia (17.4% of OIC total), Bangladesh (11.7%) and Pakistan (9.5%).

Figure 4.15: Nutritional Status of Under 5 Children (percentage), 2010-2018*



Source: SESRIC staff calculations based on UNICEF data

*Most recent data available

Childhood overweight and obesity is on rise across the globe especially in the developing world. There are serious health consequences for childhood overweight and obesity including cardiovascular disease, diabetes, and many cancers. Globally, approximately 5.9% of children

under 5 were overweight. Though overweight was once associated mainly with high-income countries, the number of overweight children under five has tripled between 2000 and 2018 in Eastern Europe and Central Asia. As of 2010-2018, the prevalence of overweight among children remained higher in OIC countries (5.4%) than the other developing countries (4.9%). Overweight prevalence remained highest in ECA and MENA regions (Figure 4.15). These two regions accounted for 44% of the OIC burden of overweight children (with 36.8% of OIC total living in ESALA and 33.3% in MENA). At the country level, the highest proportion of the OIC's total overweight children (25%) lives in Indonesia followed by Egypt (16.8%) and Turkey (6.6%).

4.6.2 Feeding Practices

Proper feeding especially during the first two years of life is critical for a child's survival, growth and development. Regarding best child feeding practices, international health agencies like UNICEF and WHO recommend that infants should be breastfed within one hour of birth, breastfed exclusively for the first six months of life and continue to be breastfed up to 2 years of age and beyond. Starting at 6 months, breastfeeding should be combined with safe, age-appropriate feeding of solid, semi-solid and soft foods. According to the recent findings of UNICEF (2013), implementation of these interventions could reduce the global deaths of children under-5 years of age by 20%.

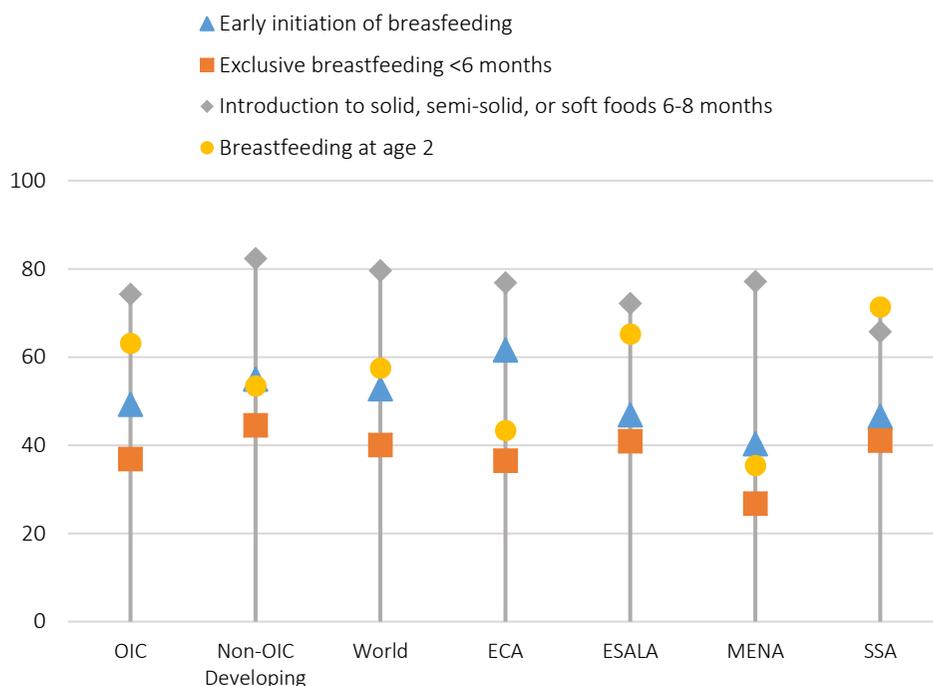
The latest estimates on feeding practices among infants and young children reveal that in spite of its crucial importance for child nutrition a significant number of infants and children are not breastfed. Globally, only 52.8% infants were breastfed within one hour of birth and 40% were exclusively breastfed for 0-5 months (Figure 4.16). In line with the global trends, median coverage of infant and child feeding practices remained more or less similar both in OIC and non-OIC developing countries. In OIC countries, a median of 49.3% of infants were put to the breast within first hour of birth, and 36.9% were exclusively breastfed during the first six months of life. The coverage of breastfeeding until age 2 remained comparatively better in OIC countries with a median 63.1% of children breastfed until age 2. The estimates for appropriate feeding of children with adequate and safe complementary food reveal that a median of 74.2% of infants in OIC countries were introduced to solid, semi-solid or soft foods at 6 to 8 months. Coverage for introduction of complementary food for infants remained more or less the similar both in the world and non-OIC developing countries. In general, OIC countries average for the early initiation of breast and exclusive breastfeeding for six months remained visibly lower than the non- OIC developing countries averages (Figure 4.16).

Coverage of recommended breastfeeding practices varies substantially among the OIC regions (Figure 4.16). The share of infants which are breastfed within one hour of birth ranges from 46.5% in SSA to 61.6% in ECA region. On the other hand, in terms of continued breastfeeding at 2 years of age, coverage ranges from 35.4% in MENA to 71.4% in SSA region. In general, data from three indicators relating to breastfeeding reveals that a significant number of children remained vulnerable to malnutrition in all OIC regions. Regarding the



introduction of complementary food, MENA region registered the highest coverage rate of 77.1% whereas, more than half of infants were introduced to solid, semi-solid or soft foods at 6 to 8 months in SSA, ECA and ESALA regions (Figure 4.16).

Figure 4.16: Median Coverage of Child Feeding Practices (percentage), 2010-2018*



Source: SESRIC staff calculations based on UNICEF data

*Most recent data available

4.7 Micronutrient Deficiencies

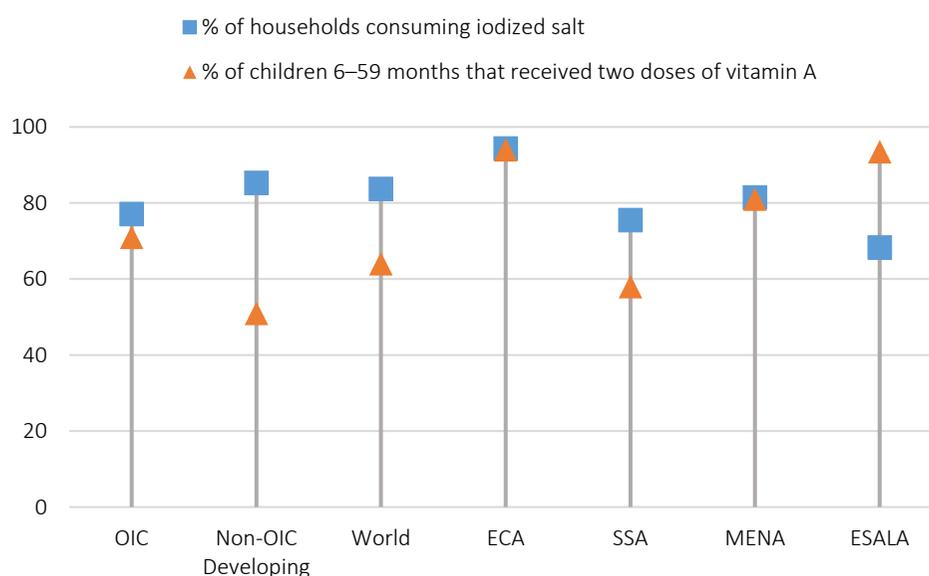
Micronutrient deficiencies like deficiencies of vitamin A, iron, iodine, zinc and folic acid are very common among women and children in low income developing countries, including some OIC countries. While efforts to improve the nutritional status of children through breastfeeding and complementary feeding are crucial, interventions like supplementation are regarded as a fast-track approach to improve the intake of vital micronutrients among women and children. This sub-section presents a brief overview of efforts exerted by OIC countries to improve the micronutrient deficiencies among children.

4.7.1 Vitamin A Supplement

According to the WHO (2015c), vitamin A deficiency is a public health problem especially in Africa and South-East Asia. It is not only the leading cause of preventable blindness in children, but it also increases the risk of disease and death from severe infections. Globally, about two-

third (64%) of children aged 6 to 59 months received two doses of vitamin A in 2010-2017 (Figure 4.17). Median coverage for vitamin A supplementation remained highest in OIC countries where 71% of children received two doses of vitamin A. Non-OIC developing countries registered comparatively low median coverage of 51%. Vitamin A supplementation coverage varies greatly across the OIC regions. In 2010-2017, ECA registered the highest median coverage rate of 94% followed by ESALA (93.5%) and MENA (81%). In contrast, children remained most vulnerable to vitamin A deficiency and hence blindness in SSA, with more than half of children aged 6 to 59 months did not receive two doses of vitamin A (Figure 4.17).

Figure 4.17: Median Coverage of Vitamin A Supplement and Median Iodized Salt Consumption in Households (%), 2010-2017*



Source: UNICEF data

*Most recent data available

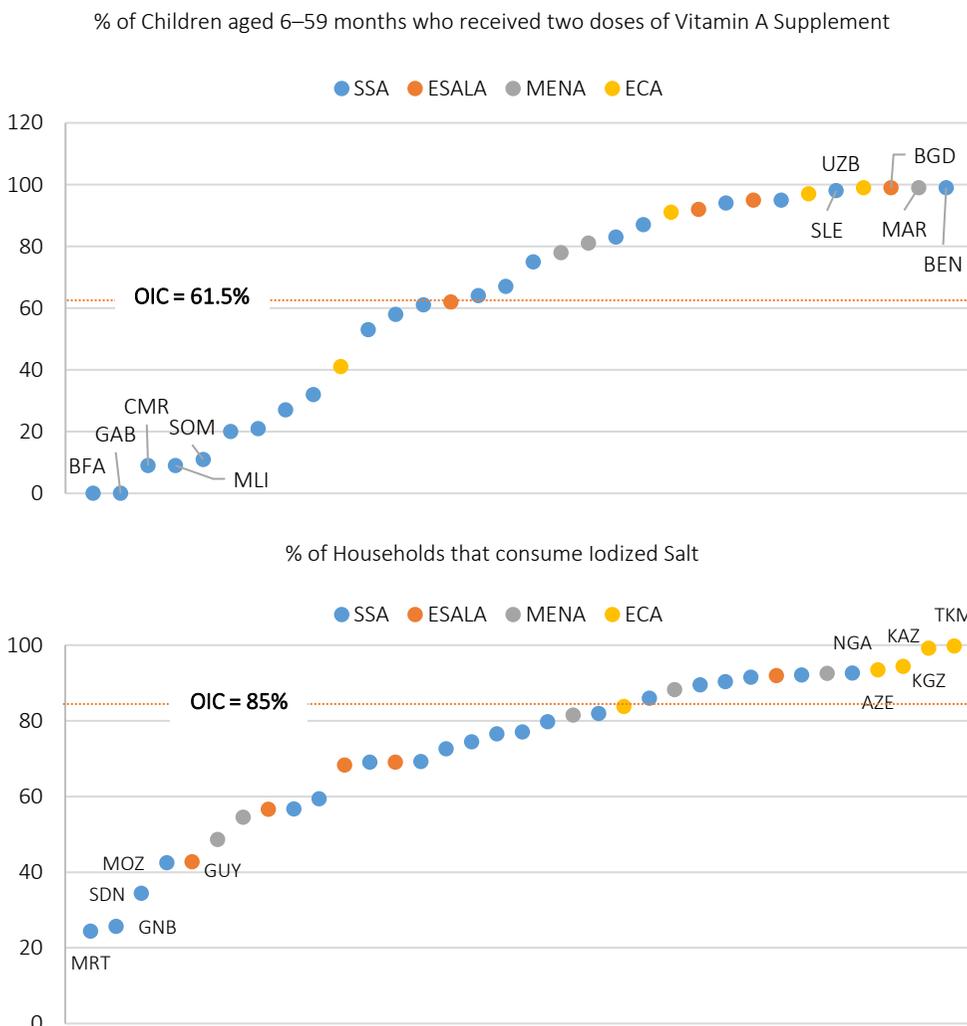
4.7.2 Iodized Salt Consumption

Consumption of adequately iodized salt is another major intervention to prevent and improve the iodine deficiency and its consequences. Iodine is critical for foetal development. If mothers do not have adequate iodine intake, babies may develop a form of mental retardation called cretinism (WHO, 2015c). As a result, it does not only affect children's performance at school but also affects their productivity and the ability to find a job in adulthood. Consumption of salt with any iodine can prevent major causes of mental retardation and other iodine deficiency disorders. Globally, nearly 86% of the population had access to iodized salt in 2018. According to the latest estimates, globally, 83.7% of households consumed salt with any iodine (>0 parts per million or more), but coverage varies considerably



among the developing countries (Figure 4.17). Non-OIC developing countries registered the highest coverage, with 85.3% of households consuming salt with any iodine. In contrast, only 77.1% of households were consuming salt with any iodine in OIC countries. Consumption of salt with any iodine in households across the OIC regions also varied with the highest number of households in ECA (94.4%), followed by MENA (81.5%), and SSA (75.5%). The lowest household consumption of salt with any iodine was reported in ESALA at 68.3%.

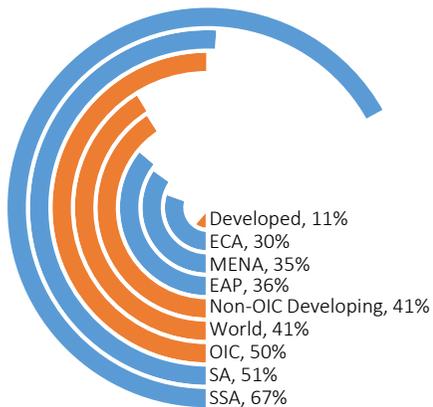
Figure 4.18: Median Coverage of Supplements in OIC Countries, 2010-2017*



Source: UNICEF data

*Most recent data available

Figure 4.19: Prevalence of Iron Deficiency Anemia, 2016



Source: SESRIC staff calculations based on World Bank, WDI

coverage remained less than 50% in Sudan (34.4%), Mozambique (42.4%), Guyana (42.7%), and Yemen (48.6%).

4.7.3 Iron Deficiency Anaemia

Iron deficiency is one of the most common and widespread nutritional disorders in the world. However, it is mostly prevalent among children and women in low income developing countries, though it is the only nutrient deficiency which is also significantly prevalent in developed countries as well. Iron deficiency is indicated as the most common cause of anaemia in women and children. During pregnancy, iron deficiency can be harmful to mother and child, resulting in birth complications, increased risk of maternal mortality and impaired physical and mental development of child (UNICEF, 2004).

According to the latest estimates, over 41% of children under the age 5 were anaemic in 2016. While prevalence of anaemia was just 11% for developed countries, the numbers were staggering in non-OIC developing and OIC countries with 41% and 50% of children suffering from anaemia, respectively (Figure 4.19). Among the OIC region, anaemia in children remained a major health challenge in Sub-Saharan Africa and South Asia. These two regions accounted for over 70% of total anaemic children in OIC countries. As shown in Figure 4.19, about 67% of children were suffering from anaemia in SSA and 51% in SA region. In contrast, less than 40% of children were anaemic in other regions.

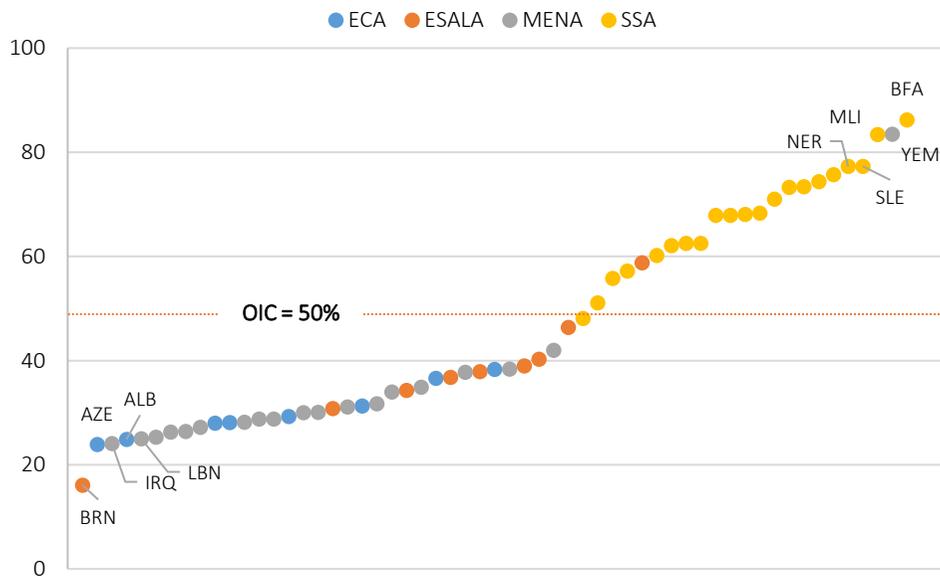
Looking at the individual countries, as shown in Figure 4.20, Brunei recorded the lowest prevalence of anaemia among children (16%) followed by Azerbaijan (24%) and Iraq (24%). On the opposite side of the scale, prevalence remained highest in Burkina Faso (86%) followed

At the individual country level, 14 out of 32 OIC countries, for which the data are available, had reached the universal target of 80% median coverage for vitamin A supplementation. Among these 14 countries, coverage remained over 90% in 11 OIC countries from ECA, ESALA, and MENA regions (Figure 4.18). For household salt consumption, among the 35 OIC countries for which the data are available, 10 countries managed to exceed the global target of 90% median coverage. Among others, consumption of iodized salt ranged from 50 to 89% in 19 OIC countries. For 11 of these countries coverage remained over 70%. On the other hand, median coverage statistics show that in Mauritania and Guinea-Bissau less than 30% of households were consuming salt with any iodine in it. The median



by Yemen (84%) and Mali (83%). In general, more than half of the children were anaemic in 22 OIC countries, 20 of them from SSA region.

Figure 4.20: OIC Countries with Highest and Lowest Anemia Prevalence, 2016



Source: World Bank, WDI

CHAPTER 5

Medicines, Vaccines, and Medical Technologies

The role of medicines, vaccines and medical technologies in supporting the development of healthy societies is of paramount importance. More precisely, the pharmaceutical industry constitutes one of the essential elements of an effective and well-functioning healthcare system. Pharmaceutical products, such as medicines and vaccines, are fundamental and require appropriate financing. Medical devices are also important to provide health care and to improve the health of individuals and populations. One of the WHO's strategic objectives is to ensure improved access, quality and use of medical devices.

In the view of the above, this section describes the current situation of medicines, vaccines as well as medical technology in OIC countries.

5.1 Pharmaceutical Industry

Today pharmaceuticals have become an indispensable part of health care system around the globe. Historically pharmaceuticals have played a vital role in the human development by improving the quality of life and reducing the time spent in the hospitals. Thanks to innovative pharmaceutical industry that almost all epidemics and chronic diseases are curable today. Due to its direct link with the welfare and wellbeing of human beings, pharmaceutical industry is of strategic importance for the development of a healthy and productive nation. Pharmaceutical industry is considered to be one of the largest and rapidly growing global industries. It is a major source of employment generation and foreign exchange earnings for many countries around the globe.

However, despite all these extraordinary achievements, it's a harsh reality that annually more than 2.3 million people die across the world (WHO, 2011), mostly in low income developing countries, due to unavailability and inaccessibility of necessary medicines. Many developing countries, including some OIC members, has insufficient or no manufacturing capacities in the

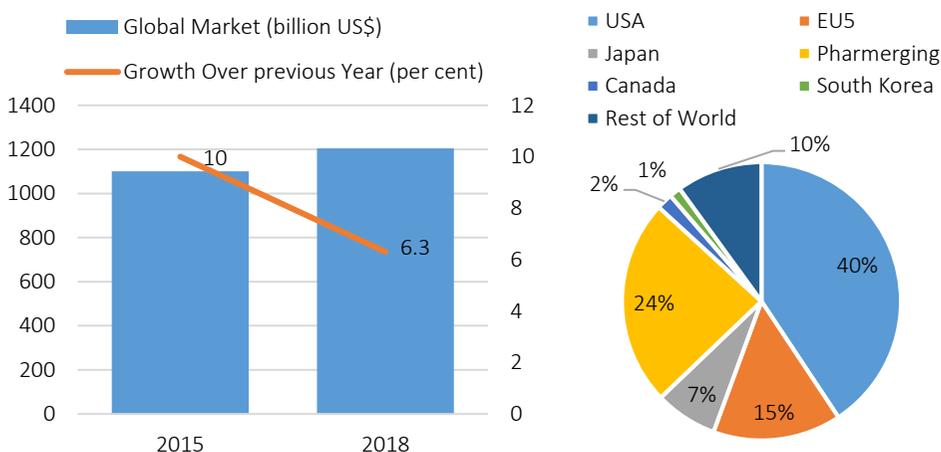


pharmaceutical industry. Local industry covers a tiny fraction of domestic pharmaceutical demand and they rely heavily on imports and medicinal aid. In addition, the share of medicines in “out-of-pocket” health payments (i.e. paid by the patient) is ranging between 40 to 60% in these countries. Consequently, medicines are neither available nor accessible to a large fraction of population and hundreds and thousands of people die of preventable and treatable diseases. This section attempts to investigate the availability of medicines in OIC countries by focusing on the production, consumption and trade patterns of pharmaceuticals in these countries based on the most recent available datasets.

5.1.1 Global Production and Consumption

The global pharmaceutical industry has shown rapid growth over the years and emerged as one of the fastest growing industries in the world. However, world pharmaceutical production and consumption is dispersed unevenly around the world. Developed countries are both leading producers and consumers of pharmaceuticals. According to IQVIA (2019) (an international consulting and data services company), the volume of pharmaceutical industry surged from US\$ 1,100 billion in 2015 to US\$ 1,205 billion in 2018. During this period, the industry’s growth rate (compared to previous year) witnessed a declining trend from 10% in 2015 to 6.3% in 2018. This decline is mainly associated with the slowdown in economic activity, especially in the developed countries, which consume a large chunk of global pharmaceutical products. Since 2008, economic slowdown in developed countries culminated into one of the worst global financial and economic crisis since the Great Depression. The negative effects of this meltdown of historic magnitude were felt across the globe and all sectors were hard hit. Following the restoration period, the uncertainties in the global economy and global imbalances that mostly hit emerging markets remain amongst major challenges that limit the growth trajectories of the pharmaceutical industry (Figure 5.1).

Figure 5.1: Global Pharmaceutical Market and Regional Distribution



Source: SESRIC staff calculations based on IQVIA Human Institute 2019 Report

According to the estimations of IQVIA, the global pharmaceutical market will exceed US\$ 1.5 trillion by 2023 growing at a 3–6% compound annual growth rate over the 2019-2023. The key drivers of growth will continue to be the United States and pharmerging markets with 4–7% and 5–8% compound annual growth, respectively (IQVIA, 2019).

Population growth, aging population, and improved access in pharmerging markets will continue to be amongst major growth factors in the globe in near future. The global pharmaceutical market, both in terms of production and consumption, is highly concentrated in the developed regions. In 2018, the USA accounted for the highest share (40%) of global spending, followed by pharmerging markets (24%) and EU 5 countries (Germany, France, Italy, UK, and Spain) (15%). Pharmerging markets include China, Brazil, India, Russia, Mexico, Turkey, Poland, Saudi Arabia, Indonesia, Egypt, Philippines, Pakistan, Vietnam, Bangladesh, Argentina, Algeria, Colombia, South Africa, Chile, Nigeria, and Kazakhstan. While rest of the world, mostly developing regions, accounted for only 10% of global pharmaceutical consumption.

5.1.2 Production and Consumption in OIC Countries

Like many other developing countries, the OIC member countries are facing many socio-economic challenges including the establishment of an efficient and effective health care system. In these countries, health sector is still suffering from many problems ranging from poor infrastructure to insufficient number of medical staff. However, the shortage of and inaccessibility to necessary medicines are among the most challenging problems. Due to the unavailability of the relevant data on most of the OIC countries, comprehensive and comparative analysis on production capacity of pharmaceutical industry at the OIC level is not possible. However, an overview of pharmaceutical industry in the OIC countries, for which the data are available, in terms of their geographical regions is given in the following section.

Middle East and North Africa (MENA)

Economic development is changing the health profile in the MENA region, with the increasing prevalence of communicable diseases. In this context, international companies recognize the value and potential of the MENA region. For example, Sanofi is the largest pharmaceutical company in Morocco, whilst GlaxoSmithKline is the leader in Saudi Arabia. Moreover, some local producers such as Hikma from Jordan and SPIMACO from Saudi Arabia aim to become regional leaders. Pharmaceutical sales in the MENA region were estimated around US\$ 35.8 billion at retail prices in 2016, including pharmacy and hospital sales. Turkey, Egypt and Saudi Arabia are the main players in the MENA region.

The Egyptian pharmaceutical market grew at a compound annual growth rate (CAGR) of 17% between 2011 and 2017 to reach a total market valuation of EGP 50 billion in 2017. However, per capita consumption is still low. In spite of recent production problems, production is expected to rise as the healthcare system continues its transition towards modernization. Egypt is becoming a very attractive market for multinational pharmaceutical companies among pharmerging markets.



Jordan has a relatively strong level of domestic production. However, the majority is exported which results in a market dependent on imports. Most imported pharmaceuticals are retail medicaments from countries located in the Western Europe, such as Switzerland and Germany. On the other hand, exports are primarily semi-finished and retail medicaments destined for other countries in the MENA region. The largest pharmaceutical company in Jordan is Hikma Pharmaceuticals, with a market share of over 10%. The company has a number of manufacturing facilities in Jordan, as well as R&D facilities. In 2010, Hikma acquired an injectable business from a US company that significantly enhanced the scope of the company's injectable business worldwide. Hikma also acquired an Algerian company as well as a Tunisian company in 2010, strengthening its presence in the MENA region.

Although the Moroccan pharmaceutical market is small in global terms, per capita spending on pharmaceutical products is comparatively high for an African country. Over 50% of the pharmaceutical companies are owned by foreign interests, accounting for more than half of industry turnover. Multinationals with a strong presence in the Moroccan pharmaceutical market include Sanofi, GlaxoSmithKline and Pfizer. Hikma has also increased its market penetration, following the acquisition of 63.9% of Promopharm. The pharmaceutical market evolved positively, reaching US\$ 1.48 billion sales in 2017 with forecasts of US\$ 1.9 billion in 2021 at a yearly expansion of 6.7% CAGR.

The Saudi pharmaceutical market is the richest in the Gulf region. The private pharmacy sector tends to favor branded pharmaceuticals, but it is marked by price controls. The key players in the Saudi Arabia pharmaceutical market include Novartis AG, SPIMACO, Pfizer Inc., and Glaxosmithkline plc., Jamjoom Pharma, and Tabuk Pharmaceutical Manufacturing Co. among others. Public sector, more generic-led, is dependent on oil revenues and is characterized by cost-containment. There is little domestic production in Saudi Arabia, therefore the vast majority of the market is provided by imports. There are only a few major domestic manufacturers in the country. Locally made pharmaceuticals supply only around 15% of the market, and the rest of the output is mainly exported to other GCC.

Asia

In the Central Asian region, Turkey emerged as a promising pharmaceutical market. Today, Turkey is one of the largest pharmaceutical producers in the group of OIC countries. There are 69 pharmaceutical manufacturing companies operating in Turkey where 15 of them are multinational companies. Turkey also host 10 raw material producing companies for the pharmaceutical industry where 3 of them are multinational companies. There are 25 Research and Development (R&D) Centers serving to the needs of the pharmaceutical industry. The Turkish pharmaceutical market grew by 16.5% in 2016 and sales reached TL 20.7 billion, with 7.6% CAGR during 2011-2016.

Turkish pharmaceutical industry and market has great growth potential and is placed in a group of countries called "Pharmerging Markets" which represents fastest growing pharmaceutical markets in the world. The pharmerging markets are 21 countries identified

by IQVIA Health as having more than US\$1 billion in pharmaceutical spending growth from 2014 to 2019 and a per capita GDP of less than US\$ 30,000. Among these pharmerging markets, Turkey, Saudi Arabia, Indonesia, Egypt, Algeria, Bangladesh, Nigeria, Kazakhstan and Pakistan are OIC countries.

In the Asia Pacific, Malaysia is one of the fastest growing pharmaceutical markets valued around US\$ 1.6 billion in 2012. According to Malaysian Drug Control Authority, in 2012 there were 235 registered pharmaceutical companies in the country and local manufacturer produced about 25-30% of domestic demand. Provided the rich natural resources (flora and fauna), Malaysia is envisaged as an important bio generic (herbal medicines and vitamins) market in the region. Malaysia has designated healthcare as one of the country's twelve National Key Economic Areas (NKEA), placing a particular emphasis on pharmaceuticals. The government is encouraging private investments as well as more public-private collaborations in the pharmaceutical sector.

Indonesia is another growing pharmaceutical market in the region. In 2016, Indonesia's pharmaceutical market was worth over US\$ 6 billion, and it is expected to more than double by 2020. According to Drug and Food Control Agency (BPOM), Indonesia has a strong pharmaceutical manufacturing industry based on 108 companies. In 2012, local companies accounted for 75% of sales of medicines in the country. Several foreign pharmaceutical companies have offices and manufacturing facilities in Indonesia. According to the International Pharmaceutical Manufacturers Group (IPMG), an association of foreign pharmaceutical companies in Indonesia, overseas drug companies have invested over US\$ 1 billion in Indonesia's pharmaceutical market in recent years.

Sub-Saharan Africa (SSA)

The region of SSA accounts for 25% of global burden of disease and represents less than 1% of global health expenditures. Patients are financing 50% of SSA's total health expenditures. According to the World Health Survey 2003, the average share of medicines in out-of-pocket health payments in SSA (14 countries) is 37%, while at country level, this share varies from 11% in Chad to 62.2% in Burkina Faso. In 2012, pharmaceutical market in SSA was valued at US\$ 23 billion with a share of 2.3% of US\$ 965 billion global market. In SSA, 37 out of 44 countries have some pharmaceutical production and local manufacturer account for 25-30% of SSA local demand. However, pharmaceutical production is highly concentrated among a few countries. South Africa's pharmaceutical market is one of the most attractive markets in Africa. Some of the main reasons for its rapid growth are the availability of cost-effective and skilled labor, high quality infrastructure, and the introduction of the South African Health Products Regulatory Authority (SAHPRA). Nigeria was the second leading producer with a share of 6% (i.e. US \$ 1.4 billion). Among other OIC countries, Morocco produced US\$ 1.2 billion and Tunisia produced US\$ 0.8 billion worth of medicines in 2012.

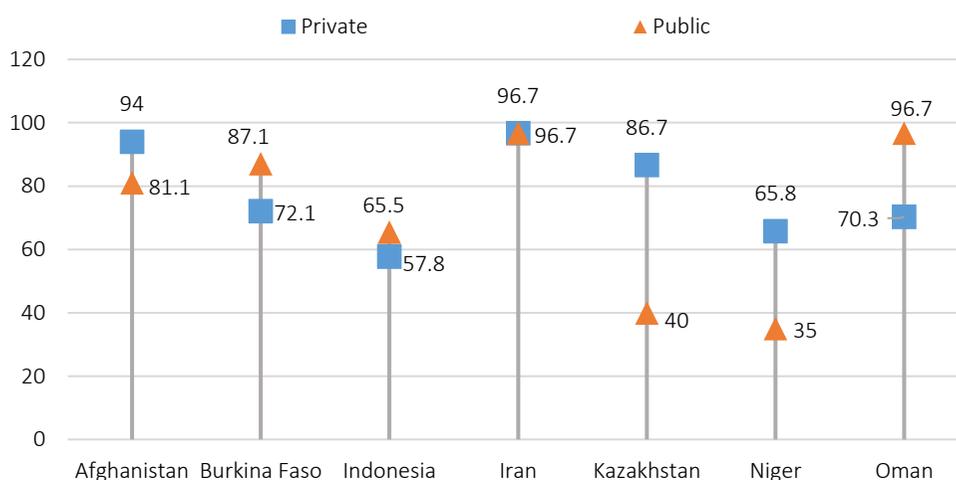


5.1.3 Availability of Essential and Generic Medicines

Target 8.E of the Millennium Development Goals and Sustainable Development Goals (SDG) Target 3.8 acknowledged the need to improve the availability of affordable medicines in developing countries. Several countries have made progress towards increasing access to essential medicines. However, access to essential medicines in developing countries is not adequate. In countries for which the data is available, essential medicines are available in only 57% of public and 65% of private health facilities in 2012. Prices of medicines are about 3.3 to 5.7 times the international reference prices (UN, 2013).

In OIC countries, for which the relevant data are available, the median availability of selected generic medicines for public sector health ranged between 35% and 96.7% (with an overall average of 71.9%) (Figure 5.2). Similarly, for the private health sector, OIC countries represented a heterogeneous structure, with the median availability ranging from 57.8% to 96.7% (with an overall average of 77.6%). Iran has the highest median availability rate of selected generic medicines with 96.7% in the public and private sector. However, availability was low in a number of OIC countries. For example, Niger has the lowest availability rate with 35% in the public sector and Indonesia has the lowest availability rate with 57.8% in the private sector.

Figure 5.2: Median Availability of Generic Medicines (percentage), 2007-2013



Source: World Health Organization Data Repository

Medicines are crucial ingredient for the safe and effective prevention and treatment of illness and diseases. It is, therefore, essential to have an easy and a timely access to them. Medicines must be accessible in acceptable quantities however, as mentioned above; this is not the case in most OIC countries (SESRIC, 2014). The availability of essential medicines in the public sector is limited due to insufficient resources and inefficient distribution and procurement. Therefore, private sector becomes the main provider of the medicine for the patient.

However, they charge more. During the period 2003-2009, and due to higher manufacturers' prices, high mark-ups, taxes and tariffs, the median consumer price ratio of selected generic medicines in private sector was three times more than the price ratio in public sector in the OIC countries (SESRIC, 2014).

Pharmacovigilance is defined as the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problem. In OIC countries, pharmacovigilance is weak in detecting, investigating and reporting adverse events following medication and immunization. Efficient systems for quality assurance and surveillance do not exist in many countries and sale of counterfeit medicines is a major problem. Over 90% of medical products are imported (SESRIC, 2014).

5.1.4 *Pharmaceutical Trade*

This section analyses the OIC countries pharmaceutical exports and imports as well as intra-OIC pharmaceutical trade by using the UN Comtrade Database at the 3-digit level of "medicinal and pharmaceutical products, other than medicament of 542" (SITC group 541).

Global pharmaceutical trade has shown an upward trend during the period 2015-2018. Global pharmaceutical exports were valued at US\$ 231 billion while pharmaceutical imports were valued at US\$ 241 billion in 2018. However, like the production, pharmaceutical trade also remained highly concentrated in developed countries that accounted for about 95% of world exports and absorbed nearly 85% of pharmaceutical imports in 2018. As a group, developed countries are net exporters of pharmaceutical products while developing countries are net importers.

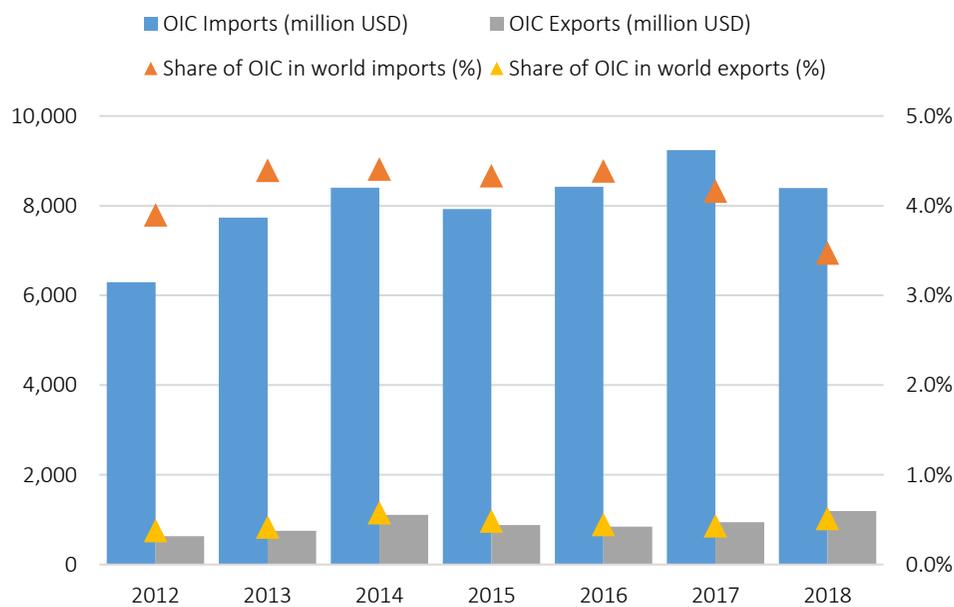
Being a substantial part of the developing countries, majority of the OIC countries is net importer of pharmaceuticals and their share in global pharmaceutical trade remained very low. As shown in Figure 5.3, OIC pharmaceutical exports witnessed an increasing trend during the period 2012-2018. In 2018, OIC pharmaceutical exports valued at US\$ 1,191 billion compared to US\$ 628.7 million in 2010, corresponding to an increase of 89%. In 2018, OIC countries as a group accounted for about 0.4% of world total pharmaceutical exports. In general, OIC Pharmaceutical exports remained highly concentrated in Europe and Central Asia (ECA) and Middle East & North Africa (MENA) which accounted for 41.4% and 29.4% of OIC total exports respectively in 2018.

Provided the weak production capacity and limited technological know-how, majority of member countries are unable to locally produce enough pharmaceuticals needed to meet their domestic needs. As a result, they must import from other countries. OIC pharmaceutical imports have witnessed an upward trend and increased from US\$ 6.3 billion in 2012 to US\$ 9.2 billion in 2017. In 2018, it was measured at to US\$ 8.4 billion in 2018. Compared to the pharmaceutical exports, the share of OIC countries, as a group, remained much higher in the world total pharmaceutical imports. During 2013-2017, the share of member countries in the world pharmaceutical imports was, on average, higher than 4%. In 2018, it accounted for 3.5% of the world total pharmaceutical imports. As in the exports, OIC pharmaceutical imports also



remained highly concentrated in the MENA and ECA regions, which accounted for 41.3% and 31% of the OIC total imports respectively in 2018.

Figure 5.3: OIC Pharmaceutical Trade* (2012-2018)



Source: SESRIC staff calculations based on United Nation's COMTRADE Database

*Calculations are based on Commodity Code 541 (Medicinal and pharmaceutical products, other than medicaments of group 542) under Standard International Trade Classification Revision (Rev.) 4 of the COMTRADE database.

Pharmaceutical exports of OIC countries are highly concentrated in few of them where only 10 OIC countries accounted for more than 95% of the total OIC pharmaceutical exports in 2018 (Table 5.1). Turkey remained the top OIC pharmaceutical exporter with exports of US\$ 484.1 million, which constituted 40.6% of OIC total pharmaceutical exports in 2018. Among the top ten OIC exporters, first five member countries namely Turkey, the United Arab Emirates, Malaysia, Indonesia, and Egypt accounted for 95.7% of OIC total pharmaceutical exports in 2018.

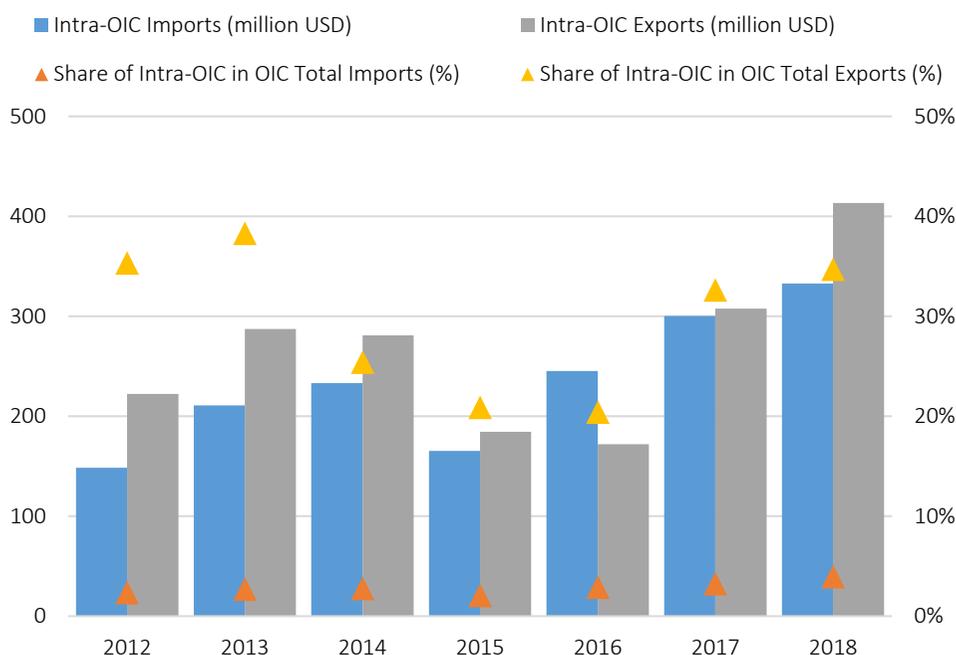
A similar trend can be observed in case of imports as well. In 2018, top ten importers accounted for more than 90% of OIC pharmaceutical imports (Table 5.1). Turkey remained the top pharmaceutical importer with imports of US\$ 2,237 million, which constituted 26.6% of OIC total pharmaceutical imports in 2018. Among the top ten importers, top five importers namely Turkey, Saudi Arabia, the United Arab Emirates, Indonesia, and Pakistan accounted for more than 67% of OIC pharmaceutical imports in 2018.

Table 5.1: OIC Top-10 Pharmaceutical Exporters and Importers, 2018

Rank	Country	Exports (million USD)	Share in Total OIC Exports	Rank	Country	Imports (million USD)	Share in Total OIC Imports
1	Turkey	484.1	40.6%	1	Turkey	2237.1	26.6%
2	UAE	273.0	22.9%	2	Saudi Arabia	1198.1	14.3%
3	Malaysia	213.1	17.9%	3	UAE	851.8	10.1%
4	Indonesia	124.2	10.4%	4	Indonesia	763.1	9.1%
5	Egypt	46.0	3.9%	5	Pakistan	592.2	7.1%
6	Saudi Arabia	26.4	2.2%	6	Egypt	519.4	6.2%
7	Kazakhstan	8.6	0.7%	7	Malaysia	448.6	5.3%
8	Pakistan	5.2	0.4%	8	Kuwait	369.7	4.4%
9	Senegal	3.4	0.3%	9	Lebanon	369.7	4.4%
10	Lebanon	3.1	0.3%	10	Kazakhstan	307.4	3.7%

Source: SESRIC staff calculations based on COMTRADE Online Database



Figure 5.4: Intra-OIC Pharmaceutical Trade* (2012-2018)

Source: SESRIC staff calculations based on United Nation's COMTRADE Database

*Calculations are based on Commodity Code 541 (Medicinal and pharmaceutical products, other than medicaments of group 542) under Standard International Trade Classification Revision (Rev.) 4 of the COMTRADE database.

Intra-OIC Pharmaceutical Trade

At the intra-OIC level, intra-OIC pharmaceutical trade volume almost doubled and increased from US\$ 370 million in 2012 to US\$ 746 million in 2018. As shown in Figure 5.4, intra-OIC pharmaceutical exports have shown an upward trend during the period 2012-2018 that increased from US\$ 94 million to US\$ 109 million. On average, intra-OIC exports accounted less than half of the OIC total pharmaceutical exports in this period. Intra-OIC pharmaceutical exports remained highly concentrated in few member countries.

The share of intra-OIC pharmaceutical imports increased from 2.4% in 2012 to 4% in 2018 in the OIC total pharmaceutical imports. This indicates that many OIC countries increasingly more rely on non-OIC countries to fulfil their domestic pharmaceutical demand (Figure 5.4).

5.2 Vaccines

The global vaccine industry has been dominated by a few multinational companies. However, companies in China, India and other emerging economies have recently become major vaccine manufacturers and have started selling vaccines on the international markets. For

many years, the vaccine sector was characterized by government price controls, a mature product group based on a limited set of technologies. These characteristics constrained the level of investment and the resulting pace of technological innovation. But in recent years, as new vaccines have been introduced to replace older technologies and address new disease areas, the pricing environment has also improved.

5.2.1 Production

Global vaccine market has increased dramatically over the recent decades from US\$ 5 billion in 2000 to US\$ 34 billion in 2017. It is a rapidly growing market with an annual growth rate of 10-15%. It was estimated that the vaccine market accounts for 2-3% of global pharmaceutical market (WHO, 2013). Globally, vaccine sales are highly concentrated in developed countries which accounts for over 80% of total sales in terms of value. Vaccine manufacturing is considered as a very complex business mainly due to poor returns on investment and high risk in R&D. It is partly due to these factors that despite an increase in vaccine demand, the number of vaccines producing countries has declined from 63 in 1990 to 44 in 2010. Today, emerging developing countries are the major vaccine producers. As of 2013, over 70% of global vaccine demand is met by only three countries namely: China, India and Indonesia (WHO, 2013).

Vaccines production capacity remained very low across OIC countries. According to the latest estimates, only two OIC countries namely: Indonesia and Iran have good manufacturing capacities whereas other vaccine producers like Senegal, Uzbekistan, Bangladesh, Tunisia and Egypt are characterized by low production capacities. Indonesia remained the star performer with 10% share of the global vaccine production and is the third largest vaccine producer after China and India.



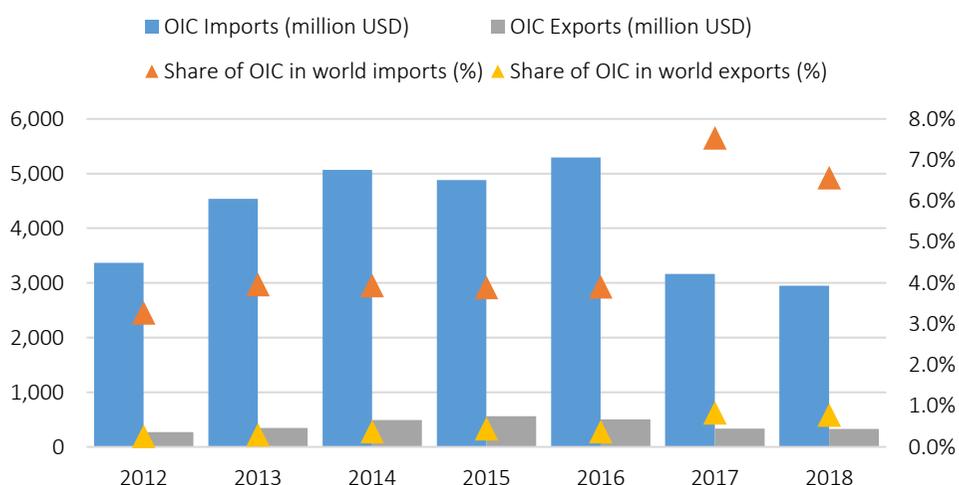
5.2.2 Trade

As vaccine production is very limited in OIC countries, they rely heavily on vaccine imports. The UN Comtrade Database at the 4-digit level of "glycosides; glands or other organs and their extracts; antisera, vaccines and similar products" (SITC group 5416) has been used in order to analyse OIC vaccine trade. Between 2012 and 2018, OIC exports of vaccines have shown an upward trend from US\$ 268 million in 2012 to US\$ 331 million in 2018 with a share of 0.8% in the world total. Similarly, OIC imports of vaccines increased from US\$ 3.37 billion in 2012 to US\$ 5.3 billion in 2016. However, it regressed during the period 2017-2018. It was measured at US\$ 2.95 billion in 2018 and represented a share of 6.6% in the world (Figure 5.5).

OIC countries display a heterogeneous structure in terms of vaccine procurement. Low income OIC countries are largely procuring vaccines through Global Alliance for Vaccines and Immunizations (GAVI), while high income countries such as Gulf countries self-procure new vaccines. On the contrary, middle income countries have been experiencing financial and operational difficulties with the introduction of new vaccines. Among other factors, lack of sufficient funds and the prevailing high prices of the new vaccines constitute two main obstacles. In addition to delivering vaccinations, national immunization programs are concerned with the quality and safety of immunization through the adoption of safe injection technologies (auto disabled syringes, storage boxes, and incinerators) and proper cold chain and vaccine stock maintenance.

OIC countries are classified in two groups according to the source of the vaccines that are used in their Expanded Programme on Immunization (EPI). First group consists of 31 OIC

Figure 5.5: OIC Vaccine Trade* (2012-2018)



Source: SESRIC staff calculations based on United Nation's COMTRADE Database

*Calculations are based on Commodity Code 5416 (Glycosides; glands or other organs and their extracts; antisera, vaccines and similar products) under Standard International Trade Classification Revision (Rev.) 4 of the COMTRADE database.

countries sourcing their vaccines through UNICEF and Global Alliance for Vaccines and Immunizations (GAVI) such as Afghanistan, Bangladesh, Benin, Burkina Faso, Cameroon, Chad, and Comoros. Second group refers to the OIC countries procuring the vaccines directly from manufacturers such as Bahrain, Kuwait, Iran, Iraq, Jordan, Libya, Oman, Palestine and Qatar.

5.3 Medical Technologies

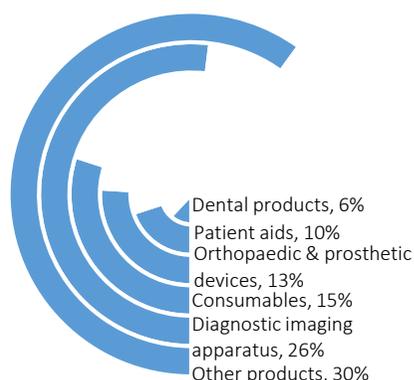
Health technologies, especially those dealing with medical devices, are crucial for the services offered in prevention, diagnosis, and treatment of illness, disease, and disability. Several definitions exist for the term health technologies. According to the Global Initiative on Health Technologies, health technologies refer to the application of organized knowledge and skills in the form of devices, procedures, and systems developed to solve a health problem and improve quality of lives.

This section attempts to present the status of development of health technology program dedicated to medical devices in global market and OIC countries by using the baseline country survey on medical devices conducted by WHO between 2010 and 2013.

5.3.1 Medical Device Market

Medical devices refer to an article, instrument, apparatus or machine that is used in the prevention, diagnosis or treatment of illness or disease, or for detecting, measuring, restoring, correcting or modifying the structure or function of the body for some health purpose. There are approximately 10,000 types of generic medical device groups available through global markets. As shown in Figure 5.6, diagnostic imaging equipment accounts for the largest proportion (26%) of the global market, other electro-medical equipment such as monitors, defibrillators, sterilizers comprise around 30% followed by consumables (15%) and orthopaedic as well as prosthetic devices (13%). In 2014, the global medical devices market was estimated to be worth US\$ 361 billion. With 3% average growth, the global medical devices market will reach US\$ 427 billion in 2018. The "Rest of World" market (all areas outside of the U.S., Europe, and Asia) represents a fifth of the world device market.

Figure 5.6: Global Medical Devices Market



Source: WHO, Global Atlas of Medical Devices, 2013-2014

5.3.2 Health Technology Policies

Having a national health technology (medical device) policy can help in guaranteeing the best use of resources according to the needs of the population. In 2013/2014, 23 out of 48 OIC



countries (48%) have a health technology national policy. On the other hand, 25 out of 48 OIC countries (52%) do not have any. Such a ratio is highly comparable to the developed countries average of 38% and equal to the world average of 52%. Algeria, Benin, Jordan, Morocco, Oman, Qatar and Saudi Arabia have a national technology policy, but it is not part of the national health program/plan or policy.

Units in the Ministry of Health can perform health technology assessment, planning, acquisition, utilization or other type of medical devices management related tasks. In the period of 2013-2014, 40 out of 48 OIC countries (83%) had a unit within the Ministry of Health. This situation indicates that although many OIC countries have units responsible for the management of medical devices, they do not have national medical device policy, which implies that these units in the Ministry of Health are not efficient (SESRIC, 2014a). In other words, national health planners in many OIC countries should recognize concepts such as health technology assessment and management. Moreover, 8 out of 48 OIC countries such as Bangladesh, Burkina Faso, Chad and Comoros did not have any unit (Table 5.1).

Table 5.1: National Health Technology Policy and Unit, 2013-2014

	Yes	No
Does your country have a dedicated National Policy for Health Technology?	23	25
Does your country have a dedicated Health Technology Unit within the Ministry of Health?	40	8

Source: WHO, Data Repository

Lists of Approved Medical Devices

Availability of national list of approved medical devices for procurement or reimbursement is one of the indicators listed in WHO Strategic objective 11 which calls for improved access to safe and effective health care products and technologies. In the period of 2013-2014, 28 out of 47 OIC countries with the available data did not have any national list of approved medical devices of procurement or reimbursement in the country. Jordan, Kyrgyzstan, Mali, Sierra Leone, Tajikistan, Turkey and Uganda had a national list of approved medical devices for procurement or reimbursement in the country. On the other hand, in this period, 12 out of 47 OIC countries had a national list but it was only a recommendation (Figure 5.7).

Official Nomenclature for Medical Devices

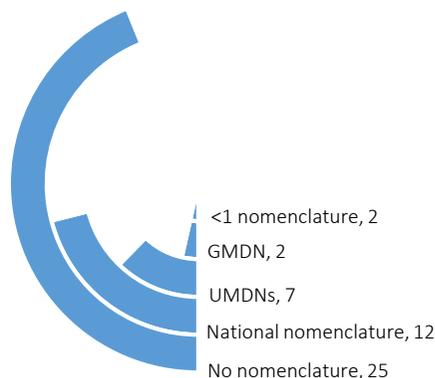
Type of nomenclature system for medical devices within the country refers to many nomenclature systems on medical devices that facilitate better classification, regulation and management. The survey data conducted by WHO provides information on the use of these systems and helps determine the need for a nomenclature. In the period of 2013-2014, 25 out of 48 OIC countries did not use any type of nomenclature. However, 12 out of 48 OIC countries such as Albania, Egypt, Kazakhstan, Turkey, Tunisia and Uganda used a nationally developed nomenclature system. Gambia and Indonesia based their nomenclature system on more than one system (Figure 5.8).

Figure 5.7: OIC Countries with a List of Medical Devices, 2013-2014



Source: WHO, Data Repository

Figure 5.8: OIC Countries with a Nomenclature for Medical Devices, 2013-2014



Source: WHO, Data Repository

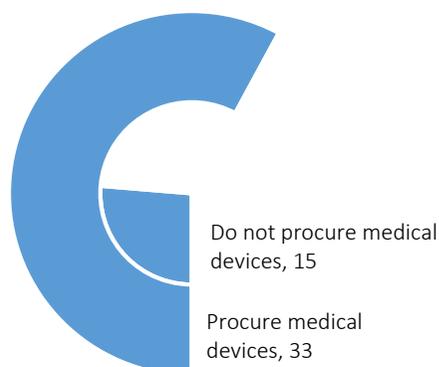
Jordan, Kyrgyzstan, Morocco, Qatar, Sierra Leone, Somalia and Sudan used a nomenclature system based on the Universal Medical Device Nomenclature System (UMDNS). Moreover, Tajikistan and Malaysia used a nomenclature system based on the Global Medical Device Nomenclature (GMDN). On the other hand, only 7 out of 48 OIC countries, namely Albania, Libya, Saudi Arabia, Senegal, Sierra Leone, Sudan and Tajikistan used nomenclature as regulatory, procurement or inventory purposes.

Procurement of Medical Devices

Procurement of medical devices carried out at the national level is the way in which countries procure medical devices either national level or not. It allows countries to develop specific data on procurement. Over-supply of the procured products leads to escalation of delivery costs and inequitable access among the population (WHO/EMRO, 2012). Fifteen, out of 48 OIC countries with data, did not have procurement of medical devices carried out at the national level (Figure 5.9).

Moreover, national guidance is indispensable for resource distribution in a domestic context. National guidelines, policies or recommendations on the procurement of medical devices are important for optimal allocation of medical device resources and the process of medical device

Figure 5.9: OIC Countries that Procure Medical Devices, 2013-2014



Source: WHO, Data Repository

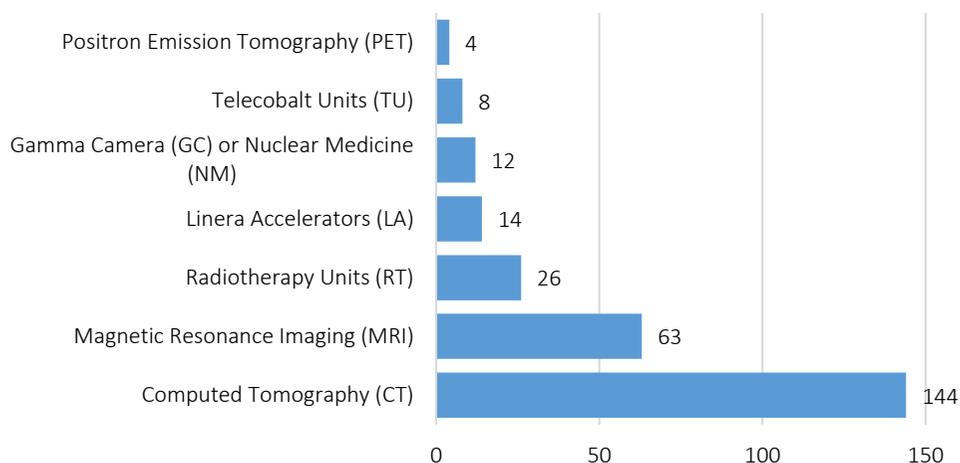


procurement. Twenty-two, out of 48 OIC countries with data, did not have any guidelines for the procurement of medical devices.

Availability of Medical Devices

In general, high technology, specialized equipment is less available in OIC countries. In the period of 2013-2014, Computed Tomography (CT) scan units from the public and private sectors represented the highest density of medical devices among OIC countries with 144 CT per million populations (Figure 5.10). The density of CT scan units is followed by Magnetic Resonance Imaging (MRI), Radiotherapy units (RT), Linear Accelerator (LA), Gamma Camera or Nuclear Medicine (GC or NM), Telecobalt Unit (TU), Positron Emission Tomography (PET) with the interval between 4 and 63 units per million populations in OIC countries (Figure 5.10).

Figure 5.10: Density of Medical Devices in OIC Countries (per million people), 2013-2014



Source: WHO, Data Repository

CHAPTER 6

Emergency Risk Management for Health

The range of emergencies faced by countries worldwide is highly diverse and wide-ranging, and includes various types of natural hazards, conflict, mass displacement, climate change, poverty and amongst others public health concerns. It is important to note the particularity of health with reference to emergencies. Nearly, if not all, emergencies effect the health of individuals. The global public health concerns that arise from emergencies include infectious disease outbreak, chemical and radiation contamination, disabilities, psychological problems and other health impacts. During such emergencies, people are often cut from basic and essential care, life-saving medicines, proper infrastructure and medical supplies.

Today, one in four children is affected by conflict or disaster (UNICEF, Health in Emergencies, 2018). In 2017, over 300 natural disasters affected more than 95.6 million people, killing an additional 9,697 and costing a total of US \$335 billion (Relief web, 2018). It is estimated that nearly two billion people live in countries where development outcomes are affected by fragility, conflict, and violence (WB, 2017). Globally, 65.6 million people are forcibly displaced. Climate change is having environmental repercussions that are inescapably causing detrimental impacts worldwide.

Health is at the centre of the above-mentioned emergencies. Consequently, it is vital to have proper emergency risk management mechanisms to be able effectively decrease the negative health impacts. The traditional approach to health in emergencies has been concentrated on effectively responding to it. However, there is recently a move towards greater emphasis on prevention and mitigation. Some countries have been more successful in taking preventative measures such as building resilient health systems based on protection of facilities and services and increasing capacities to deliver timely and effective response and recovery. However, most countries around the world still react to emergencies through the traditional mechanism of responding.



In an attempt to battle the health concerns in emergencies on the global scale, the World Health Organisation (WHO) has directly mentioned the protection of people from health emergencies as a target in its 5-year strategic plan (WHO, Ten Threats to Global Health in 2019) – the 13th General Programme of Work. The plan in the document is focussed on the triple billion target: ensuring 1 billion more people benefit from access to universal health coverage, 1 billion more people are protected from health emergencies and 1 billion more people enjoy better health and well-being (WHO, 2019). Within these global developments of emergencies and the need for the health sector to prepare, prevent, mitigate and respond to such situations, it is critical that we assess the situation in OIC Member States.

Most of the OIC Member States are faced with a wide range of emergencies resulting from natural disasters, armed conflict and poverty amongst others. Often these emergencies have implications on OIC countries' political, social, economic and public health structures. Whether they are due to natural disasters, conflicts, disease outbreaks or any other hazards, emergency crisis can have severe impacts on health systems. The most critical challenge facing OIC Member States is strengthening their health systems to be more resilient and effective in dealing with emergencies.

The OIC Member States are diverse in many aspects including socio-economic status, development level, infrastructure and health. The emergencies they face also show heterogeneity. While some OIC countries are faced with natural disasters, others are engulfed in emergencies due to conflict and violence. OIC countries account for 61.5% of all displaced people in the world with more than 25 million displaced people (SESRIC, 2017). Syria became the centre of the one of the most serious humanitarian crises of the modern times. Moreover, natural disasters during the last four decades have witnessed a sharper upward trend inside OIC countries, significantly increasing from around 681 recorded incidents in the 1990s to 1,747 in the 2000-2016 period with a rate of increase higher than that of the world average (SESRIC, 2017). Along with major socio-economic costs from these conflicts and disasters, people across the OIC countries are facing major health limitations and shortages in emergencies.

Even though each emergency is different, its health sector vulnerabilities share many similarities. By integrating common disaster management methods and policies regarding the health system, resilience of communities and the health system can be fortified. It remains a challenge for OIC Member States to move away from response and recovery to prevention and mitigation in their health systems. It is important to mention that some OIC countries have made progress in managing disaster risks and their health responses. Yet, the health capacities of OIC countries show extreme diversity. The ongoing conflicts, lack of funding in health systems, limited access to resources and technology amongst others are the major factors affecting OIC countries ability to develop their capacities.

In light of the above discussion, this section focusses on the emergency health needs and capacities of OIC Member States. It reiterates the salience of and need for strengthening health systems for emergency management. The chapter assesses the current situation in OIC

countries; however, due to the limited nature of data regarding information on health response a comprehensive assessment could not be delivered. Nonetheless, it provides a much-needed overview for OIC countries. Since conflicts are a major source of health concerns and they are more visible in OIC countries, the final section of the chapter ends with an analysis of the health situation in conflict affected OIC Member States.

6.1 Need for Strengthening Health System Capacity

Emergencies of various types, scales and complexity occur in many parts of world despite the wide range of measures taken to prevent them. When emergencies do occur, countries and communities need to be prepared for the potential human, economic, societal and health consequences. The greatest vulnerability in any country during and proceeding an emergency is the health and wellbeing of its people. Whether from natural hazards or manmade conflicts, the continuity and sustainability of the health system faces serious risks during times of crises. Emergencies have the potential to destroy years of health sector development due to the damage it causes to health infrastructure, supplies, workers and ultimately health systems as a whole.

During times of emergencies, delivering effective health services become even more important to minimize the toll on people. Preparing for emergencies requires that health system capacity of countries, regional and international actors be increased and made ready to respond in a timely and operative manner. Therefore, it is of vital importance to take specific measures to strengthen health system capacity for emergency management. Strengthening health system capacity for emergency management includes the ability to be prepared before the crisis to be able to respond effectively when it arises, maintain core functions when a crisis hits, protect health infrastructures and have the ability to reorganize if the situation requires it (Kruk et al. 2015). There are several different elements to strengthening successfully health system capacities, which range from policy, formulation, research and training to meeting the funding, infrastructure and supply demands. Before proceeding to discuss further the elements just mentioned, it is important to highlight that strengthening health system capacity for emergencies requires that health systems as a whole pre and post crises be strengthened and functioning properly.

The first important element in strengthening health system capacity is funding. On a global scale, health institutions in low-income countries are commonly underfunded and focused on short-term interventions that lack the sustainability required for strengthening health systems. Institutions in low-income countries such as ministries of health, universities, and health policy organisations are habitually underfunded, and funding is often irregular and exclusively for short-term issues and projects (Swanson et al., 2019). Macro-level global policies such as aid, intellectual property issues and pharmaceutical pricing also all have an impact on health systems capacity. Barriers caused by funding hinder countries ability to build resilient, effective and operational health systems. Therefore, funding is a vital component of strengthening health system capacities to not only function properly during “normal” times but also to function effectively during emergencies.



The funding for health systems is a major concern for OIC Member States. As discussed comprehensively in the previous sections, OIC health expenditures per capita, as percent of GDP and share of government spending are all below the world and non-OIC developing country groups averages (See Chapter 2). Without the necessary funding, it is very difficult to increase the capacity of the health system to play an active role in emergency management. Numerous OIC countries face a diverse range of natural and manmade hazards, which calls for funding and resources to wide range of issues ranging from natural disasters and disease outbreak to mass displacement and conflict. Most commonly, these countries face more than one hazardous situation. Table 6.1 displays the multiple hazards faced by different OIC countries. All these issues call for targeted funding to decrease and eliminate the health problems arising out of these hazardous situations. It is through a holistic and a comprehensive funding systematic that the OIC Member States can increase their health system capacities to deal with the multiple hazards facing them.

Table 6.1: Hazards in OIC Member States, 2016-2018			
Country	Hazards	Country	Hazards
Afghanistan	Natural disasters, disease outbreak, armed conflict, displaced population	Oman	Disease outbreak, natural disasters, hosting displaced population, labor migration
Bahrain	Disease outbreak, labor migration	Pakistan	Natural disasters, disease outbreak, displaced population, mass gatherings
Djibouti	Disease outbreak	Palestine	Armed conflict, disease outbreaks
Egypt	Disease outbreak, hosting displaced population	Qatar	Disease outbreak, labor migration, mass gatherings
Jordan	Disease outbreak, hosting displaced population	Saudi Arabia	Natural disasters, disease outbreak, labor migration, mass gatherings
Iran	Natural disasters, disease outbreak	Somalia	Natural disaster, armed conflict, disease outbreaks
Iraq	Natural disaster, armed conflict, disease outbreak, mass gatherings	Sudan	Natural disaster, armed conflict, disease outbreaks
Kuwait	Disease outbreak, labor migration	Syria	Armed conflict, disease outbreaks, displaced population
Lebanon	Lebanon	Tunisia	Natural disasters, disease outbreak, mass gatherings
Libya	Disease outbreak, armed conflict	UAE	Disease outbreak, labor migration, mass gatherings
Morocco	Disease outbreak, labor migration	Yemen	Armed conflict, disease outbreaks

Source: Compiled from WHO, 7th World Health Summit, 2019

Another important facet of strengthening health systems to become more prepared to respond to emergencies is capacity building for health research. Health research supports the identification of problems and solutions during emergencies, and it is a foundational building block of health system capacities. With the right health research, health concerns during crisis can be better managed, and its burden minimized on the lives of individuals. Not only is health research important during emergencies to effectively respond to it but it is also essential before a crisis breaks out. Health research before crisis can help mitigate the problem by detecting the scale of the emergency before it happens, the required supplies and needs, the sorts of health hazards the crisis may cause and the manner in which a response should take place.

Despite increasing levels of investment in health research capacity strengthening, health research is disproportionately located in the global North (Bowsher et al., 2019). For example, the *Lancet Global Health* established that only 35% of authors are from the Low and Middle - Income Countries (LMIC) while the rest of them are from developed countries. As such, Bowsher et al. (2019) argue that current capacity for conducting health research in many LMIC remains limited and undermines the transformation of health systems into sustainable entities that are able address emergencies effectively.

An additional aspect of health research, particularly important for OIC countries, is research emerging from countries in conflict. Research from conflict-affected countries is even less common despite the dire health needs of conflict-affected populations (Bowsher et al., 2019). Research and publications tend to be lower in the OIC region when compared to other country groups (SESRIC, 2019). Within this context, health research in OIC countries including ones with conflict are extremely limited if any. Therefore, OIC countries need to provide greater energy to increasing health research as part of their framework to strengthen the health system capacity to counter appropriately the many emergencies and crisis they are facing, or they may face in the future.

Complementary to funding and research is the necessity to create health policies that support effective health systems for emergency management. At the national level, health policies, social norms and the private sector influences strongly the capacity of health systems. Policies such as funding, regulation, infrastructure investments and technological utilization enable or impede health sectors capacity to deliver health interventions effectively especially during emergencies (Swanson, 2019). Within the framework of health policy are also issues of social norms such as not treating health as a priority at the individual, family, community and government levels. When health becomes secondary to other issues, preparing, mitigating and responding to emergencies in terms of health becomes limited. Therefore, policies should aim to strengthen health systems by putting in place internationally recognized regulations, providing funding, incentivizing research and eliminating negative social norms. In the OIC Member States, health policies show great variance, strength and weaknesses. Although some OIC countries have fared better in their policies to increase their health system



capacities, many are lacking a comprehensive method to develop their health systems. In turn, this causes an inability to prepare, mitigate or respond to emergencies suitably.

A usually underemphasized element of health system capacity is technological utilization. Strengthening health system capacities encompasses activities that enhance any or all of the core service functions such as human resources for health; health finance; health governance; health information; medical products, vaccines and technologies; and service delivery. In this context, it is important to highlight that health technologies and informatics are inherently an important component of health systems. National Library of Medicine of the United States of America defines health informatics as the interdisciplinary study of the design, development, adoption and application of innovations based on information technology (IT) in health-care services delivery, management and planning (Siribaddana, 2019). Information technology is less common in the LMIC compared to developed countries.

Amongst the OIC countries, some have been able to make progress in adopting technological tools to enhance health systems capacities while many have not been able to utilize such systems. These sorts of technologies become even more important during times of crisis. With the rightly adopted technologies and trained personnel to use them, health concerns in emergencies can be significantly reduced (Siribaddana, 2019). OIC Member States need to pay more attention to the adoption of health technologies to assist them in their dealing with various types of emergencies. Table 6.2 displays some of the conventional methods versus new technological methods in emergency medical services response to emergencies. While many OIC countries still tend to use conventional method in emergencies, developed countries are widely employing the application of technological methods in their health systems and are moving towards new and innovative use of informatics to enhance their health system capacities to response to emergencies.

Table 6.2: Conventional Methods and Technological Methods in Health Systems

Area	Conventional Methods	Technological Methods
Communication	Landlines	Satellite
Geolocation	Radio communication/paper maps	Global positioning system, radio frequency identification and cellular triangulation.
Patient Tracking	Paper Tags	Bar Code Tracking
Patient Data and Monitoring	Paper Tags	Electronic Monitoring System
Incident Command and Management	Radio Communications/White Board	Electronic Dashboards

Source: Chan et al., 2004



Finally, an extremely important aspect of health systems capacity is human resources. Human capacities are critical in strengthening the resilience of health system and ensuring continuity in the delivery of effective, quality services to all people in all settings. When health systems and health workers are well prepared for emergencies, and to anticipate the health needs of the population, they can respond more promptly and effectively in the event of a crisis. In the 2014-2015 Ebola epidemic in West Africa for example, many health workers died, and already fragile health systems were further weakened, which resulted in increased maternal, infant and child deaths (EWEC, 2015). Human resources in the health sector of the OIC region is still limited and the desired competency has not been reached (see Chapter 2 for details). Therefore, health system emergency preparedness requires the right quantity and quality of health workers to be able to respond effectively and timely to crisis.

Box 6.1: Health IT Utilized in Emergency Medical Services

Everyday emergency medical service (EMS) providers enter data into an electronic patient care record (ePCR), the EMS equivalent to an electronic health record (EHR). The data collected includes individual patient information as well as operational, service delivery and quality data. In most cases, local EMS providers share an aggregated de-identified minimum NEMSIS data set with their state EMS agency who then shares a subset of this data at the national level, which is collected and stored in a national NEMSIS database. Ultimately, the National EMS Information System (NEMSIS) uniform dataset and national database can help local, state and national EMS partners address issues such as EMS performance and clinical interventions, strategic planning, and future requirements.

Source: Emergency Medical Services and Emergency Preparedness. Retrieved from healthit.gov, 2019

The above-mentioned five elements (funding, research, policy, technology and human resources) play a salient role in increasing the capacity of health systems to respond to emergencies in a timely, effective and holistic fashion. In this context, the International Health Regulations (IHR) adopted by the WHO Member States in 2005 require that all countries have the ability to detect, assess, report and respond to potential public health emergencies of international concern at all levels of government, and to report such events rapidly to the WHO to determine whether a coordinated, global response is required. Epidemics in the past decade in Africa, including some OIC countries, have pointed to the importance of implementing the IHR, and to strengthening the health system and its interaction from local to national level to produce effective responses.

A common, efficient, coordinated multi-sectoral approach, comprising all-hazard and hazard-specific measures, is needed to ensure preparedness for all types of emergencies, including local and national outbreaks of infectious diseases; epidemics and pandemics; and other types of emergencies caused by natural, technological and societal hazards that can have a



significant impact on health outcomes. Table 6.3 provides the descriptions of different types of health-related emergencies. In order to ensure a timely, efficient and effective response to such events, it is important to strengthen country and community emergency preparedness.

Recently, WHO prepared a Strategic Framework for Emergency Preparedness (SFEP), which identifies principles and elements of an effective health emergency preparedness scheme for a country. It advocates for prioritizing financial and other resources for emergency preparedness at the community and country levels, and for mobilizing and sustaining increased domestic and international investment (WHO, 2017a). Therefore, it can be useful in prioritizing and implementing important emergency preparedness actions while strengthening inter- sectoral collaboration with other government divisions, the private sector and civil society.

Table 6.3: Types of Emergencies

Major Groups	Groups	Sub-Groups	Examples	Features & Actions
Emergencies due to natural hazards	Biological hazards	<i>Local and national outbreaks</i>	Ebola, meningitis and many other communicable diseases	Their management depends largely on the ability of national and local health systems to detect them and to respond rapidly and competently.
		<i>Outbreaks due to pathogens with pandemic potential</i>	MERS CoV and avian A(H5N1) influenza	These are potentially highly transmissible pathogens among humans and which have been detected in numerous countries, but which have not yet reached pandemic status. Fundamentally, different actions may be needed.
		<i>Pandemics</i>	A(H1N1) influenza	Typically requires a substantive response. There is a need to reduce transmission and manage the response with limited access to vaccinations, drugs and other forms of assistance.

	Hydro-meteorological and geophysical hazards	-	Floods, drought and earthquakes	Natural disasters result in direct and indirect effects on health and disruption of societal and health systems (and the further possibility of outbreaks), require multi-sectoral and health sector preparedness.
Emergencies due to human-induced hazards	Technological hazards	-	Industrial pollution, nuclear radiation, toxic waste, fires and chemical spills	These may cause localised effects or result in widespread regional or global phenomena.
	Societal hazards	-	Armed conflicts, terrorism, deliberate use of chemical, biological, radiological and nuclear agents	Armed conflicts can cause great morbidity and loss of life and disruption to basic services including health that can last for many years, even decades. Substantial international assistance is usually needed.
<i>Source:</i> Compiled from WHO (2017a)				

The SFEP identifies twelve core components that represent distinct areas of work. These include components associated with the strengthening of the areas outline in Table 6.4. These areas highlighted by WHO indicates the importance of increasing health systems capacity as a whole. In OIC countries where many of these areas are either lacking or limited, it becomes extremely relevant for them. By improving and investing into strengthening the areas mentioned in Table 6.4, OIC countries will be better equipped to prepare, mitigate and respond to various kinds of emergencies as outline in the above table.

At the same time, emergency preparedness is a shared responsibility that requires coordination between communities and national and international actors. It also necessitates effective partnerships between public and private actors, civil society, donors and technical agencies. Therefore, ensuring health security relies on coordinated multi-sectoral action and investment to build consolidated emergency preparedness. When prepared, responses are timelier and more effective, and the human, economic and societal consequences of



emergencies can be significantly limited. Achieving emergency preparedness has a cost, but this is an investment in health, safety, security and development. Health emergencies caused by natural disasters, conflicts and the cross-border spread of infectious diseases have increased recognition of the profound effects of emergencies on development.

Table 6.4: Twelve Core Components of SFEP

Area	Component
<i>Governance</i>	<ol style="list-style-type: none"> 1. National policies and legislation that integrate emergency preparedness 2. Plans for emergency preparedness, response and recovery 3. Coordination mechanisms
<i>Capacities</i>	<ol style="list-style-type: none"> 1. Assessments of risks and capacities to determine priorities for emergency preparedness 2. Surveillance and early warning, information management 3. Access to diagnostic services during emergencies 4. Basic and safe health and emergency services 5. Risk communications 6. Research development and evaluations to inform and accelerate emergency preparedness
<i>Resources</i>	<ol style="list-style-type: none"> 1. Financial resources for emergency preparedness and contingency funding for response 2. Logistics mechanisms and essential supplies for health 3. Dedicated, trained and equipped human resources for emergencies

Source: WHO, 2017

Emergency and disaster risk management for health (EDRMH) requires a systematic assessment of the risks to public health posed by hazards; prevention and mitigation of those risks; preparation for emergencies with comprehensive, multi-sectoral plans with appropriate legislation and supportive policy, and capacity building; quick and effective response in the event of a disaster and; planning for post-disaster recovery (WHO, 2017b). If an effective EDRMH is in place, many of the deaths, injuries, diseases, disabilities, psychosocial problems and other health impacts could be avoided or reduced significantly. However, every new threat reveals the persisting challenges in managing health risks in times of emergencies and disasters. Many countries could reduce vulnerability and protect health facilities by strengthening resilience of health systems at the community level. It is through building resilient health systems in combination with increasing health capacities that emergencies can effectively be countered, and their health risks significantly reduced. Therefore, resilience is an important component of health systems and should be considered carefully.

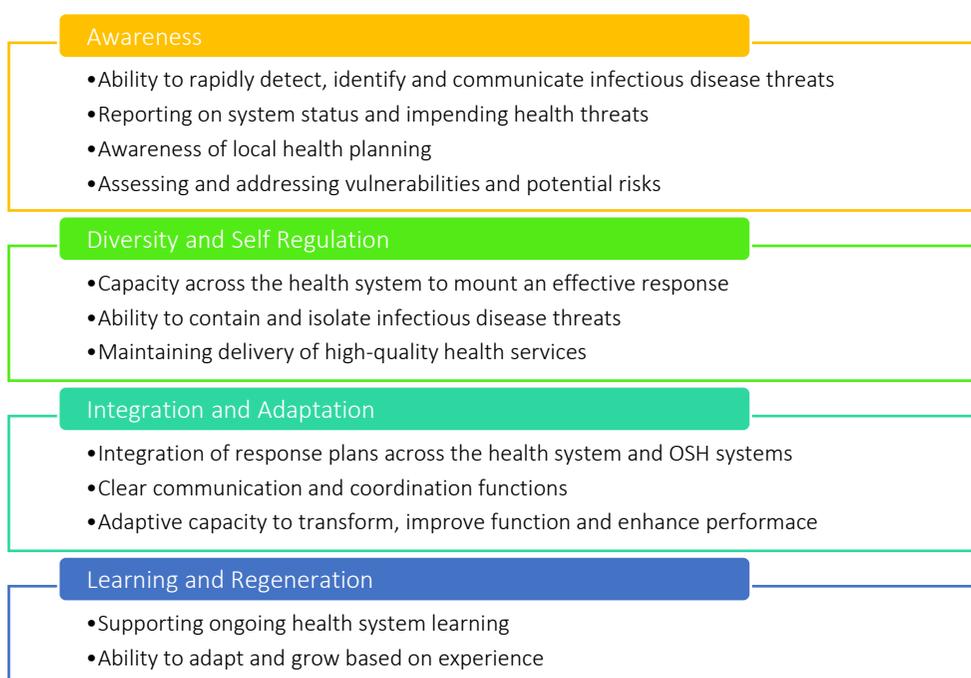
Health system resilience can be defined as the capacity of health actors, institutions, and populations to prepare for and effectively respond to crises; maintain core functions when a



crisis hits; and, informed by lessons learned during the crisis, reorganise if conditions require it. Health systems are resilient if they protect human life and produce good health outcomes for all during a crisis and in its aftermath (Kruk et al., 2015).

There are four characteristics of a resilient health system (Figure 6.1). First, one is awareness. Resilient health systems should be able to rapidly detect, identify and communicate infectious disease threats. It should also be able to assess and address vulnerabilities and potential risks. Second is diversity and self-regulation. They should have the capacity to contain and isolate a broad range of infectious disease threats. They are also self-regulating, with the ability to contain and isolate health threats while delivering core health services and avoiding propagating instability throughout the system.

Figure 6.1: Characteristics of Health System Resilience



Source: Compiled from Kruk et al. (2015) and Ontario (2016)

Third, they need to be integrated and adaptive. Resilient health systems bring together diverse actors, ideas, and groups to formulate solutions and initiate action. Resilient health systems are also adaptive. Accordingly, they are able to transform in ways that improve function in the face of highly adverse conditions. Finally, there is always room for improvement. It is vitally important that the health system continue to learn, adapt and evolve in order to be highly proactive, responsive and well-functioning.



In order to develop adaptable and resilient healthcare systems, flexibility and stability of services are critical. The systems should be ready to cope with large number of patients and deliver different functions at a time. There must be plans for the continuity of health services with priority services identified and response coordination mechanism well designed. Moreover, multi-sectoral action plan should be prepared to protect affected people in wider determinants of health such as water, sanitation, nutrition and security. To ensure the continuity of health services, essential infrastructure such as communications, logistics, energy and water supplies also need to be protected through multi-sectoral coordination.

In countries affected by crises, limited basic health services and infrastructure massively intensifies the challenges of disaster response. Countries with well-developed health systems are often much more resilient and better prepared for disasters. Primary health care builds community resilience and provides the foundation for responding to emergencies. Community-based actions are also critical in protecting health in emergencies, because they prevent risks at the source by using the local knowledge of local risks and avoiding exposure to local hazards. Therefore, a well-prepared and organized community can reduce the risks and impacts of emergencies and save many lives (WHO, 2013).

During crises, resilient health systems will reduce loss of life and mitigate adverse health consequences by providing effective care for emergency and routine health needs. Resilient health systems can also minimise social and economic disruption that characterise outbreaks and other large-scale health threats. A major concern after crises is disease outbreak. In general, poverty, urbanization and population displacement have led to concentration of human populations in conditions that favour major outbreaks. The challenge is to strengthen global efforts to detect and contain epidemic disease threats. In order to prevent such outbreaks, a comprehensive alert and response system should be developed with various components including such as surveillance, response and assessment after the event.

6.2 Assessment of Health System Capacities for Emergency Management

Assessment of existing health system capacities is critical for emergency preparedness. The lack of data on available health resources often creates a major gap in decision making during emergencies. Nickerson et al. (2015) suggests that the assessment of the availability and functionality of health services and facilities is technically feasible in emergencies, even under difficult circumstances. In this regard, Health Resources Availability Mapping System of WHO helps to promote and support good practice in mapping health resources and services availability in emergencies to strengthen informed based decision making by the Health Cluster. It aims to ensure that assessment and monitoring of health resources and services availability can be conducted systematically and quickly despite limited time, resources and accessibility.

In this respect, several assessment tools and mechanisms are developed to evaluate the preparedness of health systems for emergencies. There are also various response mechanisms in different countries, where national Red Cross and Red Crescent societies take great responsibilities. This subsection discusses some elements of the emergency health system capacities.

6.2.1 *The Emergency Health System Framework*

The emergency health system framework, developed by WHO as the conceptual basis used for describing and analysing health systems during emergencies, is composed of six building blocks, 1) leadership and governance, 2) health workforce, 3) medical products, vaccines and technology, 4), health information 5) health financing, and 6) service delivery. The WHO Regional Office for Europe has adopted health system strengthening as the approach to support emergency preparedness and enhancement of crisis management capacities, and developed a practical, action oriented Toolkit based on these six functions, which is further subcategorized into 16 key components and 51 essential attributes to facilitate a structured and reproducible assessment of the preparedness of health systems.

The final version of the toolkit was published early 2012 based on pilot assessments carried out in around 20 countries including Azerbaijan, Kazakhstan and Turkey. These reports used a standardized assessment method with an all-hazard, multi-sector approach, adopting the WHO health systems' framework as the conceptual basis for describing and analysing the status of health systems preparedness for crises and identifying key recommendations (WHO, 2012). Brief outcomes of these reports were presented in the 2015 edition of the OIC Health Report.

Since assessments on emergency health services are available for only few OIC countries, it would be beneficial for other OIC countries to conduct an evaluation study on their existing capacities and needs, possibly in cooperation with WHO or other professional organizations. Overall, the implementation of any national integrated emergency preparedness programme requires sufficient and well-equipped staff to develop standardized health-sector emergency preparedness plans and to formulate policies on education, training, accreditation and research.

Ministries of health should have some form of institutional arrangement to ensure the development and maintenance of health emergency preparedness and response programmes. An effective emergency response system should include a professional health institution, well-trained health technical personnel, smooth and accurate disease surveillance and report system, modern laboratory, electronic information system that can facilitate quick communication with other departments, adequate supplies of medicine and vaccines, and effective methods to prevent the spread of disease, all of which are essential to emergency control (APEC, 2012).

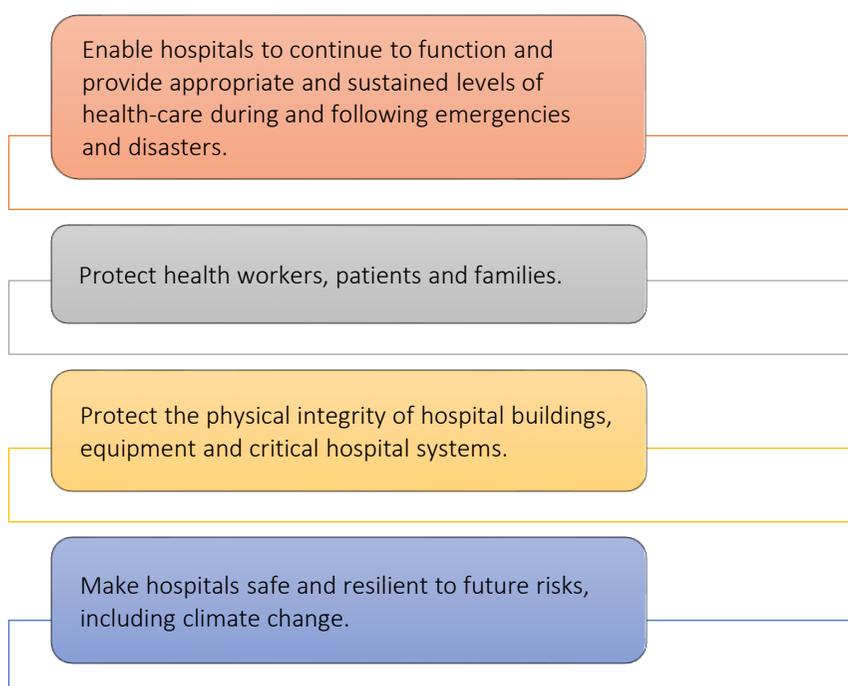


6.2.2 Assessment of Hospital Safety

In many countries, hospitals are the last shelter for disaster victims seeking refuge and the care they desperately need. Hospital systems also represent a major investment – up to 70% of the ministry of health budget – and are an indicator of social well-being. Losing a hospital may result in a loss of security, connectivity and trust in local communities. Yet the evidence shows that health facilities and health workers are among the major casualties of emergencies and other crises. The loss of emergency services during emergencies and disasters severely lessens the possibility of saving lives and reducing other health consequences (WHO, 2015a).

As pointed out in the previous sections of this report, OIC averages in terms of healthcare facilities is most often below the other country groups averages. More specifically, healthcare posts, centres and hospitals across the OIC were lagging behind world and non-OIC developing countries averages. These points to the seriousness of the issue and the need for OIC countries to increase their health facilities specially to counter emergencies. Along with the quantity of healthcare facilities, there is a need to make sure that they are built according to international regulations so that they withstand different types of hazards.

Figure 6.2: Four Objectives of the Comprehensive Safe Hospitals Framework (CSHF)



Source: WHO, 2015b

In 2015, WHO published the Comprehensive Safe Hospitals Framework (CSHF) to provide governments and health authorities with a more systematic approach to strengthening the safety and preparedness of health facilities for all types of hazards. It is to ensure that health facilities are safely built to withstand hazards and remain operational in emergencies. In designing new safe hospitals or taking measures to improve the safety of existing hospitals, there are four objectives as outline in Figure 6.2.

In this connection, the Pan American Health Organization (PAHO) and a group of Caribbean and Latin American experts as a tool to gauge the overall level of safety of a hospital or health facility in emergencies (PAHO, 2015) have developed the Hospital Safety Index (HSI). The HSI not only estimates the operational capacity of a hospital during and after an emergency, but it provides ranges that help authorities determine which hospitals most urgently need actions to improve their safety and functionality. Determining the HSI scores is an innovative way of managing risk in the health sector and OIC countries should join the efforts of measuring safety of health facilities and strengthening them accordingly.

6.2.3 Emergency Health Response Agencies and Regional Initiatives

Across the globe, Red Crescent and Red Cross societies are the main institutions that provide first aid and emergency response as well as epidemic control, programmes in health promotion and prevention, psychosocial care and community empowerment. Hundreds of thousands of volunteers work in these communities to promote health wellbeing and prevent diseases not only in case of emergencies but also in normal times.

Globally, there are 190 National Red Cross and Red Crescent Societies (NRCS) that are members of the International Federation. 157 of which are Red Cross Societies and 33 are Red Crescent Societies. In OIC countries, there are 33 Red Crescent Societies and 23 Red Cross Societies.² Only Oman does not have a national society that is a member of IFRC.

These societies and their millions of volunteers provide frontline response when emergencies strike. They provide immediate assistance for the victims and are involved in longer-term activities that save lives and improve health. Due to increasing number of disasters and conflicts, epidemics of infectious diseases cause vast numbers of deaths and disability every year. Outbreaks of infectious disease are more frequent in poor and fragile communities, which make it even harder to contain the disease and provide effective health care. NRCS can greatly contribute to the prevention of disease outbreak and connecting people and communities with the vital help they need.

² Following countries have Red Cross Societies: Albania, Algeria, Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Gabon, Gambia, Guinea, Guinea-Bissau, Guyana, Indonesia, Lebanon, Mali, Mozambique, Niger, Nigeria, Senegal, Sierra Leone, Suriname, Togo and Uganda. The remaining OIC countries have Red Crescent Societies.



Although there are vast differences in terms of capacities and capabilities across NRCS in OIC countries, there is no comparable indicator to evaluate the performance of these societies. Therefore, it is important to increase cooperation and partnership among NRCS in OIC countries to share experiences and transfer knowledge and capacities.

At regional level in OIC, the Islamic Committee of the International Crescent (ICIC) has been established as a specialized institution to increase cooperation among national societies in OIC countries and coordinate the humanitarian response. The Eighth Islamic Conference of Foreign Ministers, held in May 1977, at Tripoli-Libya, approved the principle of creation of this institution. It has been launched in 1982 with a secretariat in Benghazi, Libya. According to the information provided in their website, there are currently 18 OIC countries that ratified the ICIC agreement³ and another two are signatory countries⁴. The ICIC has many functions but it is mainly designed to undertake the below tasks.

- Provide relief and assistance in case of disasters.
- Provide services and care to victims of armed conflicts and taking peaceful initiatives in order to solve the resulting human problems.
- Build up close relations of cooperation with organizations operating in the field of humanitarian services, in particular with the Red Crescent and Red Cross.
- Contribute to the efforts exerted to establish better relations among people, promote solidarity to defend human rights, supporting the call for justice and peace, and preventing the risks of war.

In addition to NRCS, there are constantly increasing number of civil society organizations that target vulnerable and affected people to address their health and other humanitarian needs during and after emergencies. They play increasingly important role in this area, and with adequate support and facilitation, they can play even greater role in helping people and alleviating their health related deprivations.

6.3 Current Health Sector Situation in Conflict Affected Countries

Even though the OIC countries face a number of different natural and manmade hazards, conflicts across the OIC region requires particular attention. Currently, the number of conflicts in OIC countries is on the rise and so is their intensity. 60% of all conflict around the world occurs in OIC countries (SESRIC, 2019). As a direct outcome, today OIC countries account for 61.5% of all displaced population in the world with more than 25 million displaced people. More alarmingly, around 80% of all new internal displacement in the world during 2014-15

³ Ratified countries are Libya, Mali, Saudi Arabia, Iran, Syria, Tunisia, Sudan, Jordan, Qatar, United Arab Emirates, Comoros, Yemen, Morocco, Niger, Mauritania, Algeria, Iraq and Djibouti.

⁴ Signatory countries are Turkey and Guinea.



took place in OIC countries. Moreover, 71% (around 89 million) of people who globally require humanitarian assistance reside in OIC countries.

There are a number of conflict areas around the globe with severe health consequences. Table 6.5 shows the list of countries that are graded 3, 2 and 1 by the WHO. Grade 3 emergencies are those with a single or multiple country event with substantial public health consequences that requires a substantial response. Grade 2 emergencies refer to those situations in a country with single or multiple event requiring a moderate response. Finally, grade 1 emergency are those countries with a single or multiple event with minimal public health concern and requiring minimal response.

6 out of 9 countries with substantial public health concerns (Grade 3) are OIC countries. Moreover, 11 countries in the Grade 2 emergency are also from the OIC group. In total, 20 out of 35 countries with health concerns are members of OIC. It includes countries with health concerns due to conflicts as well as disease outbreak and some other reasons. Looking at Table 6.5, it becomes evident that OIC countries are facing a disproportionately higher number of emergencies especially due to conflict. Therefore, this subsection provides information on the current health sector situation in selected conflict affected OIC countries. The information has been mainly gathered from the WHO report on its 2017 humanitarian response plans (see WHO, 2017b).

Table 6.5: List of Countries with Health Concerns, Crises and Emergencies

	Grade 3	Grade 2	Grade 1
OIC Countries (18)	Iraq Mozambique Nigeria Somalia Syria Yemen	Afghanistan Burkina Faso Cameroon Iran Iraq Libya Mozambique Niger Palestine Pakistan Sudan	Chad Djibouti Mali
Non-OIC Developing Countries (13)	Ethiopia South Sudan DRC	Angola Burundi CAR Ethiopia Malawi Myanmar Sao Tome Ukraine Zimbabwe	Kenya Tanzania Namibia

Source: <https://www.who.int/emergencies/crises/en/>



Afghanistan: The continued conflict in Afghanistan is causing an increase in displacement. In 2017, more than 3.4 million Afghans were internally displaced due to conflict. Active conflict continues to threaten the physical safety and health of Afghans. Attacks against health facilities, patients, medical staff and vehicles continue to disrupt and deprive people of life-saving treatment. Four and a half million people live in conflict-affected districts with extremely constrained access to health services. Maternal and child health remains dangerously overlooked. Rates of infant and maternal mortality are among the highest in the world and severe acute malnutrition has passed emergency thresholds in 20 of 34 provinces. Around 1.8 million people require treatment for acute malnutrition.

Chad: Food insecurity, population movement and health emergencies are three main aspects of the humanitarian crisis in Chad that contribute to the vulnerability of the population. Women and children are the most vulnerable and there is a widespread lack of access to basic services. Chad currently has 580,000 displaced people. Over four million people are food insecure in Chad with nearly one million expected to be severely food insecure. The nutritional situation remains of concern with nearly 991,000 malnutrition cases expected in 2017. Malaria is the main cause of mortality for children less than five years old. There have been 400,000 confirmed malaria cases and over 7,000 deaths have been recorded since January 2017.

Iraq: The humanitarian crisis in Iraq remains one of the largest and most volatile in the world. Over 4 million Iraqis are currently displaced. During the past year, more than 750,000 people in areas impacted by the conflict have been newly displaced. In 2017, this number is expected to increase to as many as 1.2 to 1.5 million additional civilians. Displaced families require comprehensive emergency assistance including shelter, food, water, sanitation, household items, health care, education and specialized protection. The number of health consultations performed in health clinics has increased eightfold and more than half of the secondary and tertiary hospitals in Mosul have been damaged or destroyed. The shortage of safe water for populations trapped inside Mosul remains a concern as this increases the risk of outbreaks of water borne diseases.

Libya: Insecurity and violence across Libya have created unsafe living conditions and damaged critical infrastructure, which has placed people at high risk of injury and death, disrupted access to public utilities and services, and driven displacement. Around 1.3 million people have no access to life-saving health care services and resources. Public health facilities have been dramatically impacted. 43 out of 98 hospitals assessed are either partially functional or not functional at all due to an acute shortage of life-saving medicines, medical supplies and equipment along with critical shortages of human resources, particularly specialized nurses, midwives and technicians. These shortages are more pronounced at the primary care level. Consequently, referral and tertiary hospitals are overloaded with patients seeking help for common illnesses and are unable to meet the demand.

Mali: Almost half of the over 18 million people in Mali live below the poverty threshold of US\$ 2 per day. Mali has had armed conflict since 2012 and despite the signing of the peace



agreement in 2015, armed clashes continue with significant impact on the security of civilians. Insecurity has caused population displacement, limited access to social services including health care, food insecurity and nutritional crisis. The people of Mali are also vulnerable to epidemics, droughts and floods. In 2016, more than 18,000 people were affected by floods. More than 60,000 people may be at risk due to flooding in 2017. Access to health care remains limited overall in the country, particularly in Kidal where 22 of 32 existing health structures are non-functional. This is exacerbated by a shortage of skilled health workers in most parts of the country. Mali continues to be at high risk of outbreaks: in 2016, 500 cases of meningitis were recorded. In addition, humanitarian actors report an increase in the frequency of diarrhoeal disease cases among children related to the consumption of unsafe water, and respiratory infections due to inadequate shelter conditions. Food insecurity continues to be a major problem with 19% of the population experiencing food insecurity, including 485 600 people with severe food insecurity.

Nigeria: The humanitarian crisis in the six states of North-eastern Nigeria has intensified after eight years of violent conflict. The conflict caused widespread forced displacement, acute food and nutrition insecurity and serious human rights violations. Some areas remain inaccessible to humanitarian assistance. Violence caused mass displacement of people to neighbour countries. There is a high prevalence of severe malnourishment, morbidity and mortality. Lack of basic shelter, water, latrines and shower facilities increase the risks of communicable diseases, including cholera. This also exacerbates malnutrition among children under five. Water, Sanitation and Hygiene infrastructure must urgently be rehabilitated / rebuilt to minimize waterborne diseases.

Palestine: Palestine remains in the midst of a protracted crisis, now in its fiftieth year. In 2016, an estimated one million people are in need of humanitarian health and nutrition interventions; with 830,000 people in the Gaza Strip and 173,000 in the West Bank. In Gaza, hospitals and primary healthcare clinics struggle with chronic shortages of drugs, disposables and essential equipment, compounded by severe fuel shortages and prolonged electricity cuts. In the West Bank, access restrictions to health services remain a concern for patients and health workers, in particular in access-restricted areas affected by the security wall and checkpoints. Mobile health clinics are an essential lifeline for the affected communities.

Somalia: While conflict and environmental hazards have rendered many of the country's estimated 12.3 million people chronically or acutely vulnerable, 2017 presents the potential for drought to become the main driver of crisis. Continued political instability, forced evictions of internally displaced people (IDPs), ongoing-armed conflict, and long-standing environmental stress are some of the drivers of vulnerability in Somalia. The coverage and quality of basic social services in the country remains extremely low. Recurrent drought conditions drive food insecurity, malnutrition and are linked to disease outbreaks. Access to basic and lifesaving health care services remains a challenge that needs to be prioritized. Immunization coverage is considerably low and Acute Watery Diarrhoea/cholera, measles, malaria, and other communicable diseases outbreaks are constantly reported in many areas.



The rapid movement of IDPs has overwhelmed health facilities. Delivery of life-saving medicines and medical equipment has been irregular due to insecurity, road inaccessibility, electricity and fuel shortages and rupture of the cold chain. Overcrowding, lack of functioning referral systems, limited access to health services, unsafe water use and hygiene practice, and underlying malnutrition pose major challenges for the control and prevention of disease outbreaks.

Syria: Essential health services remain in critical shortage across the country. Insufficient human resources, supplies, equipment and infrastructure continue to disrupt the functionality of the health system. Over half of the public hospitals and almost half of its public health care centres either are closed or are only partially functioning. A severe shortage in skilled birth attendants and obstetricians means pregnant women lack access to critical childbirth services. One in five Syrians have moderate mental health issues, and 1 in 30 is at risk of developing severe or acute mental health needs. Even though this is an area of growing need, only 20% of functioning health facilities provides mental health care. Local health networks, connecting different levels of care through referral networks, remain fragmented, presenting a complicated path for patients seeking services. As access to life-saving medications and care is restricted, people with life-threatening, chronic diseases such as diabetes, kidney failure, asthma, epilepsy, cancer and cardiovascular illness are at continued risk of death or developing complications.

Yemen: Almost four years of war have devastated Yemen, leaving 18.8 million people in need of humanitarian and protection assistance. The conflict is rapidly pushing the country towards social, economic and institutional collapse. More than 7 million are facing food insecurity, and more than 8 million face acute shortages of clean water and sanitation. Nearly 3.3 million people are suffering from severe acute malnutrition. An estimated 14.8 million people lack access to basic health care, including 8.8 million living in severely underserved areas. As of October 2016, at least 274 health facilities had been damaged or destroyed, 13 health workers had been killed and 31 injured. The main causes of avoidable deaths in Yemen are communicable diseases, maternal, perinatal and nutritional conditions (together accounting for 50% of mortality) and non-communicable diseases (39% of mortality).

CHAPTER 7

Information, Research, Education, and Advocacy

There is a strong link between the level of information, education and advocacy and the health outcomes in a country. Research has established that many of the health concerns including diseases can be prevented by providing accurate and relevant information and education to the public, patients and health care providers. In this sense, information, education and advocacy are all complementary to each other. There are many health concerns that require accurate information to be given to the public and health care providers for them to be able to make healthy choices. Moreover, health information and education has recently started to evolve into health promotion and advocacy. Therefore, there is a move toward prevention and precautionary information, education and advocacy. The other element is having the right information and education for diagnosis and healing processes, which can save millions of lives around the world and in the OIC region. Against this backdrop, this section delves into a discussion on information, research, education and advocacy as it relates to health.

7.1 Health Education System

Health education is a vital component of the health system. Without the proper health education, a huge burden is experienced by countries in terms of economic costs, health of individuals and society and expansion of health issues. For example, scientific studies suggest that there is a huge disease burden in African countries because of the lack of health education. Therefore, health education is a salient issue of concern for individuals, communities, governments and society as a whole. The aim of health education is providing accurate and up to date information to wide range of actors including individuals, families, communities and health care providers. It aims to expand knowledge, raise awareness and provide the right skills and attitudes for individuals to make healthy choices.

Data on the number of health related schools and training institutions is very scarce across the globe. According to the latest available data from the WHO's World Health Report (2006),



globally there are 2420 medical schools, 467 schools or departments of public health, and an indeterminate number of postsecondary nursing educational institutions in 169 countries. These schools and institutions train about one million new doctors, nurses, midwives, and public health professionals every year.

There is a significant imbalance in the number of medical schools in terms of population size or national burden of disease especially in the developing world. Based on WHO's data (2006), with a total of 1935 operating medical schools worldwide, there is on average one medical school for every 3.3 million people in the world. Asia, with the largest population has the greatest number of medical schools (860). However, while over 60% of the world's population resides in Asia, only 44% of the medical schools are located there. Moreover, physician density is low, with less than one physician, on average, per 1000 population. In contrast, nearly 16% of the world's medical schools are located in North America while only 8% of the world's population resides there. The relatively large number of practicing physicians, especially in the North America, results in a continent-based density of 2.2 physicians per 1000 inhabitants. In Africa, there were only 126 medical schools, accounting for 6.6% of the world total. Table 7.1 shows the countries with the most active medical schools around the world.

Table 7.1: Countries with the most Active Medical School in the World (top 20).

Country	Number of Medical School	% Share of Total
India	219	11.3
USA	147	7.6
China	130	6.7
Brazil	84	4.3
Japan	80	4.1
Mexico	65	3.4
Russia	60	3.1
South Korea	52	2.7
Iran	48	2.5
France	46	2.4
Italy	39	2.0
Turkey	37	1.9
Germany	36	1.9
Pakistan	34	1.8
Philippines	34	1.8
Columbia	32	1.7
Indonesia	32	1.7
UK	29	1.5
Peru	28	1.5
Spain	26	1.3

Source: Boulet et al., 2017

Out of the top 20 active medical school in the world, four of them are OIC countries. These are Iran with 48 medical schools, Turkey with 37, Pakistan with 34 and Indonesia with 32,



accounting for 2.5%, 1.9%, 1.8% and 1.7% of the total world shares respectively. There was only one active medical school in Guinea Bissau, Gabon and Surinam from the OIC countries.

There were relatively few countries with populations of greater than four million that had no medical schools (Eritrea and Somalia). At the individual country level, nearly half of all the world's medical schools are located in 10 countries including India, USA, China, Brazil, Japan, Mexico, Russia, South Korea, Iran, and France. On the other hand, 26 countries from Sub-Saharan Africa have one or no medical schools (Frenk et.al, 2010).

Adequate numbers of appropriately qualified human resources for health (HRH) are a critical component of any effective health system. Many regions suffer from a shortfall of health personnel. Africa represents the highest global shortfall in human resources for health. A major setback for the African region has been the migration of large numbers of highly trained doctors, educated in these countries, outside the continent (Clemens MA and Peterson G, 2008). For example, over the ten-year period from 2002 to 2011, many Sub-Saharan countries experienced decreases in physician densities because of increasing migration (Tankwanchi ABS, et.al., 2013). In addition, until 2010, eight Sub-Saharan countries had no medical schools of their own, which necessitated dependence on expatriates and external training (Chen C, et.al. 2012). The evidences show that it is very urgent and important to develop and establish health education systems for the countries that do not have the medical schools yet.

Looking at the health education institutions across the OIC region, it becomes evident that more needs to be done to establish health educational facilities. With the world's youngest population, the OIC countries need to provide the educational facilities that are needed for young people to pursue education in the medical field. It is not only enough providing an educational institution but there also needs to be other facilities to complement it such as laboratories, testing equipment and relevant technological apparatuses. Along with educational institutions, the quality of health education makes up an important part of the health education system.

7.2 Quality of Health Education

Quality of health education directly affects health outcomes. Education is critical to social and economic development and has profound impacts on population health. Medical education will certainly affect practice patterns and influence career choices, thereby having a distributed net effect on population health, especially in underdeveloped regions or those countries where relatively few practitioners are being trained. A major transformative opportunity for improving health among diverse communities worldwide is to reform the vision, programmes, and systems of educational institutions to train health professionals who can meet people's needs, empower communities, and enhance human wellbeing.

Too often overlooked is the fact that the production of health is knowledge-based and socially driven, and health professionals as knowledge brokers are key drivers of health progress (Zulfiqar Bhutta, et.al. 2010). Providing training that will ensure an adequate global healthcare



workforce is essential. However, in today's global environment, where there are increasing demands on healthcare systems, physicians are free to move from locale to locale or even from country to country. More importantly, for many of these individuals, there have been, and continue to be, numerous options as to where the medical training can take place, including institutions located outside their home countries. As a result, obtaining information on the distribution and quality of training institutions is critical to health workforce planning (WHO, 2006).

Over four million people worldwide lack access to quality health services, in large part because of a huge shortage, imbalanced skill mix, and uneven geographical distribution of health workers. The WHO estimates that an additional 4.3 million health workers are needed worldwide. The health workforce crisis has disastrous implications for the health and well-being of millions of people, yet not enough health workers are being produced to close this shortfall. Scaling up educational programs to produce multi-disciplinary service delivery teams - which include a carefully balanced mix of clinicians, community health workers and health managers - is clearly urgent and essential. However, simply increasing the numbers of workers will not be enough. The shortage of health workers is compounded by the fact that their skills, competencies, clinical experience, and expectations are often poorly suited to the health needs of the populations they serve (WHO, 2017).

A health system cannot work adequately without sufficient health workers. According to the WHO, 83 countries have less than 23 doctors, nurses and midwives per 10,000 people. They are the world's poorest countries, and this shortage is described by the WHO as 'one of the most critical constraints to the achievement of health and development goals. In 2006, it was estimated that 25% of all doctors and 5% of nurses that were trained in sub-Saharan Africa were working in Organization for Economic Co-operation and Development (OECD) countries.

While recent data does suggest that, in some of these countries, the influx of internationally trained health workers has stabilized or declined overall migration of health personnel to OECD countries has increased. Many of these personnel are trained at public expense. This means, essentially, that wealthy countries are benefitting from the funds poor countries are investing in training health workers (Humanosphere, 2014). Not only are health care workers migrating but also educators are migrating. The migration of health workers affects all countries in one way or another. In some cases, health workers leave their home countries looking for better working conditions and career opportunities abroad. In others, they leave rural areas for urban ones. The result is an increasingly inequitable access to health care, within and between countries. WHO is working with a wide range of stakeholders to find answers for scaling up the health workforce to increase the quantity, and to improve the quality and relevance of health workers to meet the needs of the 21st century and to contribute to better population health outcomes (WHO, 2017).

Perhaps the most important thing about health education is that one should never simply assume that the educational materials, information and procedures used are effective. A lecture or intervention that appears to be efficacious may yield completely unexpected results



and even be detrimental. Effective health education relies heavily on continual testing to ensure compliance and knowledge comprehension, to generate data that can be used to measure the efficacy of the health care work and to improve future health care education, as well as to rectify and address areas of concern as soon as they occur.

Furthermore, this educational data-gathering and continual testing requires the presence of baseline “pre-testing” to establish the impact of the developed materials; educators need to gauge a student’s prior knowledge to measure the effectiveness of the education. This prior knowledge has been shown to have a substantial influence on a student’s observations, learning receptiveness, and perceptive beliefs. Therefore, most health education programs should implement some means of testing a student’s prior knowledge, by employing non-leading questionnaires, surveys and conversations amongst others. After adequate pre-testing is achieved, educators should begin their proposed health education program. Learner follow-up should then be performed. In regard to this, there are various measures that researchers and educators can adopt to evaluate the outcomes of their health education, including:

Changes in Knowledge: Demonstrated changes in student responses towards non-leading pre-determined questions, surveys, questionnaires, and/or other measures that relate to the specific material addressed by the health educational program. Ideally, an effective health program will result in changes that demonstrate increased factual accuracy and knowledge about specific medical and health-related issues for a prolonged period of time (Estabrooks C.A et.al. 2003).

Changes in Behaviour: Effective health education will yield both short-term and long-term changes in behaviour that reduce risky behaviour and/or improve quality-of-life. These changes in behaviour can be recorded through evaluator observations and learner feedback, or through more formal means, such as questionnaires and surveys. Importantly, the extent of a student’s behavioural change and maintenance depends heavily on the learner’s beliefs, specifically concerning the expectations of the outcomes stemming from behavioural change as well as personal expectations about one’s ability to undergo behavioural change.

Learner/Participant Satisfaction: A subjective measure based on the learner’s perceived expectations regarding their overall experience and the actual outcome. Generally, learner/participant satisfaction data is gathered through questionnaires or surveys; the data can be used to improve health education programs through the targeting of specific changes noted by the prior participants (Appleton-Knapp, 2009).

Cost-Effectiveness Analysis (CEA): Strictly speaking, CEA is the estimation of the net costs and effects of any action. In health education, CEA provides a way for program developers to illustrate quantitatively the “opportunity cost” of a decision: the possible socio-educational-medical benefits lost in exchange for the execution of another program. In this sense, it provides an additional metric for health workers to make informed judgments in creating an effective health educational program (Gold Marthe R, 1996).



The total global expenditure for health professional education is about US\$100 billion per year. This amount corresponds to less than 2% of all health expenditures worldwide, which is a small figure for a labour intensive industry. A study reported that the average cost per graduate in the world is about \$113,000 for medical students and \$46,000 for nurses (Frenk et.al, 2010). The key challenges to ensuring access to quality nursing education in OIC countries pertain to inadequate investment and low priority given to nursing education; lack of capacity in nursing schools in terms of the availability of trainers as well as infrastructure; the need to further update nursing curricula in order to bridge the service-education gap; the limited institutional capacity to offer post-basic training programmes; and inadequate emphasis on continuous professional development programme (SESRIC, 2015). Every single country is trying to improve their quality of education however there are so many challenges in OIC countries like any other developing countries due to economic problem, unstable politics, war, civil war, lack of professionalism, lack of human resource, lack of experiences in the field and other factors.

7.3 Adverse Drug Reactions and Irrational Use of Medicines

Medicine use is rational (appropriate, proper, correct) when patients receive the appropriate medicines, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost both to them and the community. Irrational (inappropriate, improper, incorrect) use of medicines is when one or more of these conditions are not met. Irrational use may take many different forms. For example, polypharmacy, over-use of antibiotics and injections, failure to prescribe in accordance with clinical guidelines and inappropriate self-medication.

Worldwide, it is estimated that over half of all medicines are prescribed, dispensed or sold inappropriately (WHO, 2009). Moreover, it has been estimated that half of all patients fail to take their medication as prescribed or dispensed (Sabaté E, 2003). Adverse drug reactions and irrational use of medicines is an extremely serious global problem that is wasteful and harmful. In developing and transitional countries, less than 40% of patients in the public sector and 30% of patients in the private sector are treated in accordance with the standard treatment guidelines (Kathleen Holloway and Liset Van Dijk, 2011). However, despite the global problem of inappropriate use, few countries are monitoring medicines use or taking sufficient action to correct the situation (WHO, 2006).

Antimicrobial resistance is dramatically increasing worldwide in response to antibiotic use, much of it due to inappropriate overuse (and is causing significant morbidity and mortality (WHO, 2009). It has been estimated that antimicrobial resistance costs annually US\$ 4000–5000 million in the USA and €9000 million in Europe (SCRE, 2004). The use of unsterile injections is associated with the spread of blood borne infections, such as hepatitis B and C and HIV/AIDS. Although evidence based medicine has gained importance the use of both diagnostic and treatment guidelines is sub-optimal and could be greatly improved.

The inappropriate use of medication is commonly occurred in health care systems globally, but widely observed in developing countries. Common examples of irrational use of medications including the usage of too many medications especially among geriatrics, overuse of antibiotics even for non-bacterial infections, overdose or under dose of some medications, widely prescribing of injection when oral is effective, self-medication and prescribing pattern that not according to the approved clinical guidelines (Akl OA et.al., 2014).

Table 7.2: Interventions to Promote Rational Use of Medicines

- A mandated multi-disciplinary national body to coordinate medicine use policies
- Clinical guidelines
- Essential medicines lists based on treatments of choice
- Drugs and therapeutics committees in districts and hospitals
- Problem-based pharmacotherapy training in undergraduate curricula
- Continuing in-service medical education as a licensure requirement
- Supervision, audit and feedback
- Independent information on medicines
- Public education about medicines
- Avoidance of perverse financial incentives
- Appropriate and enforced regulation

Source: WHO, 2006

In developed and some transitional countries, where a large proportion of the population is covered by health insurance, the health insurance agencies may play a significant role in promoting rational use of medicines by only reimbursing prescriptions that comply with clinical guidelines or that contain essential medicines. In some high- and middle-income countries, insurance agencies are reimbursing medicines according to whether they are essential medicines, generic medicines or approved for a certain use. However, in many low-income countries, insurance coverage is low and there is insufficient infrastructure to establish health insurance in the short term. A major future challenge will be to persuade governments, donors, and the international community to invest sufficiently in promoting rational use of medicines.

The lack of understanding of some aspects of medicines use lead to dangerous actions such as considering that using two medications better than one, or thinking that using two doses are more effective than one, or thinking injections are more effective than pills, as well as using traditional medicines alongside with prescribed medicines without physician's consultation (Abbott et.al., 2009). The irrational use of drugs is one of the health problems that the WHO is trying to manage by developing guidelines like essential medicine list and effective prescribing. According to the WHO, public information and education on medicines use are key elements in national drug policy. Despite progress in some countries, however, necessary human and financial resources are still limited for medicine use education for the



public. It is usually dealt with a marginal activity or one to be tackled only when the other elements of drug policy are in place (Management Sciences for Health, 2012).

Medicine education and advice from health care professionals can build a well-informed patient about medicines use. Patient education may reduce the events of adverse drug reactions. Nowadays, information sharing is an important need for patients to use their medicines properly. Patients would like to receive information regarding the safety aspects of medicines that they use through various sources. Continuous efforts are needed for promoting the quality use of medicines. The health educational programs should be more focused on the appropriate use of medicines. In some countries, information leaflets are limited, and people do not know how to get the accurate information (WHO, 2006). The health care professionals need to play an active role in developing health education programs and connect with independent information centres for drug-related information.

Especially in poor communities, unqualified persons without any control sell medications in many markets from the local health authorities. The continuous wide spreading of irrational use of medications has negative health and economic outcomes influencing both consumers and governments. Health care professionals can reduce drug related problems among consumers when working together collaboratively by educating, counselling and providing evidence-based information to the medicine consumers in order to optimize medicine use.

7.4 Checks and Balances to Control Malpractices

Medical malpractice involves patient damage, injury or death attributed to negligent behaviour by a medical practitioner or other health care professionals (Ritchey FJ, 2014). Often patients (or their families), who think to have been victims of medical malpractice, file claims against health care providers. This possibility has a potentially strong impact in terms of costs and reimbursements, and it leads doctors, other health care professionals and health care organizations to underwrite liability insurance policies to offset their risks. There are very limited data available regarding malpractice worldwide. Most of the countries do not collect and report data on the malpractice incidences.

According to some estimates, as many as 18,000 people die every year because of medical error, while 50,000 people suffer a permanent injury (Emily B., 2013). A recent study by John Hopkins claimed that more than 250,000 people in the US die every year due to medical errors (John Hopkins, 2013). Misdiagnosis and missed or delayed diagnoses are major causes of malpractice complaints. When a doctor misdiagnoses a condition or, alternately, fails to diagnose a condition for some period, the patient could miss treatment opportunities that might cause serious harm or death.

Indeed, a misdiagnosis could lead to the prescription of treatments that are not appropriate for the patient, also potentially resulting in harm. A number of injuries can be caused by medical malpractice to a foetus during pregnancy or to a child during the birth process. Some of these injuries can be quite severe, such as brain injuries (like cerebral palsy and seizure

disorders), fractured bones, and full or partial paralysis. Of course, many of these are caused by natural causes, as well. Nevertheless, if a doctor's negligence caused these conditions or the doctor failed to take steps to treat a condition that could lead to these conditions, medical malpractice may have occurred.

Medication Errors: Medication errors are one of the most common forms of medical malpractice and can occur many ways. For example, a doctor might make a mistake on the initial prescription, administer a drug inappropriately, or fail to take notice of a potentially harmful drug interaction. In a hospital setting, one common form of injury results from the wrong medication being given to the wrong patient. However, the most common medication errors, by far, involve improper dosage.

Anaesthesia Errors: Anaesthesia mistakes are relatively infrequent but can be more dangerous than surgery mistakes. Even small error by the anaesthesiologist can result in permanent injury, brain damage, or death. Typical causes of malpractice by anaesthesiologists include failing to investigate the patient's medical history for possible complications or failing to inform the patient of necessary preoperative procedures (like not eating for a certain period before surgery). Other common anaesthesia errors include giving too much anaesthesia to the patient, failing to monitor the patient's vital signs, improperly putting a tube in the trachea to assist the patient with breathing ("intubation"), or using defective equipment.

Surgery Errors: Occasionally, a surgeon might make a mistake in the operating room. A surgeon might make negligent errors during the surgery itself, like puncturing an organ or blood vessel, operating on the wrong body part, or leaving surgical equipment inside the body. Alternatively, nursing staff could be negligent in postoperative care, resulting in giving the wrong medications, using improper procedures that could lead to infection, or failing to give the patient adequate instructions for their own postoperative recovery needs.

7.5 Social and Cultural Issues related to Health Services

It is now widely recognized that health outcomes are deeply influenced by a variety of social and cultural factors outside of health care. An understanding of cultural differences and attitudes is needed for effective healthcare to be delivered appropriately. All cultures have systems of health beliefs to explain what causes illness, how it can be cured or treated, and who should be involved in the process.

Cultural issues play a major role in patient compliance. The extent to which patients perceive health services in compliance with their cultural values has a profound effect on their reception to information provided and their willingness to use it. Usually, in developed societies diseases are regarded a result of natural scientific phenomena and authorities advocate medical treatments that combat microorganisms or use sophisticated technology to diagnose and treat disease. Whereas; in some other social and cultural context people believe that illness is the result of supernatural phenomena and therefore, only spiritual intervention is enough to get rid of it.



The increasing diversity of the nation brings opportunities and challenges for health care providers, health care systems, and policy makers to create and deliver culturally competent services. Cultural competence is defined as the ability of providers and organizations to effectively deliver health care services that meet the social, cultural, and linguistic needs of patients (Betancourt, et.al., 2002). A culturally competent health care system can help improve health outcomes and quality of care and can contribute to the elimination of racial and ethnic health disparities. Examples of strategies to move the health care system towards these goals include providing relevant training on cultural competence and cross-cultural issues to health professionals and creating policies that reduce administrative and linguistic barriers to patient care.

The extended family has significant influence, and the oldest male in the family is often the decision maker and spokesperson in majority of developing societies. Usually, the interests and honour of the family are more important than those of individual family members are. Older family members are respected, and their authority is often unquestioned. Usually, a key family member is consulted for important health-related decisions. Among Asian cultures, maintaining harmony is an important value; therefore, there is a strong emphasis on avoiding conflict and direct confrontation. Due to respect for authority, disagreement with the recommendations of health care professionals is avoided. However, lack of disagreement does not indicate that the patient and family agree with or will follow treatment recommendations. Among Chinese patients, because the behaviour of the individual reflects on the family, mental illness or any behaviour that indicates lack of self-control may produce shame and guilt. As a result, Chinese patients may be reluctant to discuss symptoms of mental illness or depression.

African continent is one of the largest continents of the world and it is a multi-ethnic society with its peculiar nature and diverse practices. For example, Nigeria, as a country, is made up of people from different ethnic groups and cultural practices. It has more than 250 ethnic groups with different cultural practices. Some of these cultural practices, which have endured centuries of practice work for the people. It is not uncommon to think of something crude and bad whenever one talks about cultural practices as it concerns health. Through different programmes, children and young people can be taught to overcome the social and cultural practices that are detrimental to healthy lives. Box 7.1 highlights a program employed in Indonesia to overcome such obstacles and provide training.

Box 7.1: The Little Doctor Programme of Indonesia

In Indonesia, non-curricular health education called "Penyuluhan Kesehatan" is carried out as an integral part of school health services. An important input to this is the "Dokter Kecil" or Little Doctor programme, which has the personal support of the President. The programme uses a group of students to serve as prime movers and motivators for changes promoting better health in the school, home and community. Children from grades IV to VI are selected by teachers to serve as little doctors based on leadership potential, willingness to help others and observance of good personal hygiene.

The responsibilities of the little doctor include: setting a good example by following a healthy life-style, observing good personal hygiene and avoiding health risk behavior; active participation in improving environmental conditions with reference to disposal of sewage and refuse, protecting safe water sources and food storage, and cleanliness of rooms; communicating messages on diarrhea prevention, immunization, mosquito control, etc.; monitoring personal hygiene, growth, eyesight, oral health, scar survey (BCG) and deviations from health such as skin and eye infections; informing teachers about children needing attention; providing simple treatment including first aid and referral of cases; maintaining a health log book/diary; writing personal reports; and presenting health facts using graphics.

The little doctors are given initial training, which includes 20 lesson hours. Problem solving and active participation are encouraged. The training is evaluated through tests, essays, skill assessment, role-play and group discussions. The work of the little doctor is monitored, and the impact on the school and the community is observed.

Source: WHO, Action for Public Health, 1991

Many cultural practices have helped to perpetuate and increase the prevalence of certain diseases and health problems. However, not all cultural practices and beliefs are bad. Many have withstood centuries and actually promote health. Most of the negative practices are due to ignorance and non-availability of better alternatives. Efforts should be made to encourage those practices that promote health and then, through the provision of information and better health care services, discourage those that harm human health.

Authorities in countries like Nigeria and Pakistan have often reported the opposition of religious and political groups to carry out national polio vaccination campaigns. To overcome this problem, the OIC GS secured a religious injunction from the Islamic Fiqh Academy, which issued a fatwa to encourage the Muslims to participate and support the national polio vaccination campaigns. Quoting extensively from the Qur'an, the fatwa lays out the duty to protect children when disease is preventable. Thus, the fatwa addresses the critical need to raise awareness in Muslim communities about the benefits of polio immunization campaigns. However, there is a strong need for similar fatwas to support all kinds of immunization campaigns in OIC countries (SESRIC, 2014).



7.6 Public Health Awareness Schemes

Public health is the science of protecting and improving the health of families and communities through promotion of healthy lifestyles, research for disease and injury prevention and detection and control of infectious diseases. Overall, public health is concerned with protecting the health of entire populations. These populations can be as small as a local neighbourhood can, or as big as an entire country or region of the world. Public health professionals try to prevent problems from happening or recurring through implementing educational programs, recommending policies, administering services and conducting research – in contrast to clinical professionals like doctors and nurses, who focus primarily on treating individuals after they become sick or injured. Public health also works to limit health disparities. A large part of public health is promoting healthcare equity, quality and accessibility.

Information Communication Technology (ICT) has proven to be a strong public health tool. In developing countries, preventable diseases and premature deaths still inflict a high toll. Inequity of access to basic health services affects distinct regions, communities, and social groups. Under-financing of the health sector in most countries has led to quantitative and qualitative deficiencies in service delivery and to growing gaps in facility and equipment upkeep. Inefficient allocation of scarce resources and lack of coordination among key stakeholders have led to duplication of efforts, overlapping responsibilities, and resource wastage. Most countries are at some stage of health sector reform, trying to provide expanded and equitable access to quality services while reducing or at least controlling the rising cost of healthcare. Health reform processes have many facets and there is no single model being adopted by all countries.

ICTs have the potential to make a major contribution to improving access and quality of services while containing costs. Improving health involves improving public health and medical programs designed to provide elective, emergency, and long-term clinical care; educating people; improving nutrition and hygiene; and providing more sanitary living conditions. These in turn ultimately involve massive social and economic changes, as many health challenges go well beyond the health sector.

The health sector has always relied on technologies. According to WHO (2004), they form the backbone of the services to prevent, diagnose, and treat illness and disease. ICTs are only one category of the vast array of technologies that may be of use. Given the right policies, organization, resources, and institutions, ICTs can be powerful tools in the hands of those working to improve health. Embedded in this are issues of broadcasting rights and regulations controlling the media. Connectivity access measured in terms of telephone access, personal computer ownership, and Internet connectivity. Inequitable access also exists within societies. Within developing countries, segments of the population have been by-passed by the products of the information revolution. This is complicated by the fast-changing deployment of new technologies and accompanying standards that constantly raise the level of advancement that must be met by anyone who wants to remain current (Ishaq, 2001). This is part of a set of much broader constraints that include insufficient telecommunications infrastructure, high telecommunications tariffs, inappropriate or weak policies, organizational

inefficiency, lack of locally created content, and uneven ability to derive economic and social benefits from information-intensive activities.

Recent studies have identified a strong connection between the use of the telephone and an increased demand for health services in Bangladesh, Peru, and Laos. The analysis at the household level shows that basic telephone service offers opportunities in delivering timely information on health services to households with relatively greater demand for this type of information. Health workers will be able to track and monitor patients' symptoms using mobile phones with text capabilities in conjunction with a central database. For example, visiting nurses in the field might ask people living with HIV or people with TB a series of yes/no questions about their status, symptoms, and reactions to particular medications.

The most enduring and established of ICTs, radio continues to maintain a central position in developing country health communication. Health workers in villages can now carry VCD and DVD players that can communicate a basic message, which can then be followed through with discussion. In the past, video has been expensive to make and difficult to show in rural areas. Production of a video can now be done on a basic computer, and the cost of making a local language video produced by local health workers is less than a few hundred dollars. Portable digital players can be easily used to show the video. This process is only going to get easier. The NGO Gamos has explored this in Mexico, Moldova, South Africa, Cambodia, and Ghana. Impact studies show a remarkable change in knowledge and behaviour based on the videos. In Ghana a number of agencies, including the Health Foundation of Ghana, have now trained their staff and are beginning to develop local language videos that can be shared with each other (Gamos, 2005).

Some OIC countries have already started to use ICT in health widely; Turkey is one of these countries (Tatar, 2011). The healthcare information technology (IT) infrastructures in Turkey include Sağlık-Net (Turkish for "Health-Net"), Centralized Hospital Appointment System, Basic Health Statistics Module, the Core Resources Management System, and the e-prescription system of the Social Security Institution. The Sağlık-Net has two main components: The National Health Information System (NHIS) and the Family Medicine Information System (FMIS). The NHIS is a nation-wide infrastructure for sharing patients' Electronic Health Records (EHRs). So far, EHRs of 78.9 million people have been created in the NHIS. Similarly, family medicine is operational in the whole country via FMIS. Centralized Hospital Appointment System enables the citizens to make easily appointments in healthcare providers.

Basic Health Statistics Module is used for collecting information about the health status, risks and indicators across the country. Core Resources Management System speeds up the flow of information between the headquarters and Provincial Health Directorates. The e-prescription system is linked with Sağlık-Net and seamlessly integrated with the healthcare provider information systems. Finally, Turkey is involved in several international projects for experience sharing and disseminating national development. While some countries still using classic technologies due to enabling telecom policy and regulatory environment, lack of access to electricity, solar power options, and power supply back-ups, insufficient infrastructure and connectivity access, and high costs.



CHAPTER 8

Concluding Remarks and Policy Recommendations

The 57 OIC member countries cover a large geographical area, spread out on four continents, extending from Albania (Europe) in the North to Mozambique (Africa) in the South, and from Guyana (Latin America) in the West to Indonesia (Asia) in the East. The OIC countries constitute a substantial part of the developing countries, and, being at different levels of economic development, they do not make up a homogenous economic group. The mixed nature of the group of the OIC countries reflects high levels of heterogeneity and divergence in the economic structure and performance of these countries. The degree of heterogeneity in the macroeconomic and developmental profiles of OIC countries also reflects in their performance in the health sector.

The health care coverage situation remained significantly poor in many OIC countries mainly due to the lack of adequate and sustainable financial resources, insufficient trained health workforce and poor health infrastructure. Currently, OIC countries allocate only 4.6% of their GDPs for health whereas health expenditures account only 8.4% of their total government expenditures. Out-of-pocket health spending remained the most widely used method for health financing, accounting for 36% of total health spending and 82% of private health expenditures. At the individual country level, out-of-pocket health expenditures account for more than 50% of total health expenditure in 16 OIC countries. On the other hand, average density of health workers in OIC countries is just above the critical threshold of 23 health personnel (doctors, nurses and midwives) per 10,000 people, generally considered necessary to deliver essential health services, and even less than 10 hospital beds are available for 10,000 people in OIC countries.

Over the years, many OIC countries have made significant progress in terms of fulfilling women and children's right to health, with more resources than ever being invested in the primary health care services. Although, on average, maternal mortality rate has declined by 44% between 1990 and 2015, many member countries have missed the MDG5 target of three-quarters reduction by 2015. A similar situation prevailed for the under-five mortality rates, as the reduction of 52% was not enough to achieve the MDG4 target of two third reductions in child mortality by the end of



2015. Nutrition and food security are another major area of concern for the OIC countries. As a result, not only the risk of child death from common illness such as diarrhea, pneumonia, and malaria remained quite elevated in OIC countries but also many children are suffering from physical and cognitive impairments caused by the malnutrition and deficiencies of vital micronutrients like vitamin A, iodine and iron.

An analysis on the state of disease prevention and control shows that, on average, OIC countries improved their stance and many of them achieved to reduce mortalities caused by CDs and NCDs. However, the average of OIC countries in many diseases and risk factors still stay higher than the average of developed countries as well as the world average. This implies the existence of problems related with disease prevention and control as well as problems associated with the equal access to health services between male and female population in OIC countries. In other words, OIC countries, on average, still have a long-way to go and reach the level of developed countries in prevention and control of many diseases. Both communicable and non-communicable diseases are responsible for around 89% of all deaths in OIC countries.

OIC countries, as a group, remained net importer of pharmaceuticals and with few exceptions, the majority of them have very low pharmaceutical production base. Considering the relatively high cost of health care, due to unavailability of medicines, many OIC countries have to make some serious efforts to boost the pharmaceutical industry in their economies. Medical devices are also one of the most important health intervention tools available for the prevention, diagnosis and treatment of diseases, and for patient rehabilitation. However, availability and procurement of these devices is an ongoing challenge in many OIC countries.

Emergencies and disasters can put the continuity and sustainability of health sector services at risk and destroy many years of health sector development. They may create severe health problems directly as a result of the hazard or through the disrupting health system, facilities and services, and limiting access to health care. Conflict-affected countries experience severe consequences in health services and outcomes. Although some OIC countries has made progress in managing disaster risks and associated health response, the capacities of many countries remain extremely variable. There are large discrepancies across countries in terms of emergency health management capacity. In order to make a comprehensive analysis on the existing capacities of OIC countries, there is a need for assessment studies for each country.

Changes seen in the characteristics of patients and developments observed in technology increased concerns on the quality of health education and training of health professionals all across the world. The quality of health education at medical schools and nursery schools has not been matched fully with the demands of patients and their necessities. Moreover, these educational schools, even in developed countries, could not equip prospective health professionals with the use of the state-of-the-art technologies and interpretation of data obtained from patients appropriately. OIC countries are not an exception of these facts. Furthermore, there is a strong link between level of public awareness and health outcomes in a country. It has been established through research that most of the diseases can be prevented by imparting accurate and relevant information and education to patients and health care providers. According to the WHO, majority of heart diseases, strokes, Type 2 diabetes and cancer cases could be prevented just by educating and informing people about healthy diet, physical



activity/exercise and not using tobacco. Over one million lives per year could be saved by promoting breast feeding until at least two years and a bulk of under-five deaths could be avoided by educating parents about importance of nutrition and efficient use of their food money which they sometimes spend on sweets for their children to give them as treat.

Against this backdrop, following policy recommendations have been suggested to enhance the implementation of interventions at both national and intra-OIC and international cooperation level to improve the state of health in OIC countries.

Health System Strengthening

Health system strengthening requires a wide range of actions both at national and regional level. Majority of the OIC countries rely heavily on out-of-pocket expenditure to finance health services whereas the share of social security and private health insurance in total health expenditures remained comparatively very low. This has been one of the major obstacles to provide health services to the low income poor groups of the society. This state of affairs necessitates fundamental reforms in health financing system to enable wider access to health services. The reforms require continued increasing investment and public spending on health, reducing out-of-pocket spending and increasing pre-payment and risk-pooling, which may include tax-based financing, compulsory social insurance and other types of health insurance. There is sufficient fiscal space to increase the budgetary allocations for health sector and to establish an accountability mechanism to ensure transparent and efficient use of these funds. There is a need to take necessary policy measures to facilitate Intra-OIC investment in health sector and enhance collaboration with international agencies like WHO, UNICEF and World Bank to benefit from their expertise and financial contribution to build health infrastructure. Learning from the best practices, OIC countries should start prepayment and risk pooling based health financing schemes like Seguro Popular in Mexico, New Rural Cooperative Medical Scheme in China and Social Health Insurance Scheme in Mali to overcome financial barriers to health care access especially in rural areas.

Demographic and epidemiological changes, introduction of new technologies and initiation of new treatment methods all contribute to the growing need to deal with the status, performance and problems of health workers. In this respect, a comprehensive assessment should be made related to the number of people to be trained, diversity of workforce to be prepared in proportion to demographic and socio-cultural characteristics of population and capability of health workers to be developed when performing tasks assigned to each health worker. Insufficient health workforce in the OIC countries indicates low level of healthcare capacity and services, a threat which necessitates encouraging development of more adequate human resources in the fields of medicine and healthcare. In order to overcome the shortage of well-trained efficient health workforce, OIC countries need to focus on establishment of a health service commission for training, recruitment and management of health workforce at both national and Intra-OIC level and enhancement of cooperation both at national and Intra-OIC level to increase investment in health education and training institutions. There is also a need for increasing scholarship programs to attract more students in health professions and mutual recognition of medical diplomas, certificates and degrees. Financial and non-financial incentives should be devised to improve the supply of health workers in rural and remote areas. Enhanced level of cooperation



with NGOs and international bodies could also pave the way for training and deployment of health workers at the community level (like community midwives in Indonesia and Lead Health Visitor (LHV) program in Pakistan) to provide especially MNH services in rural areas.

Disease Prevention and Control

Policymakers need to formulate effective strategies in order to promote and raise public awareness on healthy lifestyles. In order for OIC countries to achieve this, both in terms of prevention and control of CDs and NCDs, they need to develop and implement effective strategies in line with the international guidelines and in cooperation with the relevant international organisations. In this context, the OIC SHPA 2014-2023 provides a window of opportunity to enhance cooperation among OIC countries in disease prevention and control. The existing WHO Guidelines also propose strategies in combating with several communicable and non-communicable diseases that can be applicable to many OIC countries.

Building up mechanisms and platforms to share country experiences and transfer best-practises will help many OIC countries to develop and adopt effective prevention and disease methods with a zero cost. In this context, the Reverse Linkage Programme of the Islamic Development Bank constitutes an important benchmark programme that needs to be explored and utilised by OIC countries.

The existence of heterogeneity in terms of development profiles of OIC countries also reflects in their performance in disease prevention and control. In other words, the necessities and priorities of OIC countries can vary significantly in the domain of disease prevention and control depending on their climate, quality of infrastructure, available public funds etc. Therefore, international guidelines and intra-OIC cooperation have their limits to help OIC countries in disease prevention and control. In this regard, the lion share of the responsibility in disease prevention and control still remains with national policymakers, experts and civil society in OIC countries. Therefore, training of policymakers, experts and civil society is an integral part of developing and implementing a successful disease prevention and control strategy in order to equip them with the recent scientific knowledge, information and state-of the art technologies to combat with diseases. In this context, OIC countries can extensively benefit from training and capacity building programmes of the Statistical Economic and Social Research and Training Centre for Islamic Countries (SESRIC) in the domain of health, which aim to foster intra-OIC cooperation especially through matching the needs and capacities of the member countries and facilitating the transfer of knowledge and best practices among them.

Maternal, New-born and Child Health and Nutrition

State of maternal, new-born and child health and nutrition remained significantly poor in many OIC countries. The challenge now facing the high-burden OIC countries is how to achieve universal coverage of effective interventions including antenatal and postnatal care, safer deliveries, care for new-borns and infants, breastfeeding, micronutrient supplementation and routine immunization against preventable diseases while optimizing investments and enhancing accountability to improve the health and nutritional status of women and children.



In this respect, priority actions should include training of antenatal care providers; improving supplies and logistics for health facilities; strengthening the referral linkages between communities and hospitals providing emergency maternal and child care; investing for more and better trained and equipped health workers to reach the majority of children who today do not have access to basic health care; developing home-based maternal and new-born care programmes based on successful models of community health workers; educating families and communities in how best to bring up their children healthily and deal with sickness when it occurs; and making better use of data to monitor and improve child health care coverage and quality.

To improve the immunization coverage among children, priority actions for the governments and other stockholders should include formulation of innovative strategies to achieve high and equitable immunization coverage; development and use of new vaccines and technologies; synchronization of Vaccination Week within the OIC countries; fighting taboos against vaccination through the involvement of political and religious community leaders; and operationalizing the OIC Pooled Vaccine Procurement mechanism to secure timely supply and access to quality vaccines, particularly to new and underutilized ones, at competitive prices.

Governments should take necessary measures to improve the nutritional status of children by targeting the incidence of underweight, stunting, wasting and overweight among children. Provided the fact that health of mother is critical for the child, countries should develop and improve public health programs and services to provide education and resources to women of child bearing age to promote healthy nutrition prior to conception and during pregnancy, and provide assessments to at-risk pregnant women to help ensure that they receive appropriate medical attention. In addition, efforts should also be made to prevent women from becoming smokers and encouraging those who do smoke to quit. Academic and clinical research on major causes of malnutrition-related disorders is another area of paramount importance which needs due consideration of policy makers. In order to address the obesity, population-wide weight-control campaigns to raise awareness among medical staff, policymakers and the public at large to reduce obesity have been very effective. In addition, keeping a check on the marketing of unhealthy foods and sugary drinks to children, and controlling the use of misleading health and nutrition claims is also very important. In some countries, governments have also increased taxation on high-calorie, low-nutrition foods to reduce the consumption of such products.

Promotion of exclusive breastfeeding for 6 months and continued breastfeeding up to two years of age and beyond is critical for the nutritional status of babies. As recommended by the Global Strategy for Infant and Young Child Feeding (WHO, 2003), all mothers should have access to skilled support to initiate and sustain exclusive breastfeeding for 6 months and ensure the timely introduction of adequate and safe complementary foods with continued breastfeeding up to two years or beyond. To address the grievances of working mothers, governments should enact legislation protecting the breastfeeding rights of working women and establishing means for its enforcement in accordance with international labour standards. Furthermore, fortification of foods; micronutrient supplementation; and treatment of severe malnutrition are also important policy areas especially for the high burden countries. In this regard, OIC countries can benefit from the technical and financial support of international institutions and development partners



through initiatives like Scaling Up Nutrition Movement (SUN) which helps countries in developing and implementing national infant and young child feeding policies; collaborating with partners to implement programmes with shared nutrition goals; and mobilising resources to effectively scale up nutrition with a core focus on empowering women. Currently, 55 countries are part of this movement including 26 OIC countries.

Medicines, Vaccines and Medical Technologies

Pharmaceutical production requires skilled human resources like scientists, pharmacists, biologists and lab technicians. Therefore, OIC countries should encourage and empower their education system to impart quality knowledge in academic disciplines like Chemistry, Biology, Medicines and other natural sciences. On the other hand, OIC countries should also give due attention to convert the brain drain of high-skilled people into brain gain by facilitating the national Diaspora to return to their countries. Furthermore, pharmaceutical industry relies heavily on research and development (R&D) activities. Proper R&D facilities should be built, and researchers and technicians should be provided with necessary financial resources to develop an innovative pharmaceutical industry in the OIC economies. At the intra-OIC level, OIC countries should collaborate with each other by sharing expertise for the development of pharmaceutical industry. At the same time, students mainly from least developed member countries can be enrolled in pharmaceutical related academic disciplines in other OIC countries with substantial pharmaceutical base like Turkey, Egypt, Jordan and Malaysia to equip them with the necessary knowledge and expertise in this field. At the international level, OIC countries should collaborate with the international agencies like WHO and World Bank to benefit from their expertise and financial contribution to build their domestic pharmaceutical industry. OIC countries should work towards regional harmonization and simplification of regulatory requirements so as to increase access to good quality, safe and effective medicines.

Moreover, access to treatment is heavily dependent on the availability of affordable medicines. A regular supply of essential medicines in OIC countries is required to avoid medicine shortages that can cause avoidable suffering and death. Pharmaceutical companies in OIC countries could be encouraged to produce more affordable essential medicines locally. More precisely, support to the local manufacturers of medical products i.e. policies that reduce the cost of manufacture such as grants, subsidies, land, tax and duty exemptions for imported inputs for local production should be facilitated. OIC countries should support the development of technical specifications for medical devices in order to provide information for decision-makers about the minimum requirements needed for a device to be procured. They also need to develop national guidelines and policies in accordance with international norms and standards on the procurement and distribution of vaccines, medicines and medical devices in order to ensure the safety, efficacy, and quality across the distribution channels.

Emergency Risk Management for Health

Health, education and skills development are three critical areas where investment in human capital can make real difference in strengthening the resilience of people, reducing the likelihood of a crisis and recovering from a crisis situation. However, OIC countries are trailing behind the world averages in all these indicators, reflecting their vulnerability to crises. While accounting for



nearly a quarter of the world population, OIC countries accounts only for 4.6% of the global health spending. Therefore, there is a need to develop strategies and programmes to improve health and educational outcomes and capabilities of people in technical and practical knowledge.

The levels of exposure, vulnerability and coping capacity of OIC countries to various disasters and conflicts are quite heterogeneous. While some countries are quite advanced in managing risks associated with potential humanitarian crises, others require substantial improvement in capacities to reduce vulnerabilities and cope with the risks. This fact creates an opportunity for intra-OIC (or south-south) cooperation in building resilience in vulnerable OIC countries.

It is evident that several OIC countries face serious obstacles in strengthening their health system capacities due to ongoing conflicts or lack of adequate resources. OIC countries need to establish health emergency preparedness and response policies or enhance existing policies and programmes. A disaster management mechanism with an appropriate administrative structure is an essential component for the coordination of the response by the health sector and other stakeholders in the event of an emergency.

Comprehensive strategic plans based on international disaster risk management frameworks are critical to set out multi-sector guidelines, roles and responsibilities for the coordination of a rapid and effective response to an emergency. Effective management of humanitarian crises is, however, very much related to good institutions. For good governance and inclusive development, there is a need for developing and implementing inclusive development programmes and policies managed by strong national and local institutions.

Robust public health infrastructure is the foundation for a strong and rapid response during any emergency. Health facilities must be built and modified to withstand disasters. Hospital emergency preparedness and response plans must be developed and tested. Moreover, enough resources should be allocated for the establishment and functioning of national programmes and the capacity of health personnel for emergency response must be strengthened through regular trainings.

Information, Research, Education and Advocacy

The challenges related with the quality of health education and public awareness point out the necessity of reforms to upgrade the quality of health education in OIC countries. In this context, many OIC countries need to undergo a major reform process to have better health education and training systems. For the success of such reforms, cooperation with international community and organisations are crucial. The existing international guidelines (e.g. the WHO Guidelines and the OIC Strategic Health Programme of Action) can help OIC countries to save money and time during the reform process. Enhancing intra-OIC cooperation through identifying and transferring best practices in health education and training can also make a significant contribution to improve the quality of health services and education in OIC countries. The existence of heterogeneity and varying local conditions both across and within OIC countries require more evidence from the field and views from civil society organisations. Otherwise, reform attempts to improve the quality and scope of health education and services will become unsuccessful due to the negligence of many regional/local conditions and restrictions in many OIC countries.

Involvement and commitment of all stakeholders is also very crucial to initiate and implement effective community health information, education and advocacy programmes. To do so, OIC countries are recommended to organize conventions of local health care providers, community leaders and local people to make community health information and promotion interventions more culturally relevant and responsive; create public-private partnership and involve civil society, NGOs and international organizations to address the issues related with financing and outreach of national disease prevention and health promotion programmes; launch country wide school health program to promote awareness among youth especially about risk behaviours like inadequate physical activity, poor nutrition, hygiene and tobacco use etc.; and enhance intra-OIC level cooperation to harmonise health information, education, and advocacy practices with the international standards by implementing the guidelines provided by international health agencies.



ANNEX

Country Classifications

A. Major Country Groups used in the Report

OIC Countries (56+1)

Afghanistan	Egypt	Malaysia	Somalia
Albania	Gabon	Maldives	Sudan
Algeria	Gambia	Mali	Suriname
Azerbaijan	Guinea	Mauritania	(Syria)
Bahrain	Guinea-Bissau	Morocco	Tajikistan
Bangladesh	Guyana	Mozambique	Togo
Benin	Indonesia	Niger	Tunisia
Brunei	Iran	Nigeria	Turkey
Darussalam	Iraq	Oman	Turkmenistan
Burkina Faso	Jordan	Pakistan	Uganda
Cameroon	Kazakhstan	Palestine	United Arab
Chad	Kuwait	Qatar	Emirates
Comoros	Kyrgyz Republic	Saudi Arabia	Uzbekistan
Cote d'Ivoire	Lebanon	Senegal	Yemen
Djibouti	Libya	Sierra Leone	

Non-OIC Developing Countries (98)

Angola	Argentina	Barbados	Bhutan
Antigua and	Armenia	Belarus	Bolivia
Barbuda	Bahamas	Belize	



Bosnia and Herzegovina	Fiji	Mongolia	South Africa
Botswana	Georgia	Montenegro	South Sudan
Brazil	Ghana	Myanmar	Sri Lanka
Bulgaria	Grenada	Namibia	St. Kitts and Nevis
Burundi	Guatemala	Nauru	St. Lucia
Cabo Verde	Haiti	Nepal	St. Vincent and the Grenadines
Cambodia	Honduras	Nicaragua	Swaziland
Central African Rp.	Hungary	Palau	Tanzania
Chile	India	Panama	Thailand
China	Jamaica	Papua New Guinea	Timor-Leste
Colombia	Kenya	Paraguay	Tonga
Dem. Rep. of the Congo	Kiribati	Peru	Trinidad and Tobago
Rep. of Congo	Kosovo	Philippines	Tuvalu
Costa Rica	Lao P.D.R.	Poland	Ukraine
Croatia	Lesotho	Romania	Uruguay
Dominica	Liberia	Russia	Vanuatu
Dominican Rep.	FYR Macedonia	Rwanda	Venezuela
Ecuador	Madagascar	Samoa	Vietnam
El Salvador	Malawi	São Tomé and Príncipe	Zambia
Equatorial Guinea	Marshall Islands	Serbia	Zimbabwe
Eritrea	Mauritius	Seychelles	
Ethiopia	Mexico	Solomon Islands	
	Micronesia		
	Moldova		

Developed Countries* (39):

Australia	Germany	Lithuania	Singapore
Austria	Greece	Luxembourg	Slovak Rep.
Belgium	Hong Kong	Macao SAR	Slovenia
Canada	Iceland	Malta	Spain
Cyprus	Ireland	Netherlands	Sweden
Czech Rep.	Israel	New Zealand	Switzerland
Denmark	Italy	Norway	Taiwan
Estonia	Japan	Portugal	United Kingdom
Finland	Rep. of Korea	Puerto Rico	United States
France	Latvia	San Marino	

(* Based on the list of advanced countries classified by the IMF. Last update 22 April 2019.)



B. Geographical Classification of OIC Countries

(Based on World Bank Classification)

Sub-Saharan Africa (21): OIC-SSA

Benin	Gabon	Mozambique	Sudan
Burkina Faso	Gambia	Niger	Togo
Cameroon	Guinea	Nigeria	Uganda
Chad	Guinea-Bissau	Senegal	
Comoros	Mali	Sierra Leone	
Côte d'Ivoire	Mauritania	Somalia	

Middle East and North Africa (18+1): OIC-MENA

Algeria	Iran	Morocco	(Syria)
Bahrain	Jordan	Oman	Tunisia
Djibouti	Kuwait	Palestine	United Arab
Egypt	Lebanon	Qatar	Emirates
Iraq	Libya	Saudi Arabia	Yemen

East and South Asia and Latin America (9): OIC-ESALA

Afghanistan***	Brunei	Indonesia*	Pakistan***
Bangladesh***	Darussalam*	Malaysia*	Suriname**
	Guyana**	Maldives***	

ESALA is combination of countries in (*) East Asia and Pacific, (**) Latin America and Caribbean, and (***) South Asia.

Europe and Central Asia (8): OIC-ECA

Albania	Kazakhstan	Tajikistan	Turkmenistan
Azerbaijan	Kyrgyzstan	Turkey	Uzbekistan



REFERENCES

Abbott F., Dukes MNG, Dukes G., (2009). Global Pharmaceutical Policy: Ensuring Medicines for Tomorrow's World

Akl OA, El Mahalli AA, Elkahky AA, Salem AM (2014). WHO/INRUD Drug Use at Primary Healthcare Centers in Alexandria, Egypt. J Taibah Univ Med Sci 2014;9(1):54–64. 6.

Alcántara, H., (2001). The Development Divide in a Digital Age: An Issues Paper. No. 4, UNRISD, Geneva

APEC (2012), A Guide to Public Health Emergency Response Capacity Building, APEC Health Working Group, Asia Pacific Economic Cooperation, November 2012.

Appleton K., Sara L., and Kathleen A., (2009). Measuring Student Expectations and Their Effects on Satisfaction: The Importance of Managing Student Expectations.

Bayntun C, Rockenschaub G., Murray V. (2012). Developing a Health System Approach to Disaster Management: A

Qualitative Analysis of the Core Literature to Complement the WHO Toolkit for Assessing Health-System Capacity for Crisis Management,” PLOS Currents Disasters. Aug 22. Edition 1.

Benthall J. and J. Bellion-Jourdan (2003), The Charitable Crescent: Politics of Aid in the Muslim World, L.B. Tauris & Co. Ltd., London & New York.

Betancourt, J. R., Green, A. R., & Carrillo, J. E. (2002). Cultural competence in health care: Emerging frameworks and practical approaches. New York: The Commonwealth Fund.

Bhutaa, Z., et al., (2010). Education of Health Professionals for the 21st Century: A Global Independent Commission

Bowsher, G., Papamichail, A., El Achi, N., Ekzayez, A., Roberts, B., Sullivan, R., & Patel, P. (2019). A Narrative Review of Health Research Capacity Strengthening in Low and Middle-Income Countries:



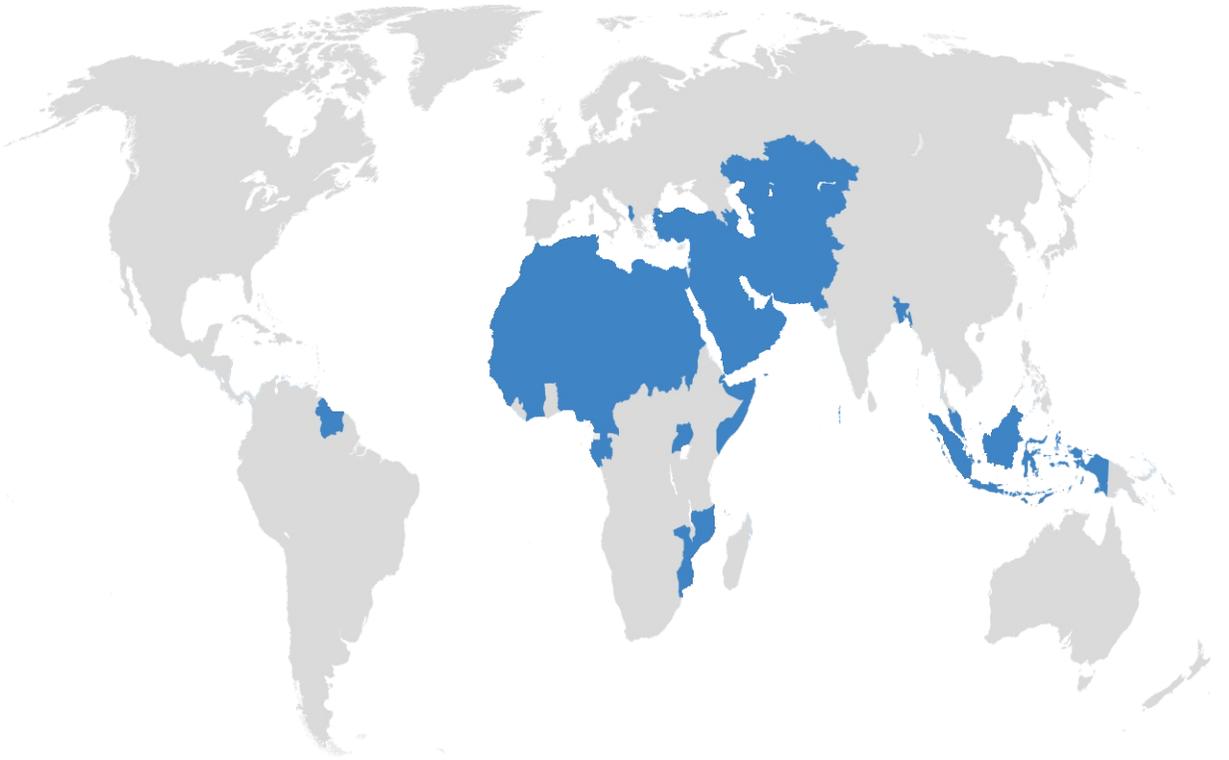
- Lessons for Conflict-Affected Areas. *Globalization and Health*, 15(1), 23.
- Calabretta, N. (2002). Consumer-driven, Patient-centered Health Care in the Age of Electronic Information, *Journal of Medical Library Association*, 90 (1):32-37.
- Chan, T. C., Killeen, J., Griswold, W., & Lenert, L. (2004). Information Technology and Emergency Medical Care during Disasters. *Academic Emergency Medicine*, 11(11), 1229-1236.
- Chen C, Buch E, Wassermann T, et al., (2012). A Survey of Sub-Saharan African Medical Schools. *Human Resources for Health*. 10(4).
- Clemens M., Pettersson G., (2008). New Data on African Health Professionals Abroad. *Human Resources for Health*.
- Elizabeth K., (2013). Ten Things Doctors Can Do to Reduce Their Medical Malpractice Exposure. *CoverMed*.
- Emergency Medical Services & Emergency Preparedness | HealthIT.gov. (2019). Retrieved 10 September 2019, from <https://www.healthit.gov/topic/health-it-health-care-settings/emergency-medical-services-emergency-preparedness>
- Emily B., (2013). Lack of Data Creates Concern over True Extent of Medical Errors. *ABC News, World Today*, updated 10 Jun 2013
- Estabrooks C.A., Wallin L., and Margaret Milner (2003). Measuring Knowledge Utilization in Health Care, *Evaluation & Management* 1(1) 3-36.
- EWEC (2015). The Global Strategy for Women's, Children's and Adolescents' Health (2016-2030), *Every Woman Every Child*
- Frenk, Julio., et al. (2010). Health Professionals for a New Century: Transforming Education to Strengthen Health Systems in an Interdependent World. *The Lancet* 376(9756): 1923-1958.
- Gold, Marthe R., (1996). *Cost-effectiveness in Health*, New York: Oxford University Press, 1996
- Hubley, J. (1988). Health Education in Developing Countries—the Need for an Appropriate Technology. *Health Education Research*, 3(4), 387-392.
- Humanosphere (2014). *Global Health, Eight Facts about Health Workers and the Brain Drain*
- IMS (2014/15). *Pharmerging Markets*, IMS Health, New Jersey.
- Institute of Medicine (2002). *The Future of the Public's Health in the 21st Century*, Washington: National Academy Press
- IQVIA (2019), *The Global Use of Medicine in 2019 and Outlook to 2023: Forecasts and Areas to Watch*, IQVIA Institute.
- Ishaq A., (2001). On the Global Digital Divide. *Finance & Development* 38(3)
- Kathleen, H., and Liset, V. D., (2011). *The World Medicines Situation 2011*. WHO, Geneva
- Kruk, M.E., M. Myers, S.T. Varpilah & B.T. Dahn (2015). What is a Resilient Health System? Lessons from Ebola, *Lancet* 2015; 385: 1910–12
- Książek P., et al. (2008). Health Education as an Essential Standard in Healthcare



- Prevention for Students in Education Environment in Lublin
- Lancet (2010). Health Professionals for a New Century: Transforming Education to Strengthen Health Systems in an Interdependent World.
- Management Sciences for Health (2012). MDS-3: Managing Access to Medicines and Health Technologies. Arlington, VA
- Neil P., and Frederick B., (2009). Information Needs of Health Care Workers in Developing Countries: A Literature Review with a Focus on Africa, Human Resources for Health
- Nickerson J. W., J.Hatcher-Roberts, O. Adams, A. Attaran and P. Tugwell (2015). Assessments of Health Services Availability in Humanitarian Emergencies: A Review of Assessments in Haiti and Sudan using a health systems approach, *Conflict and Health* (2015) 9:20
- Ontario (2016). Building a Ready and Resilient Health System, Ministry of Health and Long-Term Care, Ontario, Canada
- PAHO (2015). The Hospital Safety Index, Pan American Health Organization, available at: http://www.paho.org/disasters/index.php?option=com_content&view=article&id=964&Itemid=911
- Ritchey FJ., (2014). Medical Malpractice, The Wiley Blackwell Encyclopedia of Health, Illness, Behavior, and Society. New York: Wiley
- Sabaté E., (2003). Adherence to Long-term Therapies, Evidence for Action, WHO, Geneva
- SCRE (2004). Resistance: A Sensitive Issue, European Roadmap to Combat Antimicrobial Resistance, Strategic Council on Resistance in Europe
- SESRIC (2014). Education and Scientific Development in the OIC Member Countries 2014, SESRIC, Ankara
- SESRIC (2014a). Managing Disasters and Conflicts in OIC Countries, SESRIC, Ankara.
- SESRIC (2014b). OIC Strategic Health Programme of Action 2014-2023, SESRIC, Ankara.
- SESRIC (2015). OIC Health Report 2015. SESRIC, Ankara
- SESRIC (2017), OIC Health Report: 2017, Ankara.
- SESRIC (2017). Humanitarian Crises in OIC Countries: Drivers, Impacts, Current Challenges and Potential Remedies, SESRIC, Ankara.
- Siribaddana, P., Hewapathirana, R., Jayatileke, A. U., Sahay, S., & Dissanayake, V. H. (2019). Strengthening Health Systems through Informatics Capacity Development among Doctors in Low-Resource Contexts: The Sri Lankan Experience. *WHO South-East Asia journal of public health*, 8(2), 87.
- Swanson, R. C., Atun, R., Best, A., Betigeri, A., de Campos, F., Chunharas, S., & Omaswa, F. (2015). Strengthening Health Systems in Low-Income Countries by Enhancing Organizational Capacities and Improving Institutions. *Globalization and Health*, 11(1), 5.
- Tankwanchi ABS., Özden Ç, Vermund SH, (2013). Physician Emigration from Sub-



- Saharan Africa to the United States: Analysis of the 2011 AMA Physician Masterfile. PLoS Medicine.
- Tatar, M., Mollahaliloglu, S., Aydin, S., Maresso, A., Hernandez-Quevedo, C., (2011). Turkey Health System Review, WHO, Geneva
- UNICEF (2004). Vitamin and Mineral Deficiency, Global Progress Report, UNICEF, New York.
- UNICEF (2016). State of the World's Children Report 2016, United Nations Children's Fund, New York.
- WHO (2004). eHealth for Health-care Delivery: Strategy 2004-2007. WHO, Geneva
- WHO (2006). The World Health Report 2006: Working together for Health. WHO, Geneva
- WHO (2009). Medicines Use in Primary Care in Developing and Transitional Countries: Fact book summarizing results from studies reported between 1990 and 2006, WHO, Geneva
- WHO (2010). World Health Report: Health Systems Financing: The Path to Universal Coverage, WHO, Geneva.
- WHO (2011). The World Medicine Situation, WHO, Geneva.
- WHO (2012), Toolkit for Assessing Health System Capacity for Crisis Management, User Manual, WHO Regional Office for Europe, Copenhagen.
- WHO (2012). Local Production and Technology Transfer to Increase Access to Medical Devices, WHO, Geneva.
- WHO (2013), Global Vaccine Market Features and Trends, WHO, Geneva.
- WHO (2013b). Emergency Response Framework, WHO, Geneva.
- WHO (2013c). Transforming and Scaling up Health Professionals' Education and Training, WHO, Geneva.
- WHO (2014). Universal Health Coverage (UHC), Fact Sheet No.395 September 2014, WHO, Geneva.
- WHO (2015a), Hospital Safety Index Guide for Evaluators, Second Edition, WHO, Geneva.
- WHO (2015b), Comprehensive Safe Hospitals Framework, WHO, Geneva.
- WHO (2017). Health Workforce, Education and Training, <http://www.who.int/hrh/education/en/>
- WHO (2017a), A Strategic Framework for Emergency Preparedness, WHO, Geneva
- WHO (2017b). Humanitarian Response Plans in 2017, Department for Emergency Risk Management and Humanitarian Response, WHO, Geneva
- WHO (2019), Progress report on HIV, Viral Hepatitis and Sexually Transmitted Infections, Geneva.
- WHO. (1991). *Health Promotion in Developing Countries*. Geneva: The Sundsvall Conference on Supportive Environments.



STATISTICAL, ECONOMIC AND SOCIAL RESEARCH
AND TRAINING CENTRE FOR ISLAMIC COUNTRIES

Kudüs Cad. No:9 Diplomatik Site 06450 ORAN-Ankara, Turkey
Tel: (90-312) 468 61 72-76 Fax: (90-312) 468 57 26
Email: oicankara@sesric.org Web: www.sesric.org