
بسم الله الرحمن الرحيم

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Federation of Islamic Medical Associations
الاتحاد العالمي للجمعيات الطبية الإسلامية

HEALTH IN THE MUSLIM WORLD:
MEETING THE MILLENNIUM DEVELOPMENT GOALS

الصحة في العالم الإسلامي:
نحو تحقيق أهداف التنمية الألفية

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EDITORIAL

Dear FIMA members
Assalamu Alaykum
Bismillah al-Rahman al-Rahim

Praise be to Allah the Most Merciful, the Most Beneficent. May Allah ? shower His blessings and peace on the Prophet and Messenger Muhammad ? .

I begin by thanking the FIMA Executive Committee for honoring me with the responsibility of being the Editor-in-Chief again for this year's yearbook. I thank Allah ? for giving me this opportunity and enabling me to accomplish this task. I pray to Allah ? to accept my effort in His way and to reward all who participated in this effort.

This year, our theme is "Health in the Muslim World: Meeting the Millennium Development Goals." The United Nations Millennium Summit in September 2000 adopted the Millennium Declaration that delineated eight Millennium Development Goals (MDGs). Three of these goals are directly related to health although the others also have a definite impact on health. The three MDG goals specific to health are MDG 4 to reduce under-five mortality by two-thirds, MDG-5 to improve women's health by reducing maternal deaths by 75% and ensuring access to reproductive health, and MDG-6 to combat HIV/AIDS, malaria and other diseases. The target year for achieving these goals is 2015, with 1990 being the baseline. MDG 7 is to ensure environmental sustainability. It is closely related to health, though indirectly. These goals are genuine Islamic goals, and we as a Muslim nation should be pioneers in their implementation. The different authors of this yearbook addressed each of these MDGs.

Dr. Bin Abdel Rahman discussed the progress made by the Muslim countries towards achieving these goals. He noted that many of them did not make enough progress as these goals proved to be a daunting task to many of the developing and relatively resource-poor Muslim countries. He notes that more than a quarter of the world's 2.3 billion children live in Muslim countries. It is true that under-five mortality dropped across all Muslim nations from 126/1000 live births in 1990 to

82/1000 live births in 2010. However, substantial differences exist among these countries. It is 7/1000 in the United Arab Emirates compared to 180/1000 in Somalia. He stressed that all that is needed to further reduce this mortality is the introduction of basic elements of public health such as immunization, access to safe drinking water, sanitation facilities, good nutrition and improved maternity care. At present, only 77% of people in Muslim countries have access to safe drinking water, and only 55% use adequate sanitation facilities.
Achieving MDG-5 is also challenging. The global rate of maternal death is 1 in 74. In Afghanistan 1 in 6 pregnancies ends in death. The situation is not that bleak in all Muslim countries. Significant improvement that is 80% reduction in maternal mortality occurred in Maldives and Iran. On the other hand several Muslim countries made no progress at all or are not on track to achieve the 75% reduction by 2015 such as Chad and Somalia.

Dr. Abdel Rahman reported that significant progress has occurred in Malaysia. The under-5 mortality has been reduced from 16.8/1000 in 1990 to 8.5/1000 live births in 2010. The Maternal Mortality Ratio, i.e. maternal deaths both direct and indirect per 100,000 live births declined from 44 to 27.3 in 2010. He attributed this progress to political stability, strong political will, commitment by healthcare providers and policy makers. MDG-6 calls for the "halting and reversing of transmission of HIV". New HIV infections have decreased from 28.5 to 12.2 per 100,000 persons in 2011. Dr. Abdel Rahman also reported that the incidence of AIDS has decreased. He attributed this decrease to premarital screening, prevention of maternal to child transmission programs, needle exchange programs, and methadone maintenance therapy. Furthermore, the provision and access to anti-retroviral treatment and its cost reduction resulted in first line treatment becoming accessible to all patients at no charge. He further reported that, in Malaysia, the incidence of malaria has decreased from 29 to 2.5/10,000 from 1990 to 2009. He stated that Malaysia is actually expected to eradicate malaria completely by 2020 ahead of the MDG targeted date.
Dr. Abdel Rahman reported that tuberculosis kills 600,000 and infects 2.7 million people each year. Afghanistan and Pakistan are amongst the world's 22 countries with the highest burden.There was an increase in the number of cases of TB in Malaysia as in other parts of the world over the past few years. The Malaysian Ministry of Health developed a 5-year National Strategic Plan (2010-2015) for tuberculosis control to achieve MDG-6 target.

Dr. Zubairi addresses the health challenges of the Muslim world. He points out

that Muslims who make up 23.8% of world population produced only 8% of the global economic output in 2011. Twenty two of MMCs are among the least developed countries. Wars, political instability, violence and natural disasters have further degraded their socio-economic status and severely compromised their programs.

MMCs are below the world standard in the Human Development Index (HDI) which includes multiple parameters relating to education, health and nutritional status. Multinational pharmaceutical companies neglect tropical diseases because of low profitability. They put their research dollars into finding cure of diseases of affluence and those related to increased longevity such as heart disease, cancer or Alzheimer's disease rather than diseases of the poor and that includes tropical diseases. Less than 1% of the new medications brought to market during the last few years are for tropical diseases. The developing MMCs bear 90% of the disease burden but allocate less than 10% of their annual budget to healthcare. Even with the meager budgets, most of the allocation is toward curative rather than preventative health services such as improving sanitation, purifying drinking water, and waste disposal or for promoting positive behavioral factors such as personal hygiene, moral sexual behavior, cessation of smoking and avoidance of drugs and alcohol.

Another challenge in many MMCs is the large number of emigrants, especially of the highly skilled medical professionals, to Western countries (brain drain). Of those remaining, many do not join the public health sector but rather practice in the affluent sections of the country leaving large swathes of their countries with no qualified healthcare providers.

Dr. Andriana noted that women in developing countries face 15 times the risk of maternal death as those in developed countries. This increase is attributable in part at least to the fact that women – including in Muslim majority countries (MMCs) – are treated as second-class citizens. She quotes Dr. Fathallah, a previous president of the International Federation of Gynecologists and Obstetricians (FIGO), "Women are not dying because of a disease we cannot treat. They are dying because societies have yet to make the decision that their lives are worth saving." This is particularly disheartening as in Islam motherhood is given a very high value. In Islam, women are equal in worth to men.
Dr. Andriana states that the high maternal mortality can be described on the basis of a 3 delay model. The first is the decision to seek medical, specifically,

antenatal care. This is due to the lack of understanding of potential pregnancy complications, acceptance of maternal death as a fact of life, low status of women and socio-cultural barriers to seeking care. The second delay is reaching care secondary to poor infrastructure, specifically the lack of safe and affordable transportation to health care facilities. The third delay is receiving care due to lack of properly trained personnel and lack of affordable healthcare providers / facilities. Dr. Andriana reminds us of the poor socio-economic conditions and how it adversely impacts healthcare in the MMCs. Forty four percent of the 48 MMCs are in the United Nations low income countries where the Gross National Income per capita is 905 or less USD. Not surprisingly the under-5 mortality and MMR are almost twice as high in those countries. Another factor which plays a role is the high illiteracy rate. There is 4-fold higher infant mortality rate in infants born to illiterate mothers than those born to mothers who had secondary education. The poor sanitary conditions are key determinants of poor health indicators in MMCs resulting in the still higher incidence of communicable diseases. For example the leading cause of death in low income countries is lower respiratory tract infections while it is the 4th leading cause in high income countries.Dr. Andriana notes that in most countries life expectancy of women is longer than that of men but in MMC unequal access to information, care, and basic health practices increase health risks to women. This needs to be rectified.

A significant percentage of under-5 children mortality is attributable to communicable diseases. The sad part of this is that most of these deaths are attributable to diseases for which potent vaccines are available and as such these deaths are preventable. Dr Alwan addresses this aspect specifically in the Eastern

Mediterranean Region (EMR) of the World Health Organization. He reports that this percentage is 20% of these deaths. The good news is that there has been significant increase in routine vaccination coverage in the different countries of the region. Also newer vaccines; Hemophilus Infleunza Type B (Hib), pneumococcal conjugate vaccine (PCV), and rotavirus vaccine have been introduced in some countries. The region achieved 93% reduction in measles mortality between 2000-2008. The bad news is that the target elimination date of measles was 2010 but had to be postponed to 2015, and that there are still 3 million infants who did not receive the third dose of DTP vaccine in 2012.

Dr Alwan states that MDG 4 cannot be achieved by only scaling up classic vaccine coverage. However, increasing the coverage to at least 90% and the wide use of the new vaccines; Hib, PCV, and rotavirus vaccine would result in 60-70% reduction in under- 5 mortalty attributable to vaccine preventable diseases by 2015.

Dr Nordin continues the discussion of the status of vaccination in Muslim countries specifically in relation to rotavirus and poliomyelitis.
Globally, rotavirus gastroenteritis kills 527,000 children less than 5 years old and is responsible for millions of hospitalizations and clinic visits every year. Ninety five per cent of rotavirus deaths occur in developing countries in Africa and Asia. Poor sanitation, insufficient water treatment, and lack of access to appropriate medical care and life saving vaccines, are responsible for these deaths. During the manufacture process of the two available vaccines trace amounts of porcine trypsin are used. This has triggered concern in some Muslim circles. However, through microfiltration the trypsin is completely removed from the end product. This, in addition to the fatwa regarding the use of OPV should remove any doubt about the permissibility of the use of the rotavirus vaccines. Dr. Nordin strongly recommends the universal use of these vaccines. He reports that each day > 1,200 children under five years die of rotavirus gastroenteritis, deaths that can be averted by the use of the vaccine. Pakistan and Nigeria were 2 of the 5 countries which together contributed up to a half of the global rotavirus diarrheal deaths in 2008.

Dr. Nordin also discusses the Global Polio Eradication Initiative (GPEI) that was launched by the World Health Assembly in 1988.Within 15 years polio had been eliminated from all but 6 countries, and fewer than 1000 children have been paralyzed by polio in 2003. In 1994, WHO region of the Americas was certified polio free, followed by WHO Western Pacific region in 2000, and WHO European region in 2002. As of May 3013 there were only 26 cases of wild poliovirus cases and only three polio endemic countries: Nigeria, Pakistan and Afghanistan.
The significant drop in polio infection is due to the widespread use of the Sabin vaccine (OPV) which is a live attenuated oral vaccine. However, after the almost complete eradication of the wild polio virus, the widespread use of OPV resulted in the emergence of the circulating vaccine derived polio virus (cVDPVs) that can cause vaccine associated paralytic polio (VAPP). Therefore this vaccine has been replaced almost completely in developed countries by the Salk vaccine which is inactivated virus vaccine (IPV) and later by the enhanced IPV (eIPV). Both these vaccines are not associated with VAPP. The continued use of OPV would compromise the goal of polio free world. Between 2000 and 2011 there were 20 cVDPV outbreaks resulting in 580 polio cases. It is estimated that there will be 250-500 cases of VAPP per year and up to one polio outbreak due to a cVDPV per year. The current GPEI strategic plan includes coordinated cessation of OPV and a phased replacement of OPV with IPV.

Unfortunately, the remaining endemic countries are Muslim countries. The persistence of polio in these countries is primarily due to under utilization of the vaccine. In Nigeria, Pakistan, and Afghanistan rumors and misinformation regarding OPV were preached in the name of Islam.OPV was alleged to contain unsafe substances that can cause infertility. It was also alleged that OPV was made of haram constituents (porcine trypsin).The European Council of Fatwa and Research issued a fatwa (religious opinion) in 2003 that it is not haram to use the vaccine and strongly recommended its use.

FIMA endorsed the GPEI and issued its "Cairo Declaration for Polio Eradication" in February 2013. FIMA also joined the fraternity of scientists and technical experts from 80 countries to launch the "Scientific Declaration on Polio Eradication" on April 11, 2013.

MDG 6 includes combat of malaria. Dr. El Bashir addresses this issue. It remains a leading cause of morbidity and mortality in large areas of the world. In the last decade of the twentieth century there were 300-500 million clinical cases and approximately one million deaths occurring yearly. Malaria is endemic in more than 100 countries, and almost half of them are in the Islamic World.
Dr. Elbashir stresses that it is a preventable and treatable disease provided that currently recommended interventions are properly implemented in all affected regions. These include 1) vector (mosquitos) control through the use of insecticide treated nets (ITNs), indoor residual spray (IRS) and in some cases larval control. 2) Chemoprevention 3) confirmation of the diagnosis and appropriate treatment. He discusses in detail the pathology, diagnosis and treatment with special emphasis on the problem of drug resistance and the recommendation for combination therapy to combat the resistant strains of the malaria parasite.

Major international efforts are now directed towards malaria control. The Roll Back Malaria (RBM) initiative was launched in 1998. Its ambitious goal was halving the burden of malaria from 2000 levels by 2010 and again by 2015. Emphasis is placed on malaria control (not eradication). Its main focus is in sub-Saharan Africa. It is a global partnership effort between developmental agencies, banks, private sector, foundations, and a network of scientists. Dr. El Bashir noted that unfortunately funding of these efforts is insufficient. While it is estimated that five billion USD are needed yearly, only 2 billion USD were actually provided in 2011. Reductions of > 50% in reported malaria cases between 2000 and 2010 in 43

of 99 countries and 25-50% reduction in 8 other countries is encouraging.
The real significant advance in the control of malaria will be the production and use of safe and effective vaccines. The complex life cycle of the parasite in the human host results in the expression of different genes on the surface of the infected red blood cells with significant polymorphisms sometime in a single gene adding to the difficulty of producing a vaccine. Thirty four candidate vaccines have been developed in the last 5 years, many of which are in clinical trials at present. Currently there is an ongoing field trial in 11 sites in 7 African countries of RLTSS vaccine. Preliminary results show 55% efficiency in different age groups. Most tested vaccines stimulate antibody response, whereas this vaccine stimulates T cell production against the malaria parasite. There is hope that a successful vaccine will be available by 2015.

Unfortunately, HIV/AIDS continues to be an international dilemma. The joint United Nations program on HIV/AIDS (UNAIDS) estimates that globally in 2011 there were 34.2 million people living with HIV (PLWA) compared to 3.2 million in 2001 and 1.7 million people died of AIDS. In sub-Saharan Africa where HIV/AIDS is more prevalent than the rest of the world, 61% of PLWA were women. Dr. Kagimu reports that in Uganda new infections continued to rise annually from 84,000 in 1994 to 130,000 in 2011. It is the most common cause of death among 20-45 year olds. Professor Kagimu opines that biomedical interventions are not enough to prevent HIV infection. He showed that religiosity is a potential solution that has been under utilized. In studies, performed under his direction, it was found that the youth who have higher levels of religiosity, whether Christians or Muslims, had lower HIV infection rates. Promoting religiosity as part of programs for reducing HIV infection is recommended. It requires continuous reminders to the religious leaders to promote religiously ordained moral edicts. It also requires education sessions including family members and friends.

The positive influence of Islamic culture and values has also been discussed by Dr. Qudah and Dr. Mishal. It is known that the prevalence of HIV/AIDS and other sexually transmitted diseases (STDs) is generally lower in Muslim countries than in other regions of the world. However, these authors noted that this generated an attitude of false security that Muslim societies are not susceptible to the HIV epidemic. The authors point out that many youth are engaged in lifestyles that will inevitably lead them to contract such infections. In fact, the 2012 UNAIDS data show a 35% increase in new infections in the Middle East and North Africa

between 2001 and 2011. There was more than a 25% increase in Bangladesh, Indonesia and many other MMCs. This occurred despite a significant decrease in other parts of the world.

FIMA has developed several programs to control this increase in infection rates. The Islamic approach to HIV/AIDS has been launched in Uganda by Dr. Kagimu. It consists of promoting the Islamic teachings that promote sound ethical lifestyle, acquiring scientific knowledge and forming partnerships and collaborative relationships with other religious and community leaders.

In South Africa, the Muslim AIDS Program Care Center was established in July of 2003. The IMA of Malaysia established homes for women and children living with HIV/AIDS. In the Middle East and North Africa, Dr. Qudah launched "Youth Protection from HIV/AIDS and STDs" in January 2006. This program so far has trained more than 10,000 male and female community leaders in more than forty nationalities. These leaders delivered more than 250,000 lectures, seminars and media presentations in youth centers, mosques, schools, universities and other community settings. These programs are meant to complement the Western programs by adding the Islamic paradigm based on holistic Islamic teachings. HIV/AIDS is looked upon as a manifestation of serious breakdown of socio-moral and behavioral standards, not merely as a viral infection. The Islamic approach adds the promotion of chastity, sexual fidelity and creation of drug-free societies.One of the success stories in regards to HIV control is in Malaysia as reported by Dr. Abdel Rahman earlier.

WHO defines environmental health as "the aspects of health and disease that are determined by the environment". Contemporary lifestyle, industrial development and economic growth had a significant toll on environment that ultimately impacts directly and indirectly on human health. It is thus not surprising that MDG 7 addresses the issue of environmental sustainability. Dr. Daoud writes on this subject in this yearbook. He points out that the Islamic guidance provides sound principles of environmental health. Muslims are urged to lead a balanced life avoiding waste, preserving nature, and safeguarding plants and animals that are described in the Glorious Quran as "nations" like us that have a vital role in maintaining the ecosystem. Dr. Daoud discusses in detail global warming and its effects specifically on sea levels and the "drowning" of lands that are at or slightly above sea levels at present. He also reminds us of the association between extreme heat waves and increased mortality especially in the elders. He also

discusses the catastrophic effects of drought and floods and their effects on spread of disease. Climate change also affects the migratory behavior of birds and animals. Global warming may also have deleterious effect on agriculture with possible decrease in food production.

Air pollution has a major effect on the incidence of respiratory and allergic diseases. Its main sources are autos' emissions and industrial waste which also causes water pollution. Air pollution is in part caused by emission from domestic fires burning biomass fuels primarily in developing countries.

While there is strong scientific evidence for global warming, there is still dispute about whether it is a normal part of cyclic changes or it is human made because of the excessive use of unclean energy such as oil, gas and coal leading to higher rates of emission of greenhouse gases. The UN tried to formulate certain regulations for the different countries by which to reduce their output of the greenhouse gases. These regulations were incorporated in the Kyoto Protocol, the Copenhagen Accord and recently the Cancun Treaty. Unfortunately these have not been ratified by some of the countries which are the main producers of these gases such as USA as it considers it to adversely affect its economic growth disproportionately compared to that of the developing countries. This is a serious problem. There is an urgent need to strike a sound balance between economic development and the environment. If the current trend continues, Dr. Daoud warns that the earth might not be inhabitable for future generations.

Islamic countries have to get involved, participate in the studies and formulating policies guided by the basic Islamic principles of removing harm and avoidance of over indulgence.

Dr. Abdul Rashid discusses the epidemiology of cardiovascular (CV) diseases in the world and specifically in the Muslim World. He cites the example of Malaysia which is unique among developing countries in that it conducts 10-year surveys of CV risk factors. The prevalence of all the major factors increased except smoking, which dropped slightly from 25% in 1996 to 22% in 2006. Diabetes increased by 80%, obesity by 62% and hypertension by 29% during the same period.

Malaysia is one of the few Muslim countries that launched a national action plan to curtail non-communicable diseases (NCDs). Dr. Abdul Rashid stresses that preservation of health / life is an integral part of Islamic teachings. It is second

only to preservation of religion in Maqasid al-Shariah. He recommends research on the role of spirituality in prevention of CV diseases and the adoption of an "Islamic intervention program" based on the Islamic teachings as detailed in Dr. Mishal's article. Societies and governments need to make proven interventions affordable to the public both in the public and private sectors.

Dr. Yusoff and Dr. Misha'l emphasize the role of diabetes in CV diseases. Diabetics have, in general, higher mortality rates and suffer higher complication rates associated with CV diseases than non-diabetics. They note that there is a significant increase in its prevalence in both developed and even more so in developing countries. Dr. Yusoff and his team started an ongoing prospective study of the prevalence of diabetes in 11 urban and rural sites in Peninsular Malaysia. The 12,455 adults (>30 years) participating in the study will be followed annually for 15 years. Fifteen per cent were found to be diabetics. They often have other CV risk factors such as dyslipidemia, hypertension and obesity. He recommends that FIMA organizes a similar multinational program in its component Muslim countries. Few diabetics get proper treatment to achieve adequate control. Furthermore, proven effective secondary prevention medications that treat associated complications are underutilized. Dr. Yusoff describes a therapeutic lethargy among the healthcare providers in the treatment of diabetes.

Dr. Misha'l addresses cardiovascular (CV) risk factors. Worldwide, 80% of cardiovascular deaths occur in low and middle income countries. Most of these deaths are attributable to modifiable risk factors: hypertension, dyslipidemia, obesity, diabetes, smoking, and sedentary life styles. Limited access to medical care is a factor in the lack of effective control of these risk factors. The prevalence of these factors is on the rise in developing countries including those in North Africa and the Middle East more so than in the Western countries. This is especially the case among younger age groups. There was a significant increase in Body Mass Index (BMI) in North Africa and the Middle East between 1980 and 2008 attributable to the increasing consumption of Western style fast food with high saturated fat content. The prevalence of diabetes is also increasing.For example in Jordan, approximately 30% of individuals aged >25 years have overt or prediabetes. All these risk factors are modifiable by education and life style interventions. Many of these positive interventions are embedded in our Islamic teachings. Dr. Mishal cites many Quranic verses and prophetic sayings that deal with proper diet and physical activities.

In summary one can say that many Muslim countries have made substantial progress on some of the MDGs but not all. Some other Muslim countries face substantial challenges in achieving them. Relatively poor economic development, increased political unrest, and armed conflicts have all hindered progress in many Muslim countries. Several natural disasters befell some countries and further slowed the achievement of these goals. Let us hope and pray that Allah ? bless our countries with peace and security and that Muslim communities and governments rise to their responsibilities, focus their attention on these goals, and make the appropriate plans to achieve them. May they in the next 2 years make enough progress to reach at least some of the targets of the MDGs.

I conclude by thanking all the authors for their contributions to the issue. I especially thank members of the Editorial Board: Drs. Aly Mishal, Abul Fadl Mohsin Ibrahim, and Musa Nordin for their valuable input and guidance. I sincerely appreciate the work of Dr. Mishal's staff for copyediting and proofreading of the manuscripts especially Ms. Elham Mohammad Swaid.

I pray that Allah ? accept and bless our efforts in His service. May Allah ? guide us to the right path and have mercy on us. Amin.

Wassalam

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FEDERATION OF ISLAMIC MEDICAL ASSOCIATIONS (FIMA) IN BRIEF

Established at the outset of the 15th Hijrah century, December 1981, in Orlando, Florida, USA, where senior leading medical professionals representing ten Islamic medical organizations, from various parts of the world, convened and laid down the foundation of the Federation.

Subsequently, in March 1999, FIMA was incorporated in the State of Illinois as a non-profit organization, then acquired the special consultative status with the United Nations Economic and Social Council (UN-ECOSOC).

Since that time, FIMA membership progressively expanded to include 27 full members, 17 associate members, and more than 15 prospective and collaborating organizations from all over the world.

Most FIMA activities and achievements are based on the endeavors of its member Islamic Medical Associations, in constructive mutual cooperation, and harmonious understanding.

Islamic medical activities of FIMA have a holistic nature. Leadership, mutual cooperation and innovation are prerequisites for the welfare of our communities, our Ummah and humanity at large.

These activities include, but are not limited to:

1. Cooperation in humanitarian medical relief work, where and when needed in disaster stricken countries. The FIMA Save Vision Program was initiated in early 2005. To date more than 90,000 eye surgeries, performed by volunteer ophthalmologists and teams from IMAs in several countries, in Africa, South and Southeast Asia, where visual impairments are rampant. The program included training of local medical professionals to continue and widen this activity by qualified local talents. The program also included establishment of eye hospitals in deprived communities.

   This activity qualified FIMA for a distinguished award from the American College of Physicians (ACP), designated for outstanding humanitarian achievements.

   Over the past two years, two new humanitarian activities were launched: The cleft lip/palate, and the vesico-vaginal fistula projects, both

highlighted as significant medical and psychosocial problems in several needy communities.

2. Scientific, professional and ethical jurisprudence related conferences, seminars and publications.
3. Establishment of the Consortium of Islamic Medical Colleges (CIMCO), to foster cooperation in improvement of curriculum, training, research, administration, and up-bringing of model medical practitioners.
4. Establishment of the Islamic Hospitals Consortium (IHC), to pursue cooperation and coordination among medical professionals and hospital administrators in areas of experience exchange, benchmarking, improvement of health care delivery, ethical, administrative and operational activities, to meet the most advanced international standards, in the context of Islamic principles.
5. Publication of FIMA Year Books, which address biomedical, ethical, scientific and other issues that are needed for medical practitioners, educators as well as Jurists.
6. Medical students activities, including conferences, seminars, publications, camps, Umrah and Ziarah programs.
7. Collaboration to extend a helping hand to Muslim medical practitioners in underprivileged countries, to work together and organize professional medical societies.
8. Establishment of resource centers. The HIV/AIDS Resource Center has been functional in prophylactic, social and therapeutic activities in several countries for the past two decades. The Biomedical Ethics Resource Center has been functional for the past decade. Action in preparing a comprehensive Encyclopedia of Bioethics and Medical Jurisprudence is underway.

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HEALTH IN THE MUSLIM WORLD: MEETING THE MILLENNIUM DEVELOPMENT GOALS

YBHG. Dato Sri' Dr. Hasan Bin Abdul Rahman
Director General of Health-Malaysia*

Distinguished participants, Ladies and Gentlemen,

1. INTRODUCTION

It is indeed a great pleasure to have been invited to deliver the keynote address in this prestigious FIMA 2012 conference. Let me start by welcoming all of you to Malaysia, a special welcome to those who are visiting Malaysia for the first time and to those who have been here before, welcome again.

Health is considered in Islam as a **blessing** given by God to human beings. The Prophet (PBUH) said, "There are two blessings which manypeople do not appreciate: health and leisure time." It is a human'sresponsibility to preserve the blessing of health.

At the United Nations Millennium Summit in September 2000, 189 world leaders adopted the Millennium Declaration which was translated into a set of 8 Millennium Development Goals - best known by the acronym MDGs.

These goals, with targets and indicators, have special relevance to population, development and health and have become important tools of monitoring human progress. The target year for achieving all MDGs has been set for 2015, with 1990 being the baseline. The 8 MDGs are:

MDG 1 - eradicate extreme poverty and hunger
MDG 2 - achieve universal primary education
MDG 3 - promote gender equality
MDG 4 - reduce child mortality
MDG 5 - improve maternal health
MDG 6 - combat HIV and AIDS, Malaria and other diseases
MDG 7 - ensure environmental sustainability
MDG 8 - develop a global partnership for development

The Muslim countries have committed to achieving the above MDGs. Of these 8 goals, MDG 4, 5 and 6 are specifically related to

***Keynote address:**

On September 14,2012, the Federation of Islamic Medical Associations (FIMA) held the 5th International Scientific Conference in Kuala Lumpur- Malaysia, in conjunction with the Islamic Medical Association of Malaysia (IMAM), under the above Theme.
The Editorial Board is pleased to publish this keynote address as presented.

health. Nevertheless, the health sector does have a stake in the other MDG goals, MDG 1, MDG 7 and MDG 8.

We take a pause here, today, to collectively review the health status of the Muslim countries in general, ranging from oil rich Saudi Arabia and Kuwait to Somalia and Afghanistan and the achievements in implementing the MDGs as well as deliberate over the many difficulties faced by the Muslim nations.

Muslims form one of the biggest religious groups in the world with an estimated population of over 1.8 billion. They are scattered over 57 countries, encompass many hundreds of cultures stretching across continents but the majority are in North Africa, Sub-Saharan Africa, the Middle East, Central Asia, South Asia and South East Asia.

2. THE GLOBAL SITUATION

Achieving the MDGs holds the promise of saving millions of lives; addressing the scourge of illiteracy, hunger and malnutrition; and ensuring good health to lead productive lives. However, achieving Health MDGs 4, 5 and 6 may appear a daunting task to many developing and relatively resource-poor Muslim nations. The current stark disparity especially the high maternal and child mortality ratio is unacceptable, and this needs to be addressed urgently.

The goal of MDG 4 calls for a reduction in under-five mortality ratio by two thirds by 2015. More than one quarter of the world's 2.3 billion children live in Muslim countries. Although under-five mortality has declined across these nations from 126 per 1,000 live births in 1990 to 82 in 2010, substantial differences exist among the regions. One in 12 children in Muslim countries die before their fifth birthday compared to one in 16 children in developing countries and one in 18 children in the world. Under-five mortality ratio in Muslim countries ranges from a low of 7 per 1,000 live births in the United Arab Emirates to 180 in Somalia.

In relation to MDG 1, about 6 million children under five suffer from malnutrition in the form of stunting, with low height for their age. Nearly half of the under five children in Afghanistan, Bangladesh and Yemen are underweight and stunted. A child born in the sub-Saharan Africa can expect to live only 46 years, compared to 78 in industrialized countries. It is sad to note that many of the causes of early childhood deaths are preventable. All that is needed is the introduction of basic elements of public health interventions, such as immunization, access to safe drinking water and sanitation facilities, good nutrition and improved maternal health during pregnancy and appropriate care during childbirth.

The focus on improving maternal health in MDG 5 is through reduction

in maternal mortality and ensuring access to reproductive health. In many Muslim countries, high fertility and lack of access to skilled medical care contributed to some of the highest maternal deaths. In Afghanistan, one in six pregnancies results in death; in the African sub-regions, the average is one death for every 15 pregnancies. Globally, the average is one in 74. Some reasons for high maternal mortality include low average age of marriage, illiteracy, lack of prenatal care, and obstetric complications. The 2010 the World Health Organization (WHO) estimates for maternal mortality, showed Maldives and Iran had done extremely well as they reduced their maternal mortality ratio (MMR) by more than 80 percent based on their 1990 data. These countries should serve as an example to other Muslim countries. Sadly, several Muslim nations in Africa like Cameroon, Chad, Djibouti, Gabon, Guinea-Bissau, Sierra Leone and Somalia have made no progress or are not on track to achieve MDG 5 by 2015. Maternal mortality is so intertwined with other 'social and economical factors' – including status of women, that a comprehensive holistic approach is required.

MDG 6 calls for "*halting and reversing*" the transmission of HIV/AIDS and other major diseases such as Tuberculosis and Malaria. According to UNAIDS there are an estimated 380,000 people (adult and children) living with HIV in North Africa and the Middle East. HIV prevalence is already relatively high in many African and Asian countries with large Muslim populations. Iran and Bangladesh has been relatively proactive in addressing the problem and seeking to control it. Other countries meanwhile have been much slower in their response or have tended to point to social and religious values to be of sufficient protection. In recent years, leaders in Malaysia and Saudi Arabia have begun to openly face the HIV/AIDS problem in their nations. Some have made pre-marriage HIV testing mandatory on potential couples. A simple test can save much suffering and lives. Islam in fact encourages one to value their bodies and lives and to take precautions and measures that prevent harm. In one of the Islamic traditions, it is stated that prophet Dawud (David) said, "Health is a hidden kingdom". A healthy body is a gift from Allah and we are not to abuse it but to take care of it as it is a trust from Allah. We should avoid any act which will cause harm to our bodies both physically and spiritually.

Another alarming disease that deserves our attention is that of Tuberculosis (TB). Between now and 2015, up to 3 million people will die of TB in Muslim countries. Each year TB kills 600,000 people in these countries and infects 2.7 million. Afghanistan and Pakistan have a very high number of TB patients and are among the world's 22 countries with the highest burden of disease.

Around 77 percent of people in

Muslim countries have access to safe drinking water. However, only 55 percent use adequate sanitation facilities. Several Muslim countries are on track to meet the MDGs on access to clean water, but progress towards the sanitation targets has been much slower. Many Muslim countries in Africa are falling short of both targets.

MALAYSIAN CONTEXT

Malaysia, a Muslim nation has made progress towards achieving the MDG targets. Political stability, strong political will, commitment by health care providers and policy makers have contributed to the remarkable achievement in the health status of its population. The under-5 mortality ratio has significantly been reduced from 16.8 per 1,000 live births in 1990 to 8.5 per 1,000 live births in 2010. The maternal mortality ratio declined from 44 per 100,000 live births in 1991 to 27.3 per 100,000 live births in 2010. Deliveries by skilled attendants have increased from 92.8 percent in 1990 to 98.6 percent in 2010. The improvement in maternal and child health is the result of the introduction of various policies and programs which include improving access to and quality of health services by expanding health care facilities enhancing the professional skills of trained delivery attendants to manage pregnancy and delivery complications, providing free comprehensive childhood immunization as well as provision of safe water supply and proper sanitation in both urban and rural areas. The challenge to achieve the targets for MDG 4& 5 will require improving knowledge and skill of health care providers, provision of family planning services for high risk mothers, expanding Integrated Management for Childhood Illness Program and prevention of childhood injuries.

Malaysia's response to HIV/AIDS is characterized by its' policy of openness about the disease. Malaysia has been experiencing a consistent downward trend of newly reported HIV cases from its highest rate of 28.5 per 100,000 population in 2002 to 12.2 per 100,000 population in 2011. Key factors towards ensuring the success in reducing HIV/ AIDS are pre-marital screening, prevention of mother-to-child transmission (PMTCT) program and the Harm Reduction Approach which includes the Needle Syringe Exchange Program and Methadone Maintenance Therapy. The provision and access to Anti Retroviral Treatment (ARV) and its cost reduction has allowed for a wider range of ARV drugs to be subsidized, making it possible to provide first line treatment accessible to all patients and at no charge.

The incidence of malaria has shown a decreasing trend from 29 per 10,000 in 1990 to 2.5 in 2009. Although Malaysia has achieved its MDG target for malaria, we are moving towards MDG–plus target of completely

eliminating malaria by 2020.
Tuberculosis remains a public health challenge in Malaysia. Malaysia, as with other developing countries, has shown an increasing number of cases reported for the past few years. To achieve the target by 2015, the Ministry of Health has developed a 5-year (2010 to 2015) National Strategic Plan (NSP) for TB Control.

Progress on the other health related MDGs showed that the prevalence of underweight children below five years of age decreased from 25 percent in 1990 to 4.6 percent in 2010. In 2010, 95.8 percent of rural population has access to Safe water, 97.7 percent of houses have sanitary latrines, and 71 percent were served with waste disposal. We have been successful in putting in place the required mechanisms to allow us to purchase the affordable generic drugs which are provided in hospitals and health clinics.
Malaysia aspires to become a high income country within which the health care system will be transformed to meet the needs of the population.

CONSTRAINTS AND CHALLENGES

The reality is that many Muslim countries have made substantial progress on some goals but face a unique set ochallenges in achieving the others – thus resulting in a wide variation of progress. The relatively poor economic performance in the 1990s and early 2000s, life-threatening crises as a consequence of increased political tensions, armed conflict and HIV/AIDS have all hindered progress. The prospects of falling short of achieving the health related Goals are very real namely for Afghanistan, Djibouti, Iraq, Pakistan, Somalia, Sudan and Yemen. In addition, globalization, poverty and inequity have aggravated these problems and created new ones. Rural to urban migration has caused a growth of slums and ongoing conflicts in some countries have destroyed basic social structures. Many challenges remain and are likely to become even more difficult with the current economic climate and global warming. Global warming has become more apparent and will have an impact not only on agriculture and food production but also the disease prevalence such as malaria.

The tsunami of December 2004, which hit Indonesia, a Muslim country, is a vivid reminder of the natural disasters that prevent many countries from meeting their development goals. While floods, earthquakes and droughts batter some countries, others are afflicted by disasters of human origin such as ethno-religious and political conflicts which have taken a grievous toll in nearly a third of Muslim nations. The health care coverage remains significantly poor in many Muslim nations mainly due to the lack of adequate and suitable financial resources, poor health infrastructure, insufficient trained health workforce and slow progress on health reforms.

SUMMING UP

My last message ladies and gentlemen, 'What is needed is the commitment of everyone, at all levels, to see Muslim nations achieve the MDGs by 2015'.

Muslim countries are building upon the strength of Islamic traditions — self-help, solidarity and protection of the people especially the vulnerable. Many of these countries demonstrably require additional resources, hence the flow of developmental assistance needs to be increased, with the wealthier Muslim countries assuming their responsibility towards the poorer nations by providing the necessary funding and technical expertise. Without good inter-country cooperation, achieving the health related MDGs is likely to remain illusive for many Muslim nations. Nevertheless, Muslim nations have reiterated their commitment to give high priority in providing optimum and quality health care to their population at the third Islamic Conference of Health Ministers held in Astana, Republic of Kazakhstan in October 2011.

If we are to meet the MDGs, there is no time to rest, with only 3 years 3 months to go, I am confident that the momentum gained here in Kuala Lumpur will result in a new sense of urgency to prepare us for the final push to achieve the MDGs by 2015 and fulfill the hopes of millions of people in the Muslim nations.

Before I end, I sincerely hope the organizers will give you sufficient time to explore what is outside this conference facility and for you to visit and see what Malaysia has to offer .

On that note, it is now my pleasure to officially open the FIMA 2012 conference.

Thank you for your attention.

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HEALTH CHALLENGES OF DEVELOPING MUSLIM COUNTRIES: THE WAY FORWARD

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Abstract:

Healthcare situation in developing Muslim countries is a matter of great concern. The Muslims form around 23.8% of the world population. A large number of these Muslims lack access to quality preventive and curative healthcare facilities. Many of the Muslim majority countries have the lowest level of financial and social development. The main reason for this deplorable situation is poverty, illiteracy, dictatorial regimes, unstable and non-viable economies. There is growing awareness in Muslim countries across the globe of the need for progress in education, healthcare, environmental activities and income generation. The main causes of suboptimal levels of the Human development index (HDI) will be discussed. Short, intermediate and long term solutions are suggested. Concerted short and long efforts, backed by a confident political will and drive, can address and resolve these problems and allow the developing Muslim countries to meet these challenges.

Keywords:
Human development index, Millennium development goals, preventive health care, Muslim organizations, developing countries.

Introduction:

Muslims form one of the largest religious groups in the world with an estimated population of 1.6 billion[1].The level of financial and social development of most of the Muslim countries is way below the standards of the developed world[2]. These countries, a home to vast natural resources, are lacking a capacity to build their own infrastructure of preventive and curative health. In addition they are not getting the share they deserve from global welfare[3]. Muslims who make up 23.8% of the world population, have unfortunately produced only around 8% of the global economic output in 2011[4]. The average per capita income in many Muslim countries appears to hover below the average of other developing countries. Poverty in Muslim countries tops the list of the most serious problems that requires a solution. Twenty two of the Muslim countries are among the least developed countries. Wars, violence and natural disasters taking place in the Muslim World have further aggravated poverty and severely compromised any true progress[2,4,5,6].

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Muslim majority countries are far behind the world standards in social realms of development, like the Human Development Index (HDI) which includes multiple parameters relating to education and health[2,7,8] . The rate of literacy in these countries is below the global average. Likewise, they have a multitude of shortcomings in providing health services to people in accordance with modern standards[2,4,6].

The dilemma of political systems:

The main responsibility for this lack of human development in Muslim countries lies primarily with Muslims themselves. The unpopular, dictatorial, corrupt and puppet regimes in the Muslim countries work on the doctrine of adhocism and fascism[2,5,9] . These governments are despised by their people as proved in the "Arab Spring". The people demand a revolutionary change which can bring them fair chances to thrive and grow economically and promise them better social services for themselves and their future generations.

Indeed, the Millennium development goals (MDG)[4, 5] and 6, for child and maternal health and eradication of communicable diseases in the Muslim world, appear unlikely to be achieved without attention to the core issues. It needs an accessible, acceptable, affordable and user friendly approach harmonized and patronized by the United Nations (UN). Governments and institutions, like the Organization of Islamic Cooperation (OIC), the Islamic Development Bank (IDB), and organizations such as FIMA, IMAs and other similar non-governmental organizations of different countries, need to work together to achieve a sustainable healthy and disease-free future to our newer generations[3,10].

Adverse challenges:

Despite incredible improvements in health since 1950, there are still a significant number of challenges, which should have been easy to solve11, such as access to health care systems, overcoming or curtailing the load of non-communicable diseases such as cardiovascular disease, cancer, diabetes, chronic lung diseases, malnutrition and infectious diseases. AIDS/HIV has spread rapidly especially in the African Muslim countries[3]. Tuberculosis kills 0.4 million people each year[12], with 2.3 million new cases a year. Three hundred thousand people still die from pneumococcal diseases every year, making it the number one vaccine-preventable cause of death

worldwide. Malaria causes some 50 million acute illnesses and over 150,000 deaths annually13. More than half of the victims are children, even though effective immunization, which includes vaccine and safe injection equipment, costs less than 1 US dollar and has been available for more than 40 years[14].

Economic policies, such as Structural Adjustment Programs (SAPs), enforced by the International monetary Fund (IMF) and the World Bank for decades on poor Muslim countries have had a disastrous effect on health. SAPs were designed as an economic measure to promote fiscal austerity for poor countries that were burdened with heavy debt repayments to the rich countries. With the economic and third world debt crisis in the 1970s and 1980s, developing countries were pressured to take on these SAPs. Economies were restructured to ensure debt repayment to the rich countries, but this meant reducing the standards of living for most people[2,6,11,15].

Multinational pharmaceutical companies neglect the diseases of the tropics, not because the science is impossible but because there is, in the cold economics of the drugs companies, no market. There is, of course, a market in the sense that there is a need: millions of people die from preventable or curable diseases every year. But there is no market in the sense that, unlike Viagra, medicines for diseases such as leishmaniasis are needed by poor people in poor countries with meager purchasing power. Pharmaceutical companies judge that they would not get sufficient return on research investment, so why, they ask, should we bother? Their obligation to shareholders, they say, demands that they put the effort into trying to find cures for the diseases of affluence and longevity, heart disease, cancer, Alzheimer, etc. Out of the thousands of new compounds drug companies have brought to the market in recent years, less than 1% are for tropical diseases[9,16.]

Addressing health problems goes beyond just medical treatments and policies. It goes to the heart of social, economic and political policies that not only provide for healthier lives, but also to a more productive and meaningful life that can benefit other areas of society[4,8,11,17].

The developing Muslim countries bear around 90% of the disease burden, but allocate less than 10% of their annual budget to healthcare. This disproportionate priority is disastrous and places these countries in a vicious cycle of ill health, poverty and backwardness. Perhaps, a

great deal of the underlying causes of disease, injury and death in these countries lies beyond the preview of the healthcare system. They cover a range of physical factors (inadequate sanitation, water, drainage, waste disposal, housing and household energy) and behavioral factors (personal hygiene, sexual behavior, driving habits, alcoholism and tobacco smoking). Many of these environmental and occupation-related health problems turn into public health problems when they become widespread, a factor aggravated by inadequate public health infrastructure[6,8,10].

Roles of health professionals:

The medical profession has a great challenge in tackling these health related problems in developing countries. The first task is the reversal of the brain drain syndrome that is currently taking its toll, not only in the health sector but also in other vital areas of the national life of developing countries[6,11]. It is ironic that such developing countries that should be manpower recipients are actually manpower donors. This has led to the depletion of the available human resources, especially of the highly skilled medical professionals11. To worsen matters, some of the available health professionals are aversive to working in public health facilities and rather engage in lucrative private medical practices, which are out of reach for most of the poor population in these countries. Some countries are left with just 500 doctors each with large areas without health workers of any kind. Blindness, as an example, is most prevalent in developing countries, where around 90% of the world's blind people live[19].

Lack of facilities and equipment to work with are issues to contend with. It is frustrating but not uncommon that a radiologist could be employed in a facility without functioning X-Ray machine or ultrasound, or a neurosurgeon could be working in a facility without computerized tomography (CT) equipment. Health systems should be strengthened with both human and material resources to make them functional. Indeed, the availability of skilled health providers (particularly midwives, nurses, doctors and obstetricians) is critical in assuring high quality health care delivery. Indeed, the MDG 4 and 5 for child and maternal health are unlikely to be achieved without attention to the recruitment and retention of health professionals. Their services should be made accessible, acceptable, affordable and user friendly, and should be equitably distributed in both rural and urban communities[20].
Islamophobes blame Islam as the

cause of the backwardness of Muslim nations. But the reality is contrary to that. Islam is a religion of progress, innovation, and development. After their downfall, the Muslims, who were once ruling 80% of the then known world, became enslaved, both physically and intellectually. They lost the flame which their ancestors carried. After vigorous struggles, the colonial powers were forced to leave many countries. However, they only left physically but remained intellectually and psychologically. In other words, they handed the rule and the government affairs to their chosen representatives or puppet regimes. Thus, the people in many countries never got real independence. They continue to be in an ongoing struggle between themselves and their governments to get access to basic human rights and essential life saving necessities[21].

There is insignificant emphasis on preventive health in these developing countries. Nearly 0.3 billion people - about one in eight - do not have access to clean drinking water. More than one million people die each year from water-related disease, with 43% of water-related deaths are due to diarrhea[3,7]. 0.25 Billion people lack access to improved sanitation. The Maternal mortality rate, one of the goals in MDG, has not been met by 50% of target countries[22].

Prevention and cure of many of the illnesses in developing countries can be achieved but there are many challenges, some of which have been discussed above. Can these challenges be met and poverty eradicated from developing Muslim countries? Private charity is an act of privilege, but it can never be a viable alternative to "state obligations" [17,21]. Industry and private donations are feel-good, short-term interventions but do not substitute for the vastly larger, and essentially political task of bringing health care to more than a billion poor people[6,1]

Conclusions:

The developing Muslim countries need to develop an approach towards the solution of their long standing healthcare issues.These can be divided into long term goals, Intermediate plans and short term goals. It is not possible to give a specified road map as a general yardstick; every under-developed Muslim country has its own inherent set of issues, challenges and circumstances which may be altogether different from the others. Yet the general guidelines may be considered the essential remedial measures in order to ensure a phased out development plan in the areas of

social development, keeping in view the Millennium development goals as an achievable target.

This will require getting rid of autocratic, fascist, dictatorial and corrupt regimes. Democratically elected governments with popular public support representing masses at the grass root level, keeping in view the solution of problems faced by the commoners as their foremost priority will be the only way to trigger a development process which ensures broad-based improvement in the quality of life of the people, especially the poor[3].

Freedom from the pressure of IMF, World Bank, ADB and other funding exploiters that dictate their own terms and add to the ever growing poverty has to be diplomatically dealt with. Commitment for non dependence on loans and debts in the future has to be promised. The Muslim collaborating bodies such as the Organization of Islamic Cooperation (OIC) can play a pro-active role. It can mobilize a consortium to invest in the health sector by setting up model institutions for provision of curative and preventive healthcare. Islamic Development Bank with its reserves exceeding 44 billion dollars can mobilize its finances in setting up capacity building measures, including raw material manufacturing units and diagnostic manufacturing industry in countries like Turkey, Malaysia, Bangladesh, Indonesia, Pakistan, Egypt and other countries. Setting up of vaccination units that provide very economic vaccines is one of priorities in Central Asian and African Muslim Countries. There should be a realistic planning to make use of abundant non professional manpower available in Muslim countries. These organizations should collaborate and assist the ongoing research conducted in the fields of eradication of malaria, TB, AIDS and other communicable disease and also to fight the new menace of non communicable diseases (NCD) posing newer challenges in the years to come.

As promised by the United Nations (UN) and the signatories from the developed countries, proper utilization and channeling of available resources is mandatory, so as to improve the preventive health services in these countries. Access to cheaper yet quality medicine and less expensive diagnostic facilities can make quality treatment more accessible. The issue of dissemination of scientific information and the counteraction of the myths and false propaganda attached to vaccination and preventive health measures has to

be vigorously pursued. Necessary help of print/electronic media, cellular phones messaging, etc has to be properly utilized.

It is reported that 40% of available funds for preventive and curative healthcare are embezzled, misappropriated or used in useless projects. These issues need to be addressed and rectified[3] . Introduction of private and public sector health insurance services will contribute to improvement of access to healthcare by the masses[23,24].

Preferential pricing of medicines, vaccines, diagnostics including not-for-profit pricing of medicines for TB, AIDS, malaria and upcoming epidemics of non communicable diseases shall be ensured. The funds have to be mobilized in investing in research and development (R&D) to target diseases that disproportionately affect the developing world. Community investment activities and partnerships to foster effective healthcare, innovative partnerships and solutions such as bulk / toll manufacturing of products for improving healthcare (both preventive and curative) have to be prioritized. Communities, companies and groups that respond sensitively and with commitment to address such challenges will be the leaders of the future.

Only these concerted long and short term efforts backed by a confident political will can address and resolve these problems and empower the developing Muslim countries to meet these challenges.

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MEN AND WOMEN'S HEALTH: CURRENT ISSUES

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ABSTRACT:

Men and women are the creatures of Allah who have different roles / responsibilities but equal reward. They must have optimal health during their activities in daily life. However, the social system alignments to men often become a barrier to women in getting the right of health.

Methods: literature review

Results: Of the estimated 57 million global death in 2008, 36 million (63%) were due to non-communicable diseases (NCDs). The total number of annual NCD deaths is projected to reach 55 million by 2030, whereas the annual infectious disease deaths are projected to decline. Heart disease and cancer were the biggest killers for men and women. The ratio for male to female deaths of heart disease was 1.5 and of cancer was 1.4. Ten percent of men and 14 % of women in the world become obese with all its effects. In 2010, there was an estimated 216 million cases of malaria, 8.8 million new cases of tuberculosis and 2.7 million people were newly infected with HIV. Women in the developing countries face 15 times the risk of dying during pregnancy or child birth. Most of the 40 countries with high maternal mortality rates (MMR) are in sub-Saharan Africa where 500 women die per 100,000 live births.

Conclusion:

Deaths due to NCD sare projected to increase whereas deaths due to infectious diseases are projected to decline. Socio-economic problems, including gender inequality, poor governance, and lack of resources are the problems that affect the health conditions in developing countries.

Keywords: Non-communicable diseases, obesity, malaria, tuberculosis, HIV, developing countries, maternal mortality rate, life expectancy.

Introduction:

In most countries, women are treated as second-class citizens. This leads to many health hazards, including physical and sexual violence. In Islam, men and women are the

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creatures of Allah who have different responsibilities / duties but get equal reward. They must have optimal health during their activities in daily life. However, the social system alignment to men often becomes a barrier to women in getting the right of health. On the other hand, uncontrolled equality makes women in developing countries neglect their own health [1].

Health is a human right. No one should be sick or die because of gender inequality. "The obstacles that stand in the way of better health for women are not primarily technical or medical in nature. They are social and political, and the two go together." Dr Margaret Chan, WHO Director-General, Department of Gender, Women and Health stated [2].

In many developing countries, many women die due to complications of pregnancy and child birth. Professor Mahmoud Fathalla [past president of the International Federation of Gynecology and Obstetrics (FIGO)] said in the World Congress in Copenhagen: *Women are not dying because of a disease we cannot treat. They are dying because societies have yet to make the decision that their lives are worth saving"* [3].

The United Nations Millennium Declaration embraces a vision for a world in which countries work in partnership for the betterment of all, particularly the most disadvantaged. This vision was transformed into eight Millennium Development Goals (MDGs). Three of the goals are health-specific, addressing child health (MDG 4), maternal health (MDG 5), and combating HIV/AIDS, malaria, tuberculosis and others (MDG 6). The other goals address key determinants of health including poverty, hunger, gender equality, environmental sustainability, and global partnership for development [4].

With only two years remaining to 2015, there are signs of progress in many countries in achieving the health-related MDGs. In other countries, progress has been limited because of conflict, poor governance, economic or humanitarian crises, and lack of resources [5].

Maternal Health (MDG 5)

There are two targets for assessing progress in improving maternal health: reducing the maternal mortality rate (MMR) by three quarters between 1990 and 2015, and achieving universal access to reproductive health by 2015 [6].

In the world, every two minutes, a woman dies from pregnancy or child birth-related causes. One third of all these maternal deaths take place in just two countries: India with 20 % of the global total (56,000 deaths) and Nigeria with 14 % (40,000 deaths).In the past 20 years, the number of maternal deaths has been reduced by almost 50 % from more than 540,000 deaths in 1990 to less than 290,000 in

2010[7].

Maternal mortality is the health indicator that shows the widest gap between richer and poorer, both between and within countries[5]. Women in developing countries face 15 times higher risk of dying during pregnancy and child birth than in developed countries. Most of the 40 countries with high MMR are in sub-Saharan Africa where 500 women die per 100,000 live births, compared with only 27 per 100,000 in the World Health organization (WHO) European Region. In both the WHO African region and the WHO South-East Asia region, less than 50% of women received skilled care during childbirth[6-8].

The major causes of maternal deaths are: hemorrhage (25%), infections (13%), unsafe abortions (13%), eclampsia (12%), obstructed labor (8%), other direct causes (8%), and indirect causes (20%). Indirect causes are diseases such as malaria, anemia, HIV/AIDS and cardiovascular disease, that complicate pregnancy or are aggravated by it[6].

Over 90% of maternal deaths occur in developing countries. Forty-five percent of postpartum deaths occur within the first 24 hours[8].

Maternal death watch is a description of how many women in the world are threatened in their reproductive health (Table 1)[9,10].

Table1. Description about maternal death watch[9,10]

	Every year	Every minute
Pregnancies	180-200 million	380
unwanted Pregnancies	75 million	190
Induced abortion	50 million	110
Unsafe abortion	20million	40
Maternal deaths	600,000	1

The evidence shows that high maternal, neonatal and child mortality rates are associated with inadequate and poor-quality maternal health care, including antenatal care, skilled attendance at birth and postnatal care[11-14].

These problems are caused by[9,10]:

- Lack of knowledge and preparedness about reproductive health in the family, community, and health providers.
- Inadequate number of reproductive health specialists.
- Inadequate level of competency to manage complicated pregnancies and deliveries.
- Inadequate quality and access to all levels of obstetric care and other reproductive health Services.

In some countries these problems could be described as three delays models. There is delay in decision to seek care, delay in reaching care, and delay in receiving care. The causes of the first delay are lack of

understanding of complications, acceptance of maternal death, low status of women and socio-cultural barriers to seeking care. The cause of the second delay is residence in mountains, islands, and isolated areas with poor access to transportation, the causes of the third delay are lack of and /or poorly trained personnel with punitive attitude and lack of funds.[9,10]. To reduce the number of maternal deaths, women need access to good-quality reproductive health care and effective interventions[6].

Current Health Conditions:

Of the estimated 57 million global deaths in 2008, 36 million (63%) were due to non-communicable diseases (NCDs) [5,15,16]. NCDs include autoimmune diseases, , stroke, cancer, asthma, diabetes, chronic kidney disease, , Alzheimer's disease, etc[17].

Out of the 35 million people who died from NCDs in 2005, half were under age 70 and half were women. It is projected that the annual number of deaths due to cardiovascular disease will increase from 17 million in 2008 to 25 million in 2030, with annual cancer deaths increasing from 7.6 million to 13 million. As a result of such trends, the total number of annual NCD deaths is projected to reach 55 million by 2030, whereas annual infectious disease deaths are projected to decline over the next 20 years[18].

Risk factors such as a person's background, lifestyle and environment are known to increase the likelihood of certain NCDs. Worldwide, every year, at least 5 million people die because of tobacco use. High cholesterol accounts for roughly 2.6 million deaths and 7.5 million die because of high blood pressure [19,20].

About 2.8 million die from being overweight or obese (BMI > 30 kg/m2) Obesity increases the likelihood of various diseases, particularly heart disease, type 2 diabetes, obstructive sleep apnea, certain types of cancer, and osteoarthritis [17] . Obesity is most commonly caused by a combination of excessive food energy intake, lack of physical activity, and genetic susceptibility, although a few cases are caused primarily by genes, endocrine disorders, medications or [19,20]. Between 1980 and 2008 the worldwide prevalence of obesity almost doubled. Ten percent of men and 14 %of women (half a billion people) in 2008 were obese, compared with 5 % of men and 8 % of women in 1980[5].

The Global Burden Disease study is a collaborative effort between the Harvard School of Public Health, WHO and World Bank. It showed that based on current trends there will be a shift of types of disease affecting world population from 1990 to 2020.

The 10 most common diseases in 1990 were infectious diseases like lower respiratory tract infections and diarrheal disease, but from WHO reports at 2005 and 2008 the prediction for 2020 that NCDs will be at the top, will prove to be true. However, TB still remains no. 7 and needs our special attention.HIV became a threat for world population[5,15,16,21(Figure 1)].

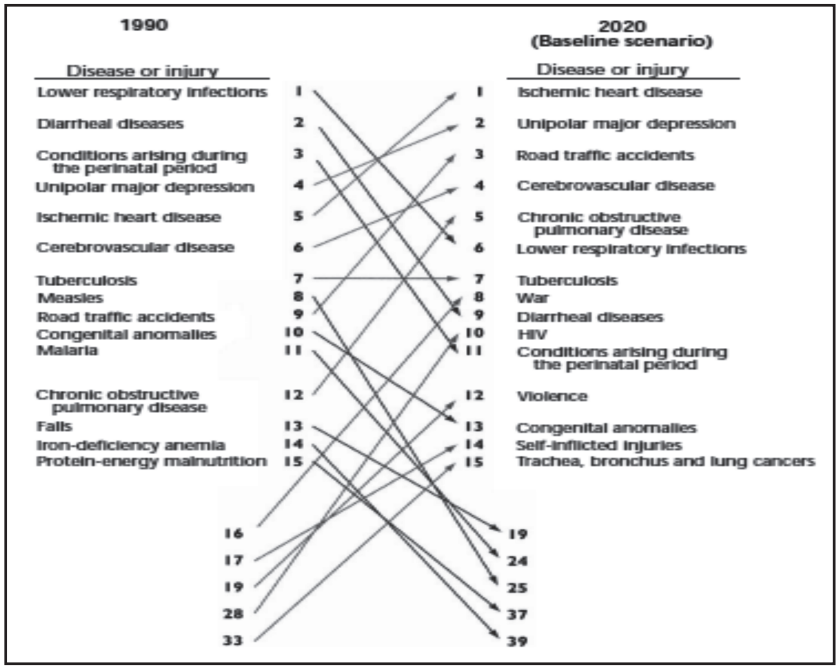

Figure1. Change in the rank order of disease burden for leading causes, world 1990-2020[21]

HEALTH IN MUSLIM COUNTRIES:

Many Muslim countries are in Africa, and South East Asia . They exhibit similar conditions: low socio-economic standards, lack of adequate human resources and poor environment. Of 190 UN countries, 48 were classified as Muslim-majority countries (MMC) and 142 as non -MMC. These countries were subdivided into 4 groups based on UN Gross National Income (GNI) per capita: Low income countries (⩽ US$ 905), lower middle income countries (US$ 906–3595), upper middle income countries (US$ 3596–11,115) and high income countries (⩾ US$ 11, 116)[22].Based on this classification 43.8 % of MMC are in the low income countries group[23].

Table 2 Classification of the Muslim-majority countries used for the study by income groups (*n*=48)

Low-income Muslim countries (*n*=12)	Lower-middle income Muslim countries (*n*=15)	Upper-middle-income Muslim countries (*n*=6)	High-income Muslim countries (*n*=6)
Afghanistan	Albania	Kazakhstan	Bahrain
Bangladesh	Algeria	Lebanon	Brunei Darussalam
Burkina Faso	Azerbaijan	Libyan Arab Jamashiriya	Kuwait
Chad	Djibouti	Malaysia	Qatar
Comoros	Egypt	Oman	Saudi Arabia
Gambia	Indonesia	Turkey	United Arab Emirates
Guinea	Iran (Islamic Republic of)		
Guinea-Bissau	Iraq		
Kyrgyzstan	Jordan		
Mali	Maldives		
Mauritania	Morocco		
Niger	Palestine		
Nigeria	Syrian Arab Republic		
Pakistan	Tunisia		
Senegal	Turkmenistan		
Sierra Leone			
Somalia			
Sudan			
Tajikistan			
Uzbekistan			
Yamen			

Table2. Classification of the Muslim-majority countries by income groups (n=48)[23]

Using demographic, socio-economic indicators that is life expectancy, infant mortality rate (IMR), and maternal mortality rate (MMR), there was significant difference between MMC and non-MMC. MMR and child (< 5 year) mortality rates were almost twice as high in MMC. It is likely that the 3-year difference in overall life expectancy between MMC and non-MMC is largely mediated by excess early mortality (Table 3). Low GNI was one of the key determinants of poor health indicators in MMC. The second was the literacy rate. There are mortality differences of up to 4-fold between infants born to mothers with no education compared with those whose mothers have had secondary education[26].The third was the availability of clean water. One of the classic public health interventions, clean water is known to control the spread of communicable diseases[28]. Purification of water alone was thought to be responsible for half of all mortality reductions in some developed countries in the first half of the 20th century [23].

VARIABLE	Mean in MMC	Mean in Non MMC
DEMOGRAPHIC AND SOCIO-ECONOMIC INDICATORS		
IMR/1000 live birth	56	34
< 5 yr. mortality rate (per 1000 live birth)	80.5	51.9
MMR/10,0000 birth	455	266
Total life expectancy (years)	64.2	66.7
Health indicators		
Low birth weight (% of births)	13.4	9.8
HIV prevalence (per 100,000 population)	839	2653
YPLL due to communicable disease (years)	47.8	36.1
YPLL due to non-communicable disease (years)	38.1	49.8

Table 3. Demographic, Socio-economic and Health Indicators of the MMCs and non-MMCs[23]

IMR: Infant morality rate. MMR: Maternal mortality rate.
HIV: human immunodeficiency virus. YPLL: years of productive life lost.

Facts on Women's Health:

World Health organization (WHO) defined health as "a state of complete physical, mental and social well-being and not merely the absence of diseases or infirmity". It focuses on only 3 aspects, but because we are Muslims, we need to add another important aspect, that is spiritual health. With good spiritual health, our physical, mental and social status become more complete. In the Glorious Quran it is said that the winners are those who are fully submitting in their prayers, those who avoid vain talk, perform Zakah, and avoid sex except with their legal spouses[24]. These Muslims are healthy by the modern definition of health. They pray to Allah (spiritual health), keep their activity and not waste time (mental and body health), keep good relation with their society (social health), and properly maintain the lineage of their offspring (body, mental and social health).

Another Quranic verse states "*And come not near to unlawful sex. Verily, it is Fahishah (immoral sin) and an evil way*"[25]. From the above we gather that many health problems like HIV/AIDS, sexually transmitted diseases (STDs) unsafe abortion, unwanted pregnancy and others, can be resolved largely through behavioral change not to come near to unlawful sex[35].

World			
Rank	Cause	Deaths (000s)	%
1	Ischaemic heart disease	3371	12.2
2	Stroke	3051	11.1
3	Lower respiratory infections	2014	7.3
4	COPD*	1405	5.1
5	Diarrhoeal diseases	1037	3.8
6	HIV/AIDS	1013	3.7
7	Diabetes mellitus	633	2.3
8	Prematurity and low birth weight	567	2.1
9	Neonatal infections**	546	2.0
10	Hypertensive heart disease	530	1.9

Low-income countries			
Rank	Cause	Deaths (000s)	%
1	Lower respiratory infections	1397	11.4
2	Ischaemic heart disease	1061	8.7
3	Diarrhoeal diseases	851	7.0
4	Stroke	749	6.1
5	HIV/AIDS	742	6.1
6	Maternal conditions	442	3.6
7	Neonatal infections**	426	3.5
8	Prematurity and low birth weight	405	3.3
9	Malaria	404	3.3
10	COPD*	404	3.3

Middle-income countries			
Rank	Cause	Deaths (000s)	%
1	Stroke	1842	16.4
2	Ischaemic heart disease	1659	14.8
3	COPD*	875	7.8
4	Lower respiratory infections	451	.0
5	Hypertensive heart disease	319	2.8
6	Diabetes mellitus	309	2.8
7	HIV/AIDS	264	2.4
8	Breast cancer	231	2.1
9	Stomach cancer	201	1.8
10	Trachea, bronchus and lung cancers	191	1.7

High-income countries			
Rank	Cause	Deaths (000s)	%
1	Ischaemic heart disease	650	15.8
2	Stroke	459	11.2
3	Alzheimer and other dementias	195	4.7
4	Lower respiratory infections	165	4.0
5	Breast cancer	163	4.0
6	Trachea, bronchus and lung cancers	159	3.9
7	Colon and rectum cancers	130	3.2
8	COPD*	126	3.1
9	Diabetes mellitus	123	3.0
10	Hypertensive heart disease	91	2.2

Table 4.10 Leading Causes of Death in Females by Country Income Group, 2004[27]

In most countries, life expectancy of women is higher than men. But because of a number of health and social factors, unequal access to information, care and basic health practices do increase the health risks for women. The leading cause of death in females in low income countries is infection (communicable disease) [27(Table 3)].

*Chronic Obstructive lung Disease

WHO reported 10 facts about women`s health[1]:

1. Smoking rates among men tend to be 10 times higher than women, but smoking rates in younger females in developing countries is rising rapidly.

2. Sixty one per cent of all adults living with HIV/AIDS in sub-Saharan Africa are women. In the Caribbean region the proportion of women living with the virus is 43 %.

3. Between 15 – 71 % women around the world have suffered physical or sexual violence by their spouses.

4. Violence against women is widespread around the world. Some studies show that up to 1 in 5 women reports being sexually abused before the age of 15.

5. Even though early marriage is on the decline, an estimated 100 million girls will marry before the age of 18 over the next 10 years. This one third of the adolescent girls are in developing countries (excluding China).

6. About 14 million adolescent girls become mothers every year. More than 90% of these very young mothers live in developing countries.

7. Every day, 1600 women and more than 10,000 newborns die from preventable complications during pregnancy and childbirth. Almost 99% of maternal and 90% of neonatal mortalities occur in the developing world.

8. When women earn an income, they are more likely than men to buy the nets for their households. Insecticide treated nets (ITNs) reduce malaria cases in pregnant women and their children.

9. Every day, women tend to be in charge of cooking. When they cook over open fires or traditional stoves, they breathe in a mix of hundreds of pollutants on a daily basis. This indoor smoke is responsible for half a million of the 1.3 million annual deaths due to chronic obstructive pulmonary disease (COPD) among women worldwide.

10. Across the world and at all ages, women have a significantly higher risk of becoming visually impaired than men. Even so, women do not have equal access to health care to treat eye diseases often due to their inability to travel unaccompanied to health facilities and cultural differences in the perceived value of surgery or treatment for women.

Female Genital Mutilation:

Female genital mutilation (FMG) refers to all procedures involving partial or total removal of the external female genitalia or other injury to the female genital organs for non-medical reasons [36].

The WHO/UNICEF/UNFPA (Spell out the last 2) Joint Statement classified female genital mutilation into four types:

Type I: Partial or total removal of the clitoris and/or the prepuce (clitoridectomy).

Type II: Partial or total removal of the clitoris and the labia minora, with or without excision of the labia majora (excision).

Type III: Narrowing of the vaginal orifice with creation of a covering seal by cutting and partially suturing the labia minora and/or the labia majora, with or without excision of the clitoris (infibulations).

Type IV: All other harmful procedures to the female genitalia for non-medical purposes, for example: pricking, piercing, incising, scraping and cauterization [36].

The issue of female circumcision, although practiced in only very few Muslim communities, especially in Africa, is currently receiving a systematic prohibition drive by WHO and several other agencies.

Current Fiqh (Islamic Jurisprudence) have addressed this issue in countries with traditional, pre-Islamic practice of female circumcision, and has clarified the following issues:

- No mention of this issue in the Qura'n and authenatic (Sahih) Sunnah.
- All the Prophetic sayings (Ahadith) are either incorrect or weak, including the Hadith *(Al Khitan is sunnatu li al-rijal wamakrumtun li al-nissa)* [29], meaning: Circumcision is sunnah for men, and dignity for women. It is well known among Shari'ah scholars that no Fiqhi ruling could be established on weak (Ahadith).
- This issue was addressed by Shaikh Dr. Al-Qaradawi [30] Who stressed the point that female circumcision is not practiced in most Muslim countries. In Egypt and Sudan, the practice dragged on from the era of the Pharos and is still practiced in some communities.

In all pillars of Jurisprudence, including the *Qura'n. Sunnah, Ijmau and Qayas,* there is no single evidence of mandatory (wajib) female circumcision or its prohibition (Tahrim).

Muslim scholars are in agreement that it is permissible (Mubah). It is known among scholars that such permissible issues become forbidden, partially or totally, if there is evidence of harm or evil.

Current medical opinion is clear that female circumcision is harmful in

several aspects, physical, psychological and social, unless, in certain cases,where it may be medically indicated.

This jurisprudence opinion was supported by the Medical Fiqhi Encyclopedia[31].

Dictum fatwa of Indonesian Ulama Council (Majelis Ulama Indonesia) [32,33]:

First: the legal status of female circumcision. Circumcision for men and women including the nature(rules) and the symbols of Islam. Circumcision of women is makramah (dignity), its implementation is a form of worship that is recommended.

Second: Prohibition of female circumcision is contrary to the provisions of Shari'ah (Islamic jurisprudence)

Third: The Implementation of female circumcision. The procedure should be limited to removal of the membrane (prepuce) covering clitoris. It should not be done to excess, such as cutting or injuring the clitoris resulting in hazards and adverse outcomes.

Circumcision, in that sense, is an act of worship that is "dogmatic". Although it is not uncommon for religion to be dogmatic, it does usually result in positive benefits. Although the benefits of the implementation of circumcision are not known now or have not yet been discovered it is not necessary to forbid it. This is very different from the purely medical perspective. Such perspective will certainly forbid circumcision if there is no medical indication. Furthermore, in a more extreme way of looking at the matter in this way, male circumcision may well be also prohibited[32].

In the Glorious Quran:

"Say (O Muhammad to mankind): "*If you (really) love Allah, then follow me (i.e. Muhammad), Allah will love you and forgive your sins. And Allah is Oft-Forgiving, Most Merciful.*"[34]

Also the Quran says:

Say: *"Obey Allah and the Messenger. But if they turn away, then Allah does not like the disbelievers".*[35]

These verses judge against those who claim to love Allah, yet do not follow the way of Muhammad (PBUH). Such people are not true in their claim until they follow the Shari`ah including the Sunnah of Prophet Muhammad (PBUH). It is recorded in the Sahih that the Messenger of Allah said, Whoever commits an act that does not conform with our matter (religion), then it will be rejected of him (al-Bukhari - Muslim)[35].

Conclusions:

Across the world, NCDs are projected to increase, in view of several lifestyle, social and environmental factors.

Muslim-majority countries are not an exception, and the situation may be worse than in developed countries.

On the other hand, infectious diseases are projected to decline globally, with various degrees. Many Muslim-majority countries are still suffering from several epidemics, in view of socio-economic problems, poor governance, political instability and lack of resources.

Gender inequalities are still prevalent in many Muslim societies, contrary to Islamic teachings of male-female equality and equity in responsibility, accountability and human rights. Deterioration of women status is due to local inherited traditions and culture, that persisted in conflict with Islamic Jurisprudence.

It is incumbent on policy markers, health authorities and health profession organizations to adopt sound programs to remove all forms of gender inequity and injustice.

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IMMUNIZATION PROGRAMS IN THE EASTERN MEDITERRANEAN REGION

Ala Din A. Alwan*

Abstract:

An estimated 1.239 million children under five years of age died in 2008 in the Eastern Mediterranean Region (EMR). More than 20% of these deaths are attributed to diseases for which potent vaccines are currently available.

Recent years have witnessed remarkable improvement in the routine vaccination coverage in several countries of the Eastern Mediterranean Region. The average coverage with three doses of DTP-containing vaccines in the Region, based on WHO-UNICEF estimates, reached 82% in 2012. In addition, the Region achieved 93% reduction in measles mortality between 2000 and 2008. Moreover, the introduction of new life-saving vaccines gained momentum with the introduction of Haemophilus Influenzae Type b (Hib) vaccine in 20 countries, pneumococcal conjugate vaccine (PCV) in 12 countries and rotavirus vaccine in 7 countries.

Despite this progress, around 3 million infants did not receive their third dose of DTP-containing vaccines in 2012. The target of measles elimination by 2010 was not achieved and the gains in measles mortality reduction were lost with the occurrence of huge epidemics of measles in Afghanistan, Pakistan, Somalia and Sudan during 2009-2012. The introduction of new vaccines constitutes the major challenge facing middle-income countries, especially the low middle-income countries. Of the infants born in the region, 23%, 47% and 74% are born in countries that have not included Hib, pneumococcal and rotavirus vaccine respectively in their national immunization program.

There are several challenges facing efforts to up scale immunization programs in the Region. The structure and managerial capacity of immunization programs are inadequate in some countries. In addition, the relatively low government allocations for immunization programs and the growing need for financial resources to meet the evolving demands of Expanded program on immunization (EPI), including new vaccines introduction, disease eradication and

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elimination requirements, threaten the gains of the immunization programs. Furthermore, the current vaccine procurement and regulation system in several countries is inadequate, and there is a need for stronger mechanisms that ensure vaccine quality and security.

Keywords:
Expanded program on immunization (EPI), vaccination coverage, vaccine preventable diseases, Eastern Mediterranean Region (EMR).

1.Introduction:

Immunization is one of the most efficacious, cost-effective and safe public health interventions. Vaccines continue to have a tremendous impact on public health, saving millions of lives each year. Smallpox eradication, the great progress towards poliomyelitis eradication, the significant reduction in measles morbidity and mortality and the drastic reduction of *Haemophilus influenzae* type B (Hib) disease in countries that have introduced the vaccine provide clear evidence of this.

Recent years have witnessed remarkable improvement in the routine vaccination coverage in several countries of the Eastern Mediterranean Region (EMR)[1] of the World Health Organization (WHO), and hence, in control and prevention of several vaccine-preventable diseases. Based on WHO-UNICEF estimates, the average coverage with three doses of DTP (DTP3) in the Region reached 82% in 2012[2].More than 360 million people received measles vaccine through supplementary immunization activities between 2000 and 2012[3]. The Region achieved 93% reduction in measles mortality between 2000 and 2008.Maternal and neonatal tetanus has been eliminated from 17 countries and diphtheria and pertussis are no longer a public health problem in many countries. Introduction of new life-saving vaccines gained momentum in recent years with the introduction of Haemophilus Influenzae Type b (Hib) vaccine in 20 countries, pneumococcal conjugate vaccine (PCV) in 12 countries and rotavirus vaccine in 7 countries.

Despite this considerable progress, around 3 million infants in the Eastern Mediterranean Region did not receive their third dose of DTP vaccines in 2012 and the number of children who were not fully vaccinated in line with the national schedule is higher. The target of measles elimination by 2010 was not achieved and the gains in measles mortality reduction were lost with the occurrence of huge epidemics of measles in Afghanistan, Pakistan, Somalia and Sudan during 2009-2012. Introduction of new vaccines into the national immunization program constitutes a major challenge facing the middle-income countries in particular, mainly because of the relatively high prices of these vaccines. Of the infants born in the region, 23%, 47% and 74% are born in countries that have not

included Hib, pneumococcal and rotavirus vaccine in their national immunization program respectively.

2.Burden of vaccine-preventable diseases:

An estimated 1.239 million children under five years of age died in 2008 in the Eastern Mediterranean Region. More than 20% of these deaths are attributed to diseases for which potent vaccines are available. A large proportion of these deaths is due to pneumonia and diarrhoeal diseases caused by *Streptococcus pneumoniae, Haemophilus influenzae* type B (Hib), and *rotavirus*, despite the existence and availability of potent and safe vaccines[4].

Measles is still an important cause of child deaths. Even after the successful reduction in measles mortality globally, in 2008, there were still an estimated 164 000 measles deaths globally – nearly 450 deaths every day or 18 deaths every hour. During the same year, WHO estimated that 7000 measles deaths, or 20 deaths per day, occurred in the Eastern Mediterranean Region[5].

Tackling under-5 mortality with classic vaccines only is not enough if the target of Millennium Development Goal number 4 (MDG 4) is to be achieved. The possible impact that different immunization interventions may have had on vaccine-preventable diseases related to under-5 mortality and relevant to achieving the target of MDG 4 was studied by WHO and UNICEF in 2005. It was determined that if the current trend in terms of routine immunization coverage and vaccines in use continues, the impact of immunization on under-5 mortality

Table 1. WHO estimate of burden of diseases preventable by new vaccines*

Country	Hib deaths as % of <5 deaths	Pneumococcal deaths as % of <5 deaths	Rotavirus deaths as % of <5 deaths	Proportion of Hib, pneumococcal and rotavirus deaths
Afghanistan	4.1	8.0	7.3	20.6
Bahrain	0.0	0.0	0	0.0
Djibouti	4.6	6.9	4.1	17.6
Egypt	3.7	7.6	1.2	12.6
Iran, Islamic Republic of	2.8	4.7	4.2	11.1
Iraq	3.2	6.4	1.9	11.5
Jordan	3.9	6.4	1.9	12.2
Kuwait	0.0	2.5	0.2	2.7
Lebanon	3.8	6.1	0.4	10.2
Libyan Arab Jamahiriya	2.9	5.0	1.5	9.4
Morocco	4.3	7.8	4.4	16.5
Oman	3.6	6.9	0.9	11.6
Pakistan	2.9	5.7	8.3	16.9
Qatar	0.0	0.6	0.6	1.3
Saudi Arabia	0.2	4.7	1.4	6.3
Somalia	4.2	8.7	6.4	19.4
Sudan	3.9	8.0	8.2	20.0
Syrian Arab Republic	5.4	8.0	2.0	15.5
Tunisia	5.2	9.2	1.6	16.1
United Arab Emirates	0.0	2.3	0.4	2.7
Yemen	3.8	7.2	5.7	16.6
Region	3.5	7.1	6.5	17.1

* Rotavirus estimates for 2008; Hib and pneumococcal estimates for 2000, revised 2008; All estimates are before vaccine introduction except Hib disease estimates for Bahrain, Oman, Kuwait, Saudi Arabia and United Arab Emirates which are adjusted for Hib vaccine introduction

3.Situation of immunization programmes in the EMR

reduction between 2000 and 2015 would be minor. However, if routine vaccination coverage was scaled up to 90% and Hib, rotavirus and pneumococcal vaccines were widely used; a 60% to 70% reduction in under-5 mortality attributable to vaccine-preventable diseases could be reached by 2015. Therefore, scaling up routine immunization and introduction of new vaccines, especially Hib, PCV and Rotavirus Vaccines, were identified by WHO and UNICEF in the Global Immunization Vision and Strategies (GIVS) document[6], endorsed by the World Health Assembly (WHA58.15), as a cornerstone for achieving MDG 4. The estimated burden of the diseases preventable by the new vaccines in countries of the Region is shown in Table 1[7].

3.1 Immunization targets

The national immunization programmes provide vaccines against at least six diseases as part of the national Expanded Program on Immunization (EPI) in all countries of the Region. These vaccines include antigens against childhood tuberculosis using one dose of the Bacille Calmette-Guérin (BCG) vaccine, at least three doses of diphtheria, pertussis and tetanus vaccine (DPT), poliovaccine and measles vaccine. Various new vaccines are also provided by different countries, in addition to immunization of pregnant women and women of childbearing age to prevent maternal and neonatal tetanus.

Immunization programmes in the Region aim at control, elimination or eradication of all vaccine-preventable diseases through the wide-scale use of quality-assured effective vaccines and technologies, as well as safe immunization practices. The global and regional targets of immunization programmes are to:

- Achieve at least 90% DPT3 coverage at national level and at least 80% in every district by 2015.
- Eradicate poliomyelitis.
- Reduce measles mortality by at least 95% compared to the 2000 level by 2015.
- Eliminate measles from all countries of the Region by 2015.
- Eliminate maternal and neonatal tetanus by 2015.
- Reduce hepatitis B surface antigen prevalence to less than 1% among children aged less than 5 years in all countries of the Region by 2015.

3.2 Current situation of routine immunization:

Routine immunization is the most cost-effective vaccination delivery strategy. It is the back-bone of all vaccination activities and the basis for achieving and sustaining all immunization targets. High routine vaccination coverage is the cornerstone for achieving and sustaining poliomyelitis eradication and measles elimination and the successful introduction of and access

of the children to new vaccines.

Vaccination coverage for the third dose for DPT (DPT3-containing vaccines) among children below 1 year of age is the main indicator of successful routine immunization services. Situation of DPT3 coverage is countries of the EMR shown in figure 1[8].

Substantial improvement in routine immunization services was achieved over the past few years. Fourteen countries have achieved the target of 90% coverage at national level, while Djibouti, Lebanon, Pakistan and Yemen are progressing towards this target (Figure 1). The regional average for DPT3 reached 82% in 2012, progressing from 73% in the year 2000 (figure 2)[9].Maternal and neonatal tetanus has been eliminated from 17 countries and diphtheria and pertussis are no longer a public health problem in many countries.

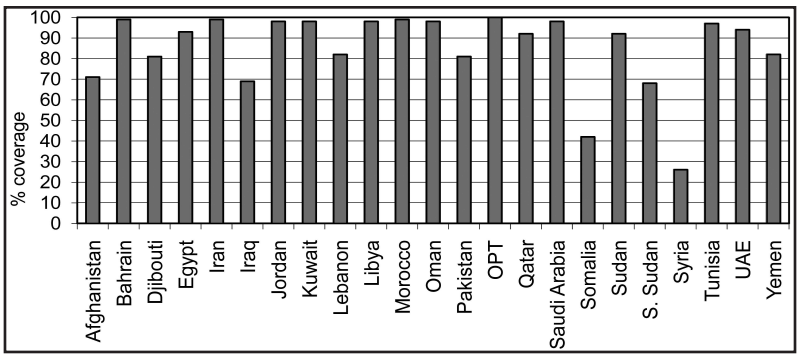

Figure 1.WHO-UNICEF estimates of DPT3 coverage in countries of the Eastern Mediterranean Region, 2012

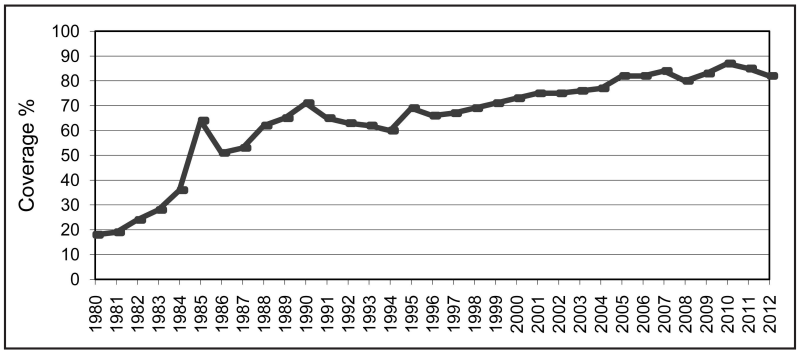

Figure 2. WHO-UNICEF estimates of DPT3 coverage in the Eastern Mediterranean Region, 2012

Despite the progress, around 3 million infants did not receive their third dose of DPT vaccine in 2012; around 92% of these children are from 7 countries (Figure 3). Even in the countries that report high routine coverage, there are issues of inequity, with a considerable proportion of the districts not achieving the 80% target of DPT3 coverage.

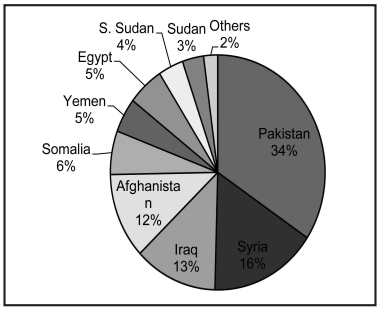

Figure 3. Distribution of 3 million unvaccinated children in the Region in 2012

Immunization programmes in the Region face several constraints. These include inadequate structure and managerial capacity of immunization programmes in some countries, competing priorities , inability to respond to the increasing requirement of immunization programmes to meet the set target of disease control, elimination and eradication; weaknesses of the surveillance, monitoring and evaluation systems and the quality of vaccination coverage data and failure to use the data for adequate planning and evaluation. These factors and the emergency and security situations in an increasing number of countries constitute a major challenge that contributed to the drop of the DPT3 vaccination coverage from 87% in 2010 to 82% in 2012.

3.3 Measles elimination:

In 1997, the forty-fourth Session of the Regional Committee (RC) for the Eastern Mediterranean adopted a resolution to eliminate measles from all countries of the Region by 2010 (EM/RC44/R.6)[10].

Regional strategies to reach measles control and elimination targets

1. Achieving high population immunity through

a) Achieving high routine vaccination coverage (95% coverage in all districts) with 2 doses of measles vaccine among all birth cohorts

b) Timely implementation of measles follow up

supplementary immunization activities (SIAs) in all countries that have measles routine vaccination coverage below the required level (95% coverage with 2 doses of measles vaccine in all districts)

2. Strong case-based laboratory-based surveillance for measles;

3. Optimal measles case management

The Region has made substantial progress towards achieving the target of measles mortality reduction and elimination. All countries have implemented nationwide catch up campaign and more than 367 million people in the Region were vaccinated through supplementary immunization activities (catch up and/or follow-up campaigns) between 2000 and 2012. The regional average of MCV1 coverage reached 83% in 2011. All countries have moved to case-based measles surveillance with laboratory confirmation. As a result, measles mortality was reduced by 93% between 2000 and 2008 and the reported number of confirmed measles cases decreased from about 88 000 in 1998 to 10 517in 2010. Ten countries are moving towards measles elimination (figure 4)[11].

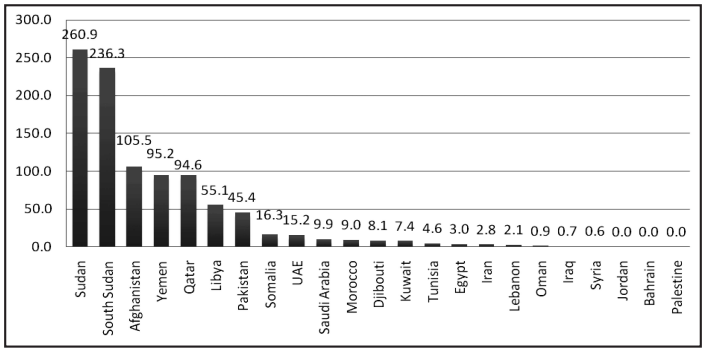

Figure 4: Measles incidence rate/million in EMR, 2012

However, the Region did not achieve the target of measles elimination by 2010 and the gain of measles mortality reduction was lost in several countries with the occurrence of huge epidemics of measles in Afghanistan, Pakistan, Somalia, Sudan and Yemen during 2009-2012. In view of this situation, the Regional Committee of the Eastern Mediterranean in its 58th session in 2011, have decided to postpone the target of measles elimination to 2015 (EM/RC58/R.5). Achieving measles elimination requires reaching a very high and sustained level of measles population immunity through high routine vaccination coverage (95%) with 2

doses of the vaccine and timely implementation of the follow-up campaigns where needed. Resurgence of measles in several countries after achieving remarkable reduction is due to the accumulation of susceptible children as a result of the relatively low routine vaccination coverage and delayed implementation of the follow up SIAs, due mainly to inadequate funding, which resulted in accumulation of susceptible children. Implementation of low quality SIAs that did not reach the required vaccination coverage contributed significantly to occurrence of the outbreaks in some countries. National ownership and allocation of necessary government resources and ensuring high quality of the SIAs are mandatory. The continuous support of the international partners is essential. The tremendous financial support of the Measles-Rubella initiative which has been provided to low income countries of the region, together with the new Global Alliance for Vaccine and Immunization (GAVI) window for supporting measles SIAs in some countries, constitutes an opportunity.

3.4 Introduction of new vaccines:

Pneumococcal, Hib and rotavirus diseases together cause around 17% of the deaths among children under five years in the EMR and up to 20% of these deaths in some countries of the region in the absence of vaccination (Table 1). Thanks to GAVI support to the GAVI eligible countries and government commitment in other countries, new vaccines introduction in the Region gained momentum during the past few years. So far, Hib vaccine has been introduced in 20 countries (Egypt, Iran and South Sudan are pending introduction). Pneumococcal conjugate vaccine (PCV) has been introduced in 12 countries [6 Gulf Cooperation Council (GCC) countries in addition to Djibouti, Morocco, Pakistan, Palestine, Sudan and Yemen] while rotavirus vaccine has been introduced in 7 countries (Bahrain, Qatar, Iraq, Morocco, Saudi Arabia, Sudan and Yemen). The percentages of children born in countries that offer Hib, PCV and rotavirus vaccine in 2013 are shown in Figure 5.

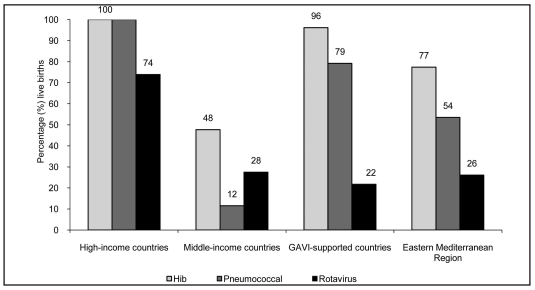

Figure 5. Proportion of live births born in countries which have included new vaccines in their national EPI, August 2013

Nevertheless, uptake of these vaccines in the Region is considered generally slow, especially in the middle-income countries. After 20 years of availability of Hib vaccine, 23% of the infants in the EMR are born in countries that do not offer Hib vaccine. Moreover, 47% and 74% of the infants in the region are born in countries that have not included pneumococcal and rotavirus vaccine in the national immunization program respectively.

The slow uptake of the new vaccines in the region is attributed mainly to the high prices of these vaccines, along with inadequate allocation of the necessary resources, inadequate decision-making capacity and lack of awareness of disease burden, and the inadequate procurement systems in some countries. Children living in high-income countries are able to access these vaccines, as are children in the GAVI support-receiving countries. However, infants in middle-income countries, especially the low middle-income countries, seem less likely to have this chance in the near future.

To enhance introduction of the new vaccines in EMR countries, WHO supports strengthening the institutional decision-making capacity, through supporting establishing and strengthening the National Technical Advisory Groups (NITAGs) and establishing Regional networks for surveillance of diseases preventable by new vaccines that aims at generating reliable data on burden of these disease to allow evidence-based decision-making. Establishing a regional pooled vaccine procurement system in the Region is expected to enable the supply of high quality competitively priced vaccines to countries which will be part of the system.

4. Challenges and constraints facing immunization programs:

- Emergency and security situations in an increasing number of countries.
- Competing priorities in the presence of weak health systems and inability to respond to the increasing requirement of immunization programmes to meet the set target of vaccine-preventable disease control, elimination and eradication as well as introduction of new vaccines.
- Inadequate structure, technical and managerial capacity of the immunization programs in some countries, in terms of both number and qualification of EPI staff at central and peripheral levels.
- Increasing financial demands of the immunization programs with inadequate government financial allocation, threatening the gains

of the immunization programs.

- Perception by decision-makers that, having achieved high routine vaccination coverage, EPI is a "finished agenda", without regard to the increasing needs of the immunization programs to sustain the success and address competing priorities, which include introduction of new vaccines, meeting the requirements of disease eradication and elimination, and expansion of immunization to older age groups
- Weak surveillance systems for vaccine-preventable diseases, including diseases preventable by new vaccines, and weak EPI monitoring and evaluation systems.
- Inadequate social mobilization and failure in creating adequate community demand for vaccination in low coverage countries.

5. Scaling up immunization programs to achieve the regional and national targets:

In view of the situation of the immunization programs in the region and the need to scale up the immunization programs to achieve the regional and national targets, the Regional Committee (RC) of the Eastern Mediterranean, in its 58th session in 2011, passed the resolution EM/RC58/R.5 where-by the RC:

1. URGES *Member States to:*

1.1 Review and strengthen the structure and managerial capacity of the national immunization program at all levels.

1.2 Strengthen national vaccine-preventable disease surveillance, including surveillance for adverse events following immunization, and monitoring and evaluation of the national immunization program.

1.3 Allocate necessary resources for proper implementation of the regional strategy for measles elimination in order to achieve elimination by 2015.

1.4 Mobilize the resources necessary to introduce pneumococcal conjugate vaccine, Hib conjugate vaccine and rotavirus vaccine as soon as possible.

1.5 Continue to implement the annual Vaccination Week in the Eastern Mediterranean Region and use this campaign as an opportunity to promote the value of immunization.

1.6 Participate in the establishment of a regional pooled vaccine procurement system.

2. REQUESTS *the Regional Director to:*

2.1 Continue to provide technical support to Member States in their efforts to strengthen the technical and managerial capacity of the national

immunization program and to introduce new vaccines.

2.2 Support and develop on-going collaborative activities with the various agencies extending support to national immunization programs, in order to ensure maintenance of the current achievements in the Region.

2.3 Promote the establishment of a regional pooled vaccine procurement system, and

2.4 Facilitate transfer of technology for production of vaccines.

References:

1.Eastern Mediterranean Region Of the World Health Organization include 23 countries:

Afghanistan, Bahrain, Djibouti, Egypt, Iraq, Iran, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Occupied Palestinian Territories, Qatar, Saudi Arabia, Somalia, South Sudan, Sudan, Syria, Tunisia, United Arab Emirates and Yemen.

2.http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragebcg.html

3.http://www.who.int/immunization_monitoring/data/Summary_Measles_SIAs_2000_2012.xls

4.Black RE et al. Global, regional and national causes of child mortality in 2008: a systematic analysis. The Lancet. Published online May 12, 2010 DOI:10.1016/S0140-6736(10)60549-1

5.Black RE et al. Global, regional and national causes of child mortality in 2008: a systematic analysis. The Lancet. Published online May 12, 2010 DOI:10.1016/S0140-6736(10)60549-1

6.The component strategies. World Health Organization, Geneva, 2006. Accessed on 27 June 2011.http://www.who.int/immunization/givs/GIVS_strategies.pdf

7.Rotavirus disease: WHO unpublished estimates for 2008.Hib and pneumococcal disease: http://www.who.int/immunization_monitoring/burden/Pneumo_hib_estimates/en/index1.html

8.http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragebcg.html

9.http://apps.who.int/immunization_monitoring/globalsummary/timeseries/tswucoveragebcg.html

10.Measles elimination: The absence of endemic measles transmission in a defined geographical area (e.g. region) for a period of at least 12 months or more, in the presence of a well-performing surveillance system.

11.Source: countries official reports to WHO/EMRO

MALARIA BURDEN IN ISLAMIC COUNTRIES

Mustafa Idris Elbashir *

Abstract:

After more than 100 years of its discovery, malaria remains a leading cause of morbidity and mortality worldwide. The last decade of the 20th century was witness to the international community becoming increasingly aware of the malaria burden to large parts of the world, with 300-500 million clinical cases, and approximately one million deaths occurring each year. It is a threat to about 3 billion peoples in the third world, the majority of whom live in Islamic countries.Nonetheless, several stakeholders have joined forces at the turn of the century to contain the malaria tragedy, including World Health Organization (WHO), World Bank, Funding Agencies such as Bill Gates and Malend Foundation, private sector and a handful of specialized bodies. The combined efforts of these bodies are directed to proper description of the problem, design and evaluation of new control strategies, design and development of new drugs, better understanding of the biology of the parasite, the immunity it induces in the human host, and development of effective candidate vaccines. Appreciable financial support has been obtained during the last decade and significant improvement achieved in the prevalence of malaria by impowering, training and mobilizing local communities. Unfortunately, these efforts are hampered by political in stability and war especially in Islamic countries. Non Governmental Organiaons (NGOs) in the Islamaic World,especially those medically oriented, can make real impact in the fight against malaria if they are engaged with clear vision and flexible mandate form local authorities.

Keywords: Malaria, malaria parasite, epidemiology, Malaria control, malaria treatment, malaria vaccines.

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Introduction:

Despite more than 100 years since Laveran described Plasmodium species and Ross confirmed that they were transmitted by female anopheline mosquitoes, malaria remains a leading cause of morbidity and mortality worldwide. Malaria is a parasitic disease transmitted to humans by *Anopheles* mosquitoes. Among the five species of parasites that affect humans *(P. falciparum, P. vivax, P. ovale, P. malariae* and *P. knowlesi),* malaria due to *P. falciparum* is the most deadly,and it predominates in Africa. *P. vivax* is less dangerous but more widespread, and the other three species are found much less frequently. Malaria is transmitted to humans by the bite of infected female mosquitoes of more than 30 anopheline species [1].

Malaria is the world's most important parasitic infection ranking among the major health and developmental challenges. The ecological conditions that support the more efficient malaria mosquito vectors to multiply primarily determine the distribution and intensity of the disease.Despite years of continued efforts, malaria is still one of the major causes of morbidity and mortality affecting the developing countries and still a threat to over 3 billion people, representing approximately 40% of the world's population [1].

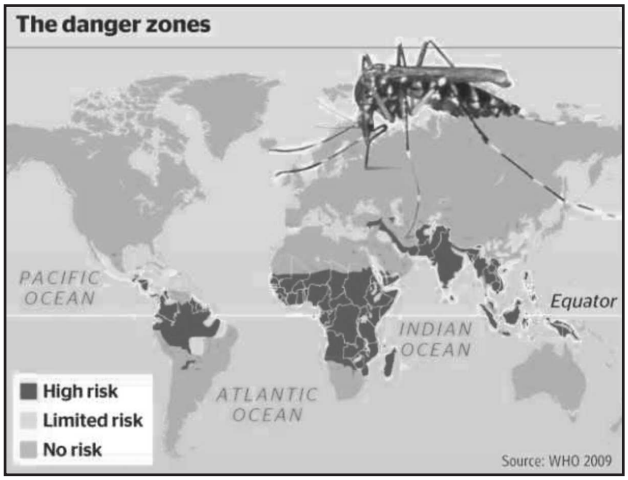
Geographical distribution of the disease is worldwide, being found in tropical areas, throughout sub-Saharan Africa, Southeast Asia, the Pacific Islands, India, Central and South America. It is endemic in more than 100 countries and almost more than half of them are in the Islamic World, as can be seen in maps 1 and 2.The malaria condition is worsening in some African and South Eastern Asian Muslim countries due to political instability and civil war (Maps 1, 2 and 3). Political instability and civil war destroy the infrastructure including health facilities which are necessary for the prevention and treatment of the disease. This may result in deadly epidemics e.g. the recent situation of Myanmar (Burma)[2]. Another example is the situation of Somalia where millions of Muslims have been deprived of basic health services due to the unstable political situation in the country.However, recent attempts are being made to reconstruct the health sector, in particular to estimate the extent of infectious disease burden [3]. The same scenario can be observed in Sudan, Iraq and Afghanistan[4,5].

Plasmodium falciparum causes the most lethal form of malaria, with 300-500 million clinical cases and approximately one million deaths occurring each year. The malaria burden differs according to the transmission intensity, health infrastructure, age and gender. In sub-Saharan Africa where malaria is endemic, children and pregnant women, especially primigravidae, are

the major vulnerable groups and *P. falciparum* malaria kills one of every 20 children before the age of five[6].

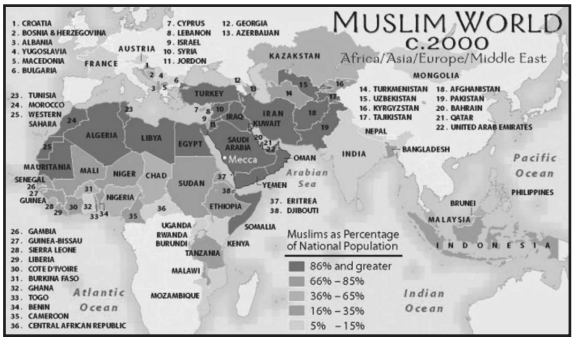
Macroeconomic projections show that the costs are far greater than the costs of individual cases, with a substantial deleterious impact of malaria on schooling , external investments into endemic countries, and tourism. Malaria and poverty are intimately connected. Poor populations are at greatest risk; 58% of the cases occur in the poorest 20% of the world's population, the majority in the Islamic World, and these patients receive the worst care and have catastrophic economic consequences from their illness [7].
During the eradication era, half a century ago, malaria was eliminated or effectively suppressed in many parts of the world, particularly subtropical regions.Countries that have eliminated malaria in the past half century have all been either subtropical or islands. These countries' economic growth in the 5 years after eliminating malaria has usually been substantially higher than growth in the neighboring countries. Intensive efforts to eliminate malaria in the most severely affected tropical countries have been largely ineffective [8].

An increasing number of imported cases of malaria have been reported particularly as a result of increasing worldwide travel to regions where there is ongoing risk of malaria transmission. Nowadays, cases of malaria acquired by international travelers from developed countries probably number 25,000 cases per year, with approximately 150 deaths per year.

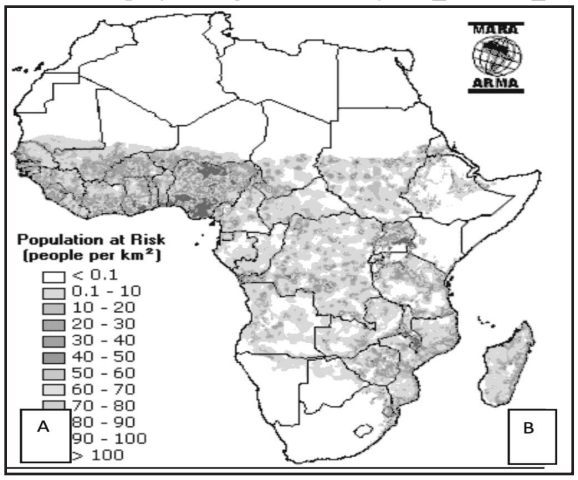


Map 1: Malaria endemic areas of the world
http://www.thetimes.co.uk/tto/health/news/article2997421.ece

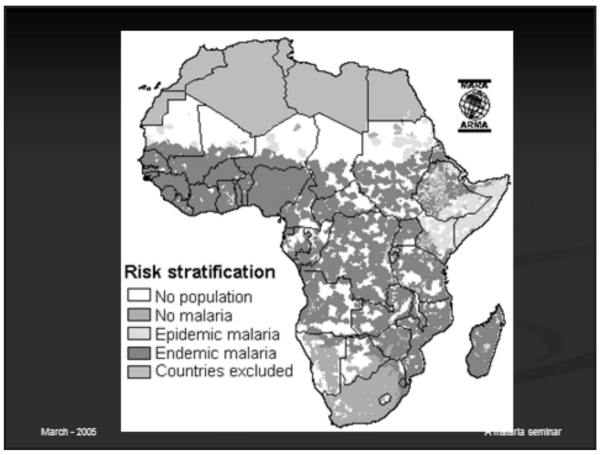
Malaria is an entirely preventable and treatable disease,provided that currently recommended interventions are properlyimplemented. These include (i) vector control through the use of insecticide-treated nets (ITNs), indoor residual spraying (IRS) and,in some specific settings, larval control; (ii) chemoprevention for the most vulnerable populations, particularly pregnant women and infants; (iii) confirmation of malaria diagnosis through microscopy or rapid diagnostic tests (RDTs) for every suspected case, and(iv) timely treatment with appropriate antimalarial medicines according to the parasite species and any documented drug resistance[9].



Map 2 Muslim World in malaria belt
http://www.islamproject.org/education/Africa_Mideast_etc.html



A.http://www.loonwatch.com/tag/africa/
B.*http://www.afro.who.int/en/clusters-a-programmes/dpc/malaria.html*



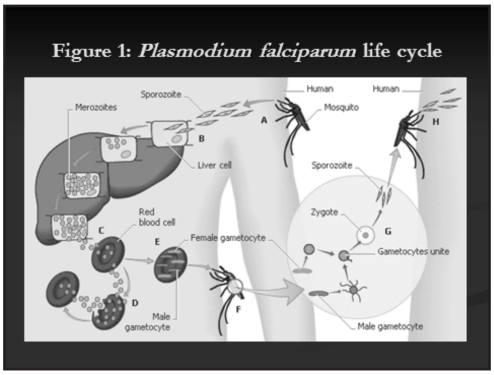
Map 3 African Muslims and the malaria zone
http://qed.princeton.edu/main/Image:Risk_of_Malaria_in_Africa

Life cycle of the malaria parasite:
(figure 1)

The life cycle is shared between a mosquito vector and a human host. Infection begins when (A) sporozoites, the infective stages, are injected by a mosquito and are carried around the body until they invade the hepatocytes where (B) they undergo a phase of asexual multiplication (exoerythrocytic schizogony) resulting in the production of many uninucleate merozoites. These merozoites flood out into the blood and invade red blood cells where (C) they initiate a second phase of asexual multiplication (erythrocytic schizogony) resulting in the production of about 8-16 merozoites which invade new red blood cells. This process is repeated almost indefinitely and is responsible for the disease, malaria. As the infection progresses, some young merozoites develop into male and female gametocytes that circulate in the peripheral blood until they are (D) taken up by a female anopheline mosquito when it feeds. Within the mosquito (E) the gametocytes mature into male and female gametes, fertilization occurs (F) and a motile zygote (G) is formed within the lumen of the mosquito gut, the beginning of a process known as sporogony. The ookinete penetrates the gut wall and becomes a conspicuous oocyst within

which another phase of multiplication occurs resulting in the formation of sporozoites that migrate to thesalivary glands of a mosquito and are injected when the mosquito feeds on a new host (H)

countries in the African Region and 53 of 63 endemic countries in other WHO Regions reported having adopted a policy ofproviding parasitological diagnosis for all age groups. The number of RDTs supplied by manufacturers increased



Map 4 Malaria life cycle
http://allaboutchris.org/blog/tag/malaria/

Malaria diagnosis and treatment:

Traditionally malaria is diagnosed by microscopy. The number of Rapid Diagnostic Tests (RDTs) procured is increasing recently, and the percentage of reported suspected cases receiving a parasitological test has also increased, from 67% globally in 2005 to 73% in 2009. Many cases still are treated presumptively without a parasitological diagnosis.Prompt parasitological confirmation by microscopy or RDT is recommended for all patients with suspected malaria, before treatment is started. In 2010, 37 of 43 malaria-endemic

from 45 million in 2008 to 88 million in 2010. Product testing has shown an improvement in test quality over time, and proportionally more high quality tests are being procuredover time; nearly 90% of RDTs procured in 2011 had panel detection scores of more than 75%, compared with only 23% of RDTs procured in 2007.The percentage of reported suspected malaria cases receiving a parasitological test has increased between 2005 and 2010, particularly in the African Region (from 26% to 45%), EasternMediterranean Region and South-East Asia (60% to 91%) [9].

In the light of spreading resistance to most available antimalarial drugs,

confirmed cases of uncomplicated *P. falciparum* malaria should be treated with an Artemethinin Combination Therapy (ACT) as recommended by WHO. In 2011, 84 countries and territories had adopted ACT for first-line treatment of *P. falciparum* malaria, representing an increase from 77 countries in 2010. Artemisinin-based combination therapy (ACT) for malaria is rapidly gaining acceptance as an effective approach for countering the spread and intensity of *Plasmodium falciparum* resistance to chloroquine,sulfadoxine/pyrimethamine, and other antimalarial drugs. Although costly,($1.20-2.50 per adult treatment)ACT becomes more cost-effective as resistance to alternative drugs increases; early use of ACT may delay development of resistance to these drugs and prevent the medical toll associated with use of ineffective drugs. Artesunate-sulfadoxine-pyrimethamine remains effective in thecountries using this combination as a first-line treatment. Thisincludes countries in the Middle East, South and Central Asiaand the Horn of Africa. Failure rates remain high in regionswhere resistance to sulfadoxine-pyrimethamine is high [10].

Data on the therapeutic efficacy of dihydroartemisininpiperaquine are limited and come mainly from studies carried out in parts of Africa and in the Greater Mekong sub-region.More studies are needed before drawing conclusions about its overall efficacy in endemic countries. In 2009 and 2010, therapeutic drug efficacy studies detected suspected artemisinin resistance in western Thailand and south-eastern Myanmar, and in one province in Viet Nam, asevidenced by ⩾ 10% of cases with parasites detectable on day 3 after treatment with an ACT. Day 3 parasite detection is one of earliest signs of potential artemisinin drug resistance. Containment activities have begun in Thailand along the Myanmar border, in south-eastern Myanmar and in Viet Nam. Although the observations suggest that there are changes in parasite sensitivity to artemisinins, ACTs remain clinically and parasitologically effective, except in Pailin province, Cambodia. In Pailin, resistance to both components, artesunate and mefloquine, of a commonly used ACT have been confirmed, and resistance to piperaquine is under investigation after a study in 2010 found 27% treatment failure with dihydroarteminin-piperaquine. Many aspects of artemisinin resistance are still not well understood and more research is needed, e.g. the importance of non-artemisinin component drugs in ACTs needs further clarification. The partner drugs usually have a longer half-life than the artemisinin component,and therefore complement and extend the therapeutic efficacy of the combination. Indiscriminate use of ACTs in patients who do not have malaria risks not only the development of artemisinin resistance but potential failure of the

partner drug as well. This is a matter of high concern since we have only few effective drugs left and malaria is the disease of poor nations. Thus, pharmaceutical companies show little interest in antimalarial drug development [11].

Treatment of *P. vivax* malaria: Chloroquine remains the drug of choice in areas where chloroquine is still effective. Treatment failure on or before day 28 and/or prophylactic failures have been observed in Afghanistan, Brazil, Cambodia, Colombia, Guyana,Ethiopia, India, Indonesia, Madagascar, Malaysia, Myanmar,Pakistan, Papua New Guinea, Peru, the Republic of Korea, Solomon Islands, Thailand, Turkey, Sri Lanka, Vanuatu and VietNam.
ACTs are now recommended for the treatment of chloroquine-resistant *P. vivax*, particularly where ACTs have been adopted as the first line treatment for *P. falciparum*.Treatment of *P. vivax* should be combined with a 14-day course of primaquine to prevent relapse.

Antimalarial drug resistance:

One of the threatening problems in malaria control is the fact that the parasites are becoming resistant to most available drugs especially in South East Asia and Africa where majority of Muslims live . Resistance of *P. falciparum* to chloroquine, the cheap and commonly used for decades, appears to have emerged in South East Asia in the early 1960s and evidence of resistance to the combination of sulfadoxine and pyrimethamine and to the combination of diaphenylsulfone and pyrimethamine came from the same area towards the end of the same decade. The factors leading to the emergence and increase of drug resistance appear to have been: the continuous introduction of non-immune migrants to a hyperendemic malaria area, an increase in already intense transmission resulting from the living and working conditions of the migrants and prolonged drug pressure resulting from individual drug consumption and mass drug administration, particularly from the medicated salt project which covered the area in which resistance emerged. These conditions lead to the selection of resistant mutants [12].

Moreover, resistant parasites were exposed to multiple and increasing doses of chloroquine, pyrimethamine and sulfathiazole during repeated passages through non-immune hosts who were being treated for primary attacks, early recrudescences and reinfections. This probably resulted in increasing the degree of resistance and in the selection of parasites resistant to sulfathiazole with cross-resistance to other sulfonamides. In Irian Jaya, Indonesian New Guinea, where there had been a chloroquinized salt project, the level of chloroquine resistance was much lower than in Païlin; this is associated with the absence of a non-immune population and the lower dose of chloroquine base used in the salt.

At first, resistance was found only in three foci in SouthEast Asia where *A. balabacensis* is the vector of malaria. It then spread to all *A. balabacensis* areas, and finally to areas outside the area of distribution of *A. balabacensis*. The spread of resistance is found to be favoured by the presence of the vector *A. balabacensis* and by the introduction of a non-immune population [12].

The emergence of *Plasmodium falciparum* resistance to widely used antimalarial drugs such as chloroquine (CQ) has made malaria control and treatment much more difficult. This is particularly dramatic for Africa, as few affordable alternatives are available. Drug pressure has been identified as one of the key factors for the emergence and spread of resistance. The contribution of the extensive use and misuse of antimalarial drugs to the selection of resistant parasites became particularly evident during the Global Malaria Eradication campaign, launched by WHO in 1955. The first reports confirming *P. falciparum* resistance to CQ came almost simultaneously in the early 1960s from South America and South-East Asia, where direct or indirect (through use of medicated cooking salt) mass drug administration (MDA) had been implemented. Similar approaches were very limited in Africa, where *P. falciparum* resistance to CQ was first reported from the eastern region in the late 1970s and spread progressively west. Most African countries still rely heavily on CQ as first-line treatment despite various levels of resistance, although some states have changed to sulphadoxine-pyrimethamine (SP) as the first-line drug.

The geographical distribution of *P. falciparum* strains resistant to proguanil and pyrimethamine is not well known. Chloroquine-resistant strains are found in South East Asia, the Amazon region (almost 100% resistance in both regions) and in Africa south of the Sahara (resistance not everywhere 100%). Sulfadoxine-pyrimethamine is not an effective treatment in South East Asia and the Amazon region; it is useful in tropical Africa. Mefloquine resistance is a problem mainly confined to Thailand. There is cross resistance between halofantrine and mefloquine. Decreased sensitivity to quinine was reported from Thailand, but it remains an effective drug, notably when given in combination with tetracycline or doxycycline. In cases of severe or complicated malaria intravenous quinine is still the preferred therapy [13].

Unfortunately, the predicted SP useful therapeutic life might be very short, probably because of its prolonged half-life, causing a higher probability of selecting resistant strains and a consequent fast development of resistance. CQ resistance is not evenly distributed and important differences can be found within and between countries. It seems to have spread more rapidly

in East than in West Africa. Considering the high level of CQ use in West Africa, other factors such as intensity of transmission, population immunity or population movements should be considered when explaining the different levels of resistance. Understanding such factors may help us in devising strategies to contain the spread of drug resistance [13].

WHO recommends that oral artemisinin-based monotherapies be withdrawn from the market and replaced with ACTs. Unfortunately many countries were still allowing the marketing of these products. Most of the countries that still allow the marketing of monotherapies are in the African region, while most of the manufacturers are in India.Therapeutic efficacy studies remain the gold standard for guiding drug policy and should be undertaken at least every 2 years. Suspected resistance to artemisinins has now been identified in four countries in the Greater Mekong subregion: Cambodia,Myanmar, Thailand and Viet Nam. Containment efforts have shown that a reduction in malaria incidence, a key component of the overall containment plan to halt the spread of resistant parasites, can be achieved.

Despite the observed changes in parasite sensitivity to artemisinins, the clinical and parasitological efficacy of ACTs remains high in most settings.However, high treatment failure rates to several ACTs, in particular to dihydroartemisinin-piperaquine which is one of the newest ACTs, has already been identified in Pailin province in Cambodia. This highlights the need for vigilance not only to protect the efficacy of artemisinins, but also the partner medicines in the drug combinations.In 2011 WHO published the Global Plan for ArtemisininResistance Containment (GPARC), which recommends five key activities for successful management of artemisinin resistance:stop the spread of resistant parasites; increase monitoring and surveillance to evaluate the threat of artemisinin resistance;improve access to diagnostics and rational treatment with ACTs; invest in research related to artemisinin resistance; and motivate action and mobilize resources [14].

Since malaria is a disease of poor nations, pharmaceutical companies show little interest in antimalarial drug development. This is a matter of high concern in view of the increasing drug resistance.

Malaria control:

The failed attempt to eradicate malaria gave way to the control policy that was followed by a huge resurgence of malaria during the late 70s and 80s.Together with the emergence and spread of resistance to chloroquine and the weak health infrastructure in many of the endemic countries, particularly in Africa, the

malaria situation worsened worldwide. Many established malaria control methods are hampered by drug resistance and insecticide-resistant vectors. However, malaria control measures built around environmental management are non-toxic, cost-effective, and sustainable. Evidence over the past century is that successful malaria control programs have been linked to strong research activities. Several studies dealing with environmental modification using measures aiming to create a permanent or long-lasting effect on land, water, or vegetation to reduce vector habitats--eg, the installation and maintenance of drains, environmental manipulation using methods creating temporary unfavourable conditions for the vector--eg, water or vegetation management, and the effect of modifications of human habitation were all shown to be successful [15].

To ensure effective coordination and cooperation between the growing number of research and control coalitions forming in support of malaria control activities, an umbrella group is needed. The WHO in collaboration with international, continental and regional partners, advocates and provides normative guidance and technical assistance for the scale-up of essential interventions in order to reverse the incidence of malaria by 2015. For this purpose the Roll Back Malaria (RBM) iniative was first announced in May 1998. Its ambitious goal is halving the current malaria burden by the year 2010 and again 5 years later [15].RBM provided continued support for scientists and control workers globally, particularly in low-income countries where malaria is prevalent.Access to services, prevention, treatment interventions, procurement and supply of quality medicines and commodities, diagnostic capacity; routine surveillance, monitoring and evaluation had all improved.

There are four central features which distinguish RBM from the former attempts to eradicate malaria. First, emphasis is placed on malaria control instead of eradication. Second, the main focus is on sub-Saharan Africa, whereas prior interventions were mainly targeted to the Americas, Asia and endemic areas of Europe [1]. Third, it is a global partnership between development agencies, banks, the private sector, NGOs, foundations and a network of researchers. Fourth, it follows a horizontal approach and promotes the strengthening of local capacities and health systems, so that malaria can be dealt with locally [16].

The financing provided for malaria control through RBM has enabled endemic countries to greatly increase access to insecticide-treated mosquito nets (ITNs); the percentage of households owning at least one ITN in sub-Saharan Africa is estimated to have risen from 3% in 2000 to 50% in 2011, while the percentage protected by indoor residual spraying (IRS) rose from less than 5% in 2005 to 11%

in 2010. Household surveys indicate that 96% of persons with access to an ITN within the household actually use it. The number of rapid diagnostic tests (RDTs) and artemisinin-based combination therapies (ACTs) procured is increasing, and the percentage of reported suspected cases receiving a parasitological test has also increased, from 67% globally in 2005 to 76% in 2010, with the largest increase in sub-Saharan Africa. Despite this significant progress, however, more work is needed before the target of universal access is attained.As a result of the scale-up of use of insecticide-treated nets, indoor residual spraying, intermittent preventive treatment (IPT) during pregnancy and Artemisinin-based combination therapy, 10 countries in the WHO African region have reduced malaria cases by at least 50% between 2000 and 2008 [9,17].

The year 2010 was an important milestone on the way to achievement of internationally agreed goals and targets for malaria control. The year 2010 was the date set to achieve universal coverage for all populations at risk of malaria using locally appropriate interventions for prevention and case management, and to reduce the malaria burden by at least 50% compared to the levels in the year 2000.In the light of progress made by 2010, the Roll Back Malaria(RBM) targets were updated in June 2011. The targets are now to: (i) reduce global malaria deaths to near zero by end-2015;(ii) reduce global malaria cases by 75% from 2000 levels by end-2015; and (iii) eliminate malaria by end-2015 in 10 new countries since 2008 where malaria has been eliminated from 10 countries [10], including in the WHO European Region.These targets will be met by: achieving and sustaining universal access to, and utilization of, preventive measures; achieving universal access to case management in the public and private sectors and in the community (including appropriate referral);and accelerating the development of surveillance systems [10].

Financing malaria control:

The World Malaria Report 2011 summarizes information received from 106 malaria-endemic countries and other sources and updates the analyses presented in the 2010 report. It highlights continued progress made towards meeting the international targets for malaria control set for 2010 and 2015 [9].International funding for malaria control has continued to rise, to a peak of US$ 2 billion in 2011. The amounts committed to malaria, while substantial, still fall short of the resources required to reach malaria control targets, estimated at more than US$ 5 billion per year for the years 2010–2015. Reductions in reported malaria cases of more than 50% have been recorded between 2000 and 2010 in 43 of the 99 countries with ongoing transmission, while downward trends of 25%–50% were

seen in 8 other countries. The estimated global incidence of malaria has been reduced by 17% since 2000 and malaria-specific mortality rates has been reduced by 26%. These rates of decline are lower than the internationally agreed targets for 2010 that is 50% reductions. But nonetheless, they represent a major achievement [9]. If just 1% of total domestic spending were made available for malaria control, 75 of the 99 countries with ongoing malaria transmission could raise enough to provide each person at risk with access to an ITN.

Involvement of NGOs in Malaria control:

NGOs, especially those with medical background, can make appreciable contribution in the fight against malaria .The strategic approaches to malaria control come within two major domains: (i) prevention and (ii) case management. Together,these strategies work against the transmission of the parasite from mosquito vector to humans, and the development of illness and severe disease. NGOs can have great role in both, especially prevention. There are good lessons from the experience of RBM. Mobilizing local communities, especially youths, providing them with basic training and tools, has been successful in the fight against malaria.Very simple procedures at the level of the community can cut down the malaria transmission in the area. The Sudanese Red Crescent Society had good experience in training vulnteers from within the community to raise the awareness of the malaria threat among people in the internally displaced camps around Khartoum. NGOs also can establish specialized malaria clinics and make reference laboratories as the experience of Sudan Islamic Medical Association (SIMA) has shown. That project has been established in the mid 90s in collaboration with Asian Medical Doctors Association(AMDA). It provided medical service; clinical and laboratory free to malaria patients.

Malaria vaccines:

The malaria parasite developed resistance against most of the available antimalarial drugs . One of the approaches to fight malaria is to develop vaccines.Experts say a malaria vaccine might offer the greatest hope of achieving significantly improved malaria control, particularly in Africa, where the ecological habitat is such that effective mosquito control has proved difficult or impossible to maintain.

Problems with vaccines is that malaria pathogenesis is not well understood and the parasite has a complex life cycle, asexual and sexual stages, that occur in the human host and the mosquito vector. In the human host there are different stages in different organs with different set of antigens expressed on the surface of infeted red blood cell (IRBC). Even

for a single antigen there is, sometimes, considerable polymorphism. However, repeated or prolonged exposure to malaria infection ultimately leads to the development of clinical immunity such that, despite remaining susceptible to infection, parasite replication is controlled and the infection is eliminated without the development of clinical signs and symptoms. Effective immunity to malaria has been clearly demonstrated among individuals naturally exposed to malaria , it is complex, and is essentially both species and stage specific. It is regulated by the synchronized action of the innate and adaptive immune systems in addition to environmental factors although the relative importance of each remains unclear . The cellular arm of the immune system is considered more important in controlling liver-stage infections, although antibodies contribute to protection; humoral immune mechanisms may be more important in controlling the blood stages. Immunity to malaria is only partial and it is rarely sterile, but it is associated with low-grade parasites via an episode of clinical disease through life or at least as long as the individual remains continuously in the endemic area [18-20].

Progress in malaria vaccine research has been substantial over the past five years.Thirty five candidate malaria vaccines are in development, many of which are in clinical trials. Before a malaria vaccine becomes deployed, consideration must be given to disease burden, cost-effectiveness, financing, delivery systems, and approval by regulatory agencies. Key to evaluation of vaccine effectiveness will be collection and prompt analysis of epidemiologic information [21-35].

A vaccine that has raised hopes of becoming a potent new tool in the battle against malaria seems to stop working in children after four years, according to new research.The vaccine candidate known as RTS,S is not yet on the market, but ongoing trials in seven African countries generated hope that it might help slow new malaria cases as drug resistance to the deadly parasite grows.The latest data comes from a phase II follow-up study on 320 children in Kenya which found that in the first year after vaccination, protection against malaria was 43.6 percent, but that dropped to zero by the fourth year.It also found that the more often a child was exposed to malaria, the less effective the vaccine appeared to be.The vaccine's efficacy was 45.1 per cent in children with below-average exposure to malaria, but just 15.9 per cent in children with above-average exposure.Despite the falling efficacy over time, there is still a clear benefit to the vaccine candidate[35].

Currently there are ongoing field trials on another malaria candidate vaccine in 11 sites in seven countries in Africa. The name of that vaccine is RLTSS and preliminary results have shown efficacy in different age

groups and with 55 per cent efficiency in preventing malaria. If we consider the number of cases of malaria annually, the public health benefit of that could be amazing. Most vaccines available stimulate antibodies but this vaccine does not work that way, it stimulates T cells as opposed to antibodies [36].

The WHO recently reported that these trials are showing remarkable progress, with signals that the world might have its first successful malaria vaccine by the year 2015 [37].

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THE PERMISSIBILITY OF USING ROTAVIRUS VACCINES LESSONS FROM ORAL POLIOVIRUS VACCINES

Musa Bin Mohd Nordin*

Abstract:

Rotavirus gastroenteritis is responsible for 527,000 deaths in children less than five years old and considerable morbidity leading to millions of hospitalizations and clinic visits each year. Most of these occurring in developing countries in Africa and Asia. The rotavirus vaccine, available since 2006, has been shown to be life saving, efficacious, safe and cost effective.

The use of porcine trypsin in the manufacturing process of rotavirus vaccines has raised concerns in some quarters. This is not a new issue and has been previously addressed by Muslim physicians, scientists, public health experts and jurists in relation to the Oral Polio Virus vaccine which utilizes a similar technology in its manufacturing process.

This precedent from an earlier *fatwa* issued by the European Council of Fatwa and Research (ECFR) reassures the Muslim community on the permissibility of the use of both the Oral Polio Virus and Rotavirus vaccines.

Keywords:

Rotavirus vaccines, gastroenteritis, oral polio vaccine, Islamic Jurisprudence.

Introduction:

Pneumonia and diarrheal disease are the two top killers of children. United Nations International Cultural and Educational Foundation (UNICEF) and World Health Organization (WHO) reports that these two diseases kill more than 2 million children each year. They make up 29% of childhood deaths under the age of 5 worldwide[1].

Poor sanitation, insufficient water treatment systems, lack of access to appropriate medical care and lack of life-saving vaccines lead to an estimated 800,000 diarrheal deaths in children under five and millions more hospitalizations every year. While many pathogens can cause diarrhea, rotavirus is the leading cause of severe and fatal diarrhea in infants and young children. Virtually every child in the world would have been infected with the rotavirus (RV) by the age of three. Globally, rotavirus gastroenteritis kills 527,000

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(475,000-580,000) children under five and is responsible for millions of hospitalizations and clinic visits each year (Figure I). Ninety-five percent of rotavirus deaths occur in developing countries in Africa and Asia[2].

In the management of diarrhea, basic interventions include; encouraging infant breastfeeding, improving access to clean drinking water, zinc supplementation and oral rehydration solutions (ORS). However, the rotavirus is so contagious and resilient that these simple measures, so effective in curbing other diarrheal diseases, do not effectively eliminate it[3].

Rotavirus Vaccines:

Children infected with the rotavirus develop strong immunity against a repeat severe rotavirus infection. Vaccination induces a primary infection without causing illness and is thus the optimal strategy to decrease the burden associated with severe and fatal rotavirus gastroenteritis (RVGE). The rotavirus vaccine mimics the protective first infection without causing illness thus inducing strong and broad heterotypicimmunity, after repeated doses, against future severe rotavirus infections.

Two orally administered RV vaccines are available today. Both have been extensively studied in trials in Africa, Asia, Europe, Latin America and the United States.
First introduced in the US in July 2006, it reduced hospitalizations for severe rotavirus by a significant 58-86% over three years[4].Two years after the introduction of the vaccine in Queensland, Australia in July 2007, there was an 89-94% reduction in rotavirus-related hospitalizations in children under five years of age[5]. Nicaragua was the first developing country to introduce the vaccine. The rotavirus vaccine was 60% effective in preventing severe RVGE[6].
In June 2009, the Strategic Advisory Group of Experts (SAGE), supported by the evidence from these and other pivotal studies, recommended the global inclusion of RV vaccination into all national programs for all infants[7].

The special supplement, "Rotavirus Vaccines for Children in Developing Countries," to the journal Vaccine in April 2012, reaffirmed that RV vaccines are proven to be effective, safe, cost-effective and are life saving. Although the RV vaccine was relatively less efficacious in clinical trials in developing countries compared to US or Europe, the much higher burden of severe RVGE in developing countries would confer a much higher public health benefit with the inclusion of the vaccine[8].

In Africa and Asia, where 95 percent of deaths due to rotavirus occur, more than 2.4 million child deaths can be prevented by 2030 by increasing access to lifesaving rotavirus vaccines. Universal use of RV vaccines can avert 6 million clinical and hospital visits, thereby saving

US$68 million annually in treatment costs[8].

Islamic Jurisprudence:

In the hierarchy of the goals of Islamic Jurisprudence (Maqasid al-Shariah); the preservation of life comes only second after the preservation of the Deen (religion). Life is a gift from Allah (SWT) and its protection and continuation is of utmost importance and urgency.

The sanctity of human life is emphasized in the Quran "…and if anyone saved a life, it would be as if he saved the life of all mankind"[9].

The Prophet (may peace be upon Him) related, "We are a people who do not eat until we are hungry. And if we eat, we do not eat to our fill." This narration, among others, is the backdrop to a powerful medical maxim "Prevention is better than cure".

This medical aphorism is further reinforced by the jurisprudence principle; "sadd-ul-dhara'i" – closing the doors to destruction or blocking the means of corruption.

These back to basics rulings alone are sufficient justification for the permissibility of immunizations to save the lives of innocent children, notwithstanding the issues related to the *"halalness"* of the vaccines. The question of *"halalness"* (permissibility) was raised because of the inclusion of the porcine enzyme trypsin in the manufacturing process of the two available RV vaccines namely *Rotateq (MSD)* and *Rotarix (GSK)*.This has triggered some concern in the Muslim medical fraternity, the Fatwa Councils and by extension the lay public.

The 81st Conference of the Fatwa Committee National Council of Islamic Religious Affairs, Malaysia was held on March 31, 2006 and discussed the ruling of using a rotavirus vaccine that utilized porcine sources in its production process[10]. The Committee decided that the usage of the rotavirus vaccine is not permitted based on the following three reasons:

1. There is no urgent need at the moment
2. There are alternative substances or medicines besides using pig sources in the production of the said vaccines
3. There is no concrete proof that people in the country are in dire need of such vaccine.

Trypsin is an enzyme that cleaves protein into smaller fractions. In the manufacture of the RV vaccine, trace amounts of trypsin is used to activate the virus and later to separate the virus from the cultured cells. Trypsin of porcine origin was preferred primarily based on a safety reason, being free of Transmissible Spongiform Encephalopathies. Through various steps of micro-filtration, the trypsin was completely removed from the end-product.

This however is not a new issue because it has been previously addressed by Muslim physicians, scientists, public health experts who are at the cutting edge of vaccinology and child survival strategies as well as jurists (*fuqaha*) in relation to the use of the oral poliovirus vaccine (OPV).

The Oral Poliovirus Vaccine (OPV) which has led to the virtual global eradication of polio, utilizes a similar technology in its manufacturing process. It utilizes small, virtually negligible amounts of trypsin derived from porcine origin, to disconnect the contiguous cells in the tissue culture. At that time there was a significant fatwa from the European Council of Fatwa and Research (ECFR) which in 2003 opined that "Out of piety, some brother Muslims in various parts of the world, particularly in East Asia, have issued a fatwa that it is not permissible to administer this vaccine (OPV) to children, due to the fact that porcine trypsin is used in preparing it [11].

The Council argued as follows:
a) What God forbids is the partaking of pork, and trypsin has nothing to do with pork
b) Even if we admit that trypsin is forbidden, the amount used in preparing the vaccine is negligible, if one applies the rule that "when the amount of water exceed 2 *qillas* (343 litres)", impurities no longer affect it"
c) Supposing that trypsin is unclean, it is thoroughly filtered, that it leaves no traces whatsoever in the final vaccine
d) In case the three arguments forwarded are still insufficient, the *haram* (forbidden) is made permissible in cases of necessity.

In their concluding remarks they emphasized, "The Council urges Muslim leaders and officials at Islamic Centers not to be too strict in such matters that are open to considered opinion and that bring considerable benefits to Muslim children, as long as these matters involve no conflict with any definite text."

Such is the latitude of rationale and magnanimity of our scholars (*fuqaha*) in addressing the bigger picture of child survival strategies and the advocacy of life saving vaccines.

Global Advocacy for Polio Eradication:

WHO Regional Office for the Eastern Mediterranean (EMRO) recently hosted a high-level consultation of Islamic scholars, from 6-7 March 2013, in the WHO Regional Office in Cairo[12]. The Federation of Islamic Medical Associations (FIMA) was one of the participants.

In its global efforts to eradicate polio, the consultation noted with much concern that this paralyzing and fatal disease remains endemic in three Muslim countries, namely Nigeria, Pakistan and Afghanistan. Up until 1 May 2013, there were 16, 6 and 2

cases of polio in the three countries respectively. There were no other reported cases elsewhere in the world[13].

The consultation unanimously reaffirmed that the polio vaccine is safe and does not contain any *haram* substance and emphasized the urgent need to rectify mis-conceptions about the polio vaccine and the global polio eradication program.

With the universal use of OPV this killer and paralyzing disease has been reduced by more than 99% to only 24 cases in 2013. The Federation of Islamic Medical Associations (FIMA) recently issued the Cairo Declaration for Polio Eradication on 28 February 2013 [14]. FIMA was also a signatory of the Scientific Declaration on Polio Eradication launched on 11 April 2013, joining hundreds of scientists and technical experts from 80 countries [15].

Since the manufacturing process of the two oral vaccines (OPV and RV) are similar, involving the use of minute amounts of trypsin which is later removed by ultra-filtration, the pivotal judicial edict of the permissibility of OPV can be similarly applied to the RV vaccine.

Towards Universal Mass Vaccination with Rotavirus Vaccines:

RVGE continues to scourge our youngest and most vulnerable, killing more than 1,200 children under five each day. The human tragedy is that RVGE is a vaccine preventable disease and many of these deaths can be averted by universal mass vaccination with the RV vaccine.RV vaccination offers the best protection against severe rotavirus diarrhea, and have been shown to save lives in countries which have incorporated RV vaccines in their National Immunization Program (NIP).

About 50 countries in the world have introduced RV vaccination in their national and/or regional immunization program (Figure III). Muslim countries which have included RV vaccination in their NIP include Morocco, Iraq, Bahrain, Qatar, Yemen, Saudi Arabia and Sudan. Muslim Pakistan and Nigeria are 2 of 5 countries which together contribue up to half of the global RV diarrheal deathsin 2008[16]. Through funding from the *GAVI Alliance,* formerly the "Global Alliance for Vaccines and Immunization" Pakistan has recently introduced the RV vaccine as part of their NIP.

Rotavirus Gastroenteritis and Vaccination in Malaysia:

The RV vaccine has been in use in Malaysia since 2006. Since it is not part of the Malaysian National Immunization Program (NIP),it is mainly utilized in the private health

sector. The uptake of the RV vaccine is still very low. Less than 20% of the birth cohort in the private medical facilities are immunized against RV.

A study of under-5 mortality in Malaysia in 2006 showed that there were 1,699 deaths [17]. Deaths due to diarrhea was the number 3 cause of deaths, contributing 83 deaths (4.9%), after congenital anomalies (25.1%) and pneumonia deaths (9.2%). This is unacceptably high for a country moving towards a developed nation status. Many of the developed nations in Europe, US, Canada and Australia have included the RV vaccine in their NIP

Discharge records from government hospitals showed that the cumulative risk of RV related disease by 5 years of age was 1 in 61 for hospitalizations and 1 in 37 for out-patient clinic visits[18]. The out of pocket cost associated with RVGE admission was estimated at USD 226 (106-799) which was 26% of the studied household income. The mean parental day work loss associated with RVGE admission was 4.8 days[19].All of these data suggest that the burden of RV disease is considerable and would be a substantial drain on the nation's health expenditure.

At present there are no other medicines or substances which can act as an alternative to the present two oral RV vaccines. These have been studied in virtually all regions of the world and proved to be effective, safe, cost-effective and are life saving.

It behooves Muslim healthcare providers as well as religious leaders to propagate this information especially its similarity with the polio vaccination program and work to increase the utilization of the RV vaccine generally and specifically its inclusion in the NIP of Malaysia.

Conclusions:

Rotavirus is the leading cause of severe childhood diarrhea and fatalities from gastroenteritis. Ninety five percent of these deaths occur in developing countries in Africa and Asia. Integrated with a package of interventions that includes ORS, zinc, breastfeeding, nutrition, good sanitation and hygiene, rotavirus vaccination offers the best hope for preventing severe diarrheal disease, and could save nearly 2.4 million lives by 2030.

However, the use of minute amounts of porcine trypsin in the manufacturing process of both RV vaccines has raised concerns amongst some in the Muslim community about the permissibility of the vaccine.

Lessons can be learnt from a precedent, an earlier fatwa issued on the use of OPV which is similarly manufactured using trace amounts of porcine trypsin. The European Council of Fatwa and Research (ECFR) chaired by Dr Yusuf al-Qaradawi and consisting of numerous renowned scholars in the Muslim

world, when allowing the use of OPV added that "the hesitation of some parents to have their children immunized with this vaccine (OPV) poses a risk to Muslim children alone. At the same time, it gives an unfavorable image which portrays

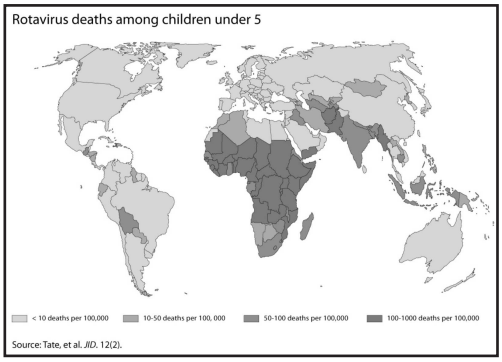

Figure I: Rotavirus death among children under 5 years

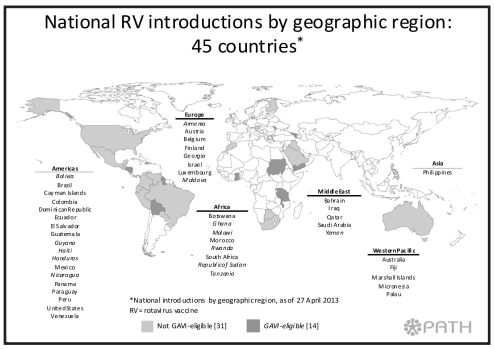

Figure III: National RV introductions by geographic region: 45 countries

Muslims as hindering a process that aims to eradicate, with God's permission, the existence of this disease on earth once and for all. After all, this eradication cannot be complete while there is even one child on earth carrying the virus."

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POLIOMYELITIS: THE END GAME

Musa Bin Mohd Nordin*

Introduction:

Polio is the common and abbreviated name of poliomyelitis derived from the Greek polios, "gray," and muelos, "marrow," meaning inflammation of the gray matter of the spinal cord.
The earliest cases of polio predates recorded history. An Egyptian stone carving, between 1580-1350 B.C. depicts a young man with a deformity of his limb which might have been caused by polio [1].

There were numerous outbreaks in the 18th century and the English physician Michael Underwood first clinically described polio as "debility of the lower extremities." The German physician, Jacob Heine's 78 page monograph in 1840 described the clinical features of the disease and suggested an underlying pathology in the spinal cord.

The first major polio epidemic in the United States occurred in 1894 and reported 132 cases. Various causes were suggested including "overheating, chilling, trauma, fatigue, and such illnesses as typhoid fever, whooping cough, and pneumonia" [2]. Two Austrian physicians, Karl Landsteiner and E. Popper first identified the polio virus in 1908 and polio became a notifiable disease entity.

Jonas Salk first developed the inactivated polio vaccine (IPV) and Albert Sabin the oral polio vaccine (OPV) between 1954-57. In 1952 and 1953 there were 58,000 and 35,000 polio cases respectively in the United States. After the introduction of the IPV in 1956, the rate dropped to about 5,600 cases in 1957 [3].

The World Health Organization (WHO) included the Sabin OPV under the auspices of the Expanded Program of Immunization (EPI) due to its lower cost and long-term efficacy. By the early 1970s most of the world was using Sabin's oral vaccine. There was an estimated 350,000 cases of polio in 1988. In same year, the World Health Assembly resolved that polio would be eradicated by the year 2000 [4]. WHO's Plan of Action for Polio Eradication anticipated that 2000 would witness the last case of polio caused by wild poliovirus and that global eradication would be certified in 2005. This has been a moving target, since various issues including wars, natural disasters, and poverty in

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many of the developing countries in Asia and Africa have prevented this polio-free world objective from being completely achieved. The Global Polio Eradication Initiative (GPEI), a partnership spearheaded by national governments, WHO, UNICEF (United Nations Children Fund), the US Center for Disease Control (CDC), Rotary International has since adopted a new strategy, the " Eradication and End game Strategic Plan", which has set to rech and sustain polio eradication by 2018[5].

The Polio Virus:

Polio is a highly infectious disease caused by a RNA enterovirus. The three serotypes, 1, 2 and 3 have minimal heterotypic immunity between them. They are rapidly inactivated by heat, formaldehyde, chlorine and ultra-violet light[6].

The portal of entry is oral. The virus replicates in the pharynx, gastro-intestinal tract and lymphatics. Hematologic spread to the lymhpatics and central nervous system facilitates its spread along the nerve fibres with selective destruction of the motor neurones.

Ninety to ninety five percent of poliovirus infections are subclinical. A febrile episode or an upper respiratory tract infection occurs in 4-8% of the infections and1-2% result in a non-paralytic poliomyelitis. Paralytic poliomyelitis is seen in only 0.1-1% of cases of poliovirus infections. One third of these recover completely whilst the other two thirds have varying degrees of motor weakness. The mortality rate is between 4-6%.

The Polio Vaccines:

The Salk trivalent IPV was first discovered in 1955. The Sabin trivalent OPV became first available in 1963. The IPV was responsible for the initial decline in the incidence of polio in USA. It has since been replaced by the enhanced potency eIPV in 1987[7].

The OPV is a live attenuated oral vaccine and has been responsible for the global decline in polio. It is associated with beneficial contact spread. However, it causes the rare vaccine associated paralytic poliomyelitis (VAPP) and in developed countries has been replaced by eIPV.

The Global Epidemiology of Polio:

Against an estimated global burden of 350,000 cases in more than 125 endemic countries, the World Health Assembly launched the Global Polio Eradication Initiative (GPEI) in 1988. Within 15 years, polio had been eliminated from all but 6 countries and fewer than 1,000 children had been paralysed by polio in 2003.

Today more than ever, the goal of a polio-free world is a tangible reality.

In 1994, the WHO Region of the Americas was certified polio-free, followed by the WHO Western Pacific Region in 2000 and the WHO European Region in June 2002. Of the three serotypes of wild poliovirus, type 2 transmission has been successfully stopped since 1999.

As of 8 May 2013, there were 26 cases of wild poliovirus compared to 53 this time last year. There were only 3 remaining polio endemic countries; Nigeria, Pakistan and Afghanistan reporting 18, 6 and 2 cases respectively. No cases of polio were reported from non-endemic countries while there were only 3 cases reported from Chad this time in 2012 (total 223 reported cases) [8].

The Global Polio Eradication Initiative Strategic Plans:

The GPEI employed the following key strategies to achieve its polio-free world objectives:

1.Maintain a high routine infant immunization coverage.

2.Mass immunizations campaign through National Immunization Days.

3.Localised mopping up campaigns.

4.Ensure high quality Acute Flaccid Paralysis (AFP) surveillance.

After the eradication of wild poliovirus, the continued use of OPV would compromise the goal of a polio-free world. The use of OPV if continued will result in a predictable burden of polio disease due to VAPP and will result in a predictable rate of polio outbreaks due to circulating vaccine-derived polio viruses (cVDPVs)[9].

cVDPVs are vaccine strains that have mutated and recovered the wild-type poliovirus capacity to cause paralytic disease and outbreaks through person-person transmission. Between 2000 and 2011, there were 20 cVDPV outbreaks resulting in 580 polio cases [10].

If the worldwide utilization patterns of OPV continued after confirmation of the eradication of wild-type poliovirus (WPV), it is expected that there would be 250 to 500 cases of VAPP per year and up to one polio outbreak due to a cVDPV per year [11].

Acknowledging the inherent risks of continued OPV use to the goal of a polio-free world, the GPEI Strategic Plan 2004-2008 included among others the coordinated cessation of OPV use or a phased replacement of OPV with IPV.

Polio Endemic Countries and the Religious Dimension:

India was once considered as the most difficult challenge to the GPEI strategic plans towards a polio-free world. India has interrupted the transmission of WPV for the past two years and was removed from the list of polio endemic countries in February 2012. India's achievements

reinforces the fact that polio can be eliminated even in the most challenging of circumstances.

Since 2003, Nigeria has served as the major reservoir for WPV1 and WPV3 circulation in West Africa and Central Africa. Over the past few years, WPV of Nigerian origin has been imported into 26 countries in Africa, the Middle East, and Asia, and has led to re-established transmission (>12 months) in Chad and Sudan.

A complex interaction of multiple factors contributed to the vaccine boycott in Nigeria [12]. Among others, this included rumours and misinformation regarding OPV which was being spread and preached in the name of Islam. The OPV was alleged to contain substances which were not safe and which can lead to infertility. It was also alleged that the OPV was made with "haram" constituents (not permissible by Islamic Law).

Similar loss of public confidence in OPV was observed in the two other endemic countries, namely Pakistan and Afghanistan with consequent low OPV uptake and Supplementary Immunisation Activities (SIAs) that failed to reach >80% of children in high-risk states.

The East Mediterranean Regional Office of the WHO (EMRO) submitted the issue of the permissibility of the OPV to the European Council of Fatwa and Research (ECFR) in 2003. The ECFR in its 11th regular session from 1-7 July 2003, at Stockholm, Sweden addressed it as follows; "Out of piety, some Muslim brothers in various parts of the world, particularly in East Asia, have made the fatwa that it is not permissible to administer this vaccine to children, due to the fact that porcine trypsin is used in preparing it."

The ECFR issued the following fatwa / opinion "First, it has been medically established that the administration of this medicine is useful, that, with God's permission it immunizes children against polio; and that so far there is no alternative vaccine. Consequently, it is permissible to use it for purposes of treatment and prevention, especially since forbidding its administration results in great harm. Even if it is admitted that this liquid vaccine is impure, there are ample cases in Islamic jurisdiction where the prohibition of impurities is waived. In this case, the impurity is exhausted through lavation and multiplication. Moreover, this is a case which involves a necessity or a need that amounts to a necessity. It is well known that one of the principal purposes of Islamic Law is to achieve

benefits and ward off harm and corruption. Second, the Council urges Muslim leaders and officials at Islamic Centres not to be too strict in such matters that are open to considered opinion and that bring considerable benefits to Muslim children, as long as these matters involve no conflict with any definite text" [13].

Scientific Declaration for Polio Eradication and Endgame Strategic Plan:

At FIMA's biannual executive committee meeting in Cairo, Egypt on 28 February 2013, one of the agenda items was a meeting with the Director General of EMRO to discuss current issues related to the polio eradication program and the pivotal role of FIMA and its affiliates, notably in Afghanistan, Pakistan and Nigeria.

FIMA viewed the GPEI 2013-2018 strategic plan seriously and favourably, and issued its Cairo Declaration for Polio Eradication on 28 February 2013 following their executive deliberations (Appendix I).

This FIMA executive committee meeting was also the precursor to the EMRO organised high level consultation of Islamic scholars and organizations from 6 to 7 March 2013, in the WHO Regional Office in Cairo, to identify the best strategies to enhance solidarity among Islamic scholars and leadership to counter false propaganda about the polio vaccine, promote its use to protect children of the Muslim Ummah against polio and call for urgent action to eradicate this paralysing disease in Muslim communities[14].

To reaffirm its commitments to the global polio eradication campaign, FIMA joined the fraternity of scientists and technical experts from 80 different countries to launch the Scientific Declaration on Polio Eradication on 11 April 2013. The world's scientists coalesced to endorse the Eradication and Endgame Strategic Plan, a new strategy by the GPEI to reach and sustain eradication (Appendix II).

The declaration highlights 5 major issues:

a. Polio eradication is doable considering the major progress that has been achieved thus far,
b. The Eradication and Endgame Strategic Plan plots very clearly the roadmap to a polio-free world,
c. GPEI (2013-2018) emphasizes apart from polio vaccinations, the importance of universal mass vaccinations against most other disease entities,

d. Warned that any scaling back of vaccination programs and its funding would have disastrous consequences and

e. Emphasized the importance of close collaboration and partnerships to achieve the historical milestone of polio eradication.

Conclusions:

FIMA hereby calls on all Islamic religious and community leaders to provide a strong message of support for polio eradication activities and the need to ensure all children are fully immunized against polio and all other vaccine-preventable diseases.

We urge all levels of political, religious and civil society in Muslim countries to overcome any remaining cultural, religious, political and security obstacles currently preventing all children from being reached and immunized against polio and all other vaccine-preventable diseases.

We earnestly call on all political, religious and civil society leaders to ensure the safety and security of frontline health workers, to enable them to perform their heroic tasks.

We plead to all governments in Muslim countries to prioritize and mobilize the necessary financial resources to enable the full implementation of all polio eradication strategies.

We call upon all our FIMA affiliates in their respective countries to be active partners of the Global Polio Eradication Initiative, providing leadership towards the creation of a world free from polio for all our children. Our collective efforts towards the creation of a polio-free world will undoubtedly be our legacy to future generations of children.

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Appendix I:

CAIRO DECLARATION FOR POLIO ERADICATION BY THE FEDERATION OF ISLAMIC MEDICAL ASSOCIATION

February 28, 2013, Cairo, Egypt

We, the Federation of Islamic Medication Association;

Recalling the Resolution of the Organization of the Islamic Conference at the Third Islamic Conference of Health Ministers in October 2011 calling for high-level support for polio eradication; and, the Resolution adopted by the World Health Assembly in May 2012, declaring the completion of polio eradication a programmatic emergency for global public health;

Noting that only three Member States of the Organization of the Islamic Conference remain endemic to the disease and that polio is now at the lowest levels ever since records began; and, recognizing the historic opportunity to eradicate polio within the next 12-24 months that will ensure that no child will ever again suffer from lifelong polio paralysis;

Recognizing that in all three countries, national polio emergency action plans have been launched under the auspices of the offices of the heads of state, to rapidly interrupt the remaining chains of wild poliovirus transmission;

Noting with grave concern the ongoing transmission of wild poliovirus in parts of Afghanistan, Nigeria and Pakistan, and remaining political, cultural, security and societal obstacles preventing all children in these areas to be vaccinated against polio; and in particular, the tragic and deadly attacks against frontline health workers in parts of Pakistan in December 2012;

Noting that in a country, polio eradication efforts require the full engagement of political and religious leaders, civil society organizations, medical fraternity, all sectors of society, and the support of all Ministries to gain access to and vaccinate every last child;

Recognizing the potentially devastating and deadly consequences of not eradicating polio, that may result in large polio outbreaks in polio-free countries of the region, and as many as 200,000 new polio cases annually within the next ten years worldwide; and, the new emergence of a circulating vaccine-derived

poliovirus outbreak in Somalia in 2011 and 2012, which has spread internationally to Kenya;

Noting the strong global commitment to eradicate polio and the extraordinary investments made by national governments, international development agencies, multi-lateral organizations, non-governmental organizations and the private sector, in particular the generous financial commitments by the Islamic Development Bank, the Saudi Fund for Development, the Crown Prince of Abu Dhabi, the governments of the Republic of Turkey and Brunei-Darussalam; but acknowledging that the realization of a polio-free world is currently jeopardized by an ongoing global funding gap;

Hereby call on:

1.All Islamic religious and community leaders to provide a strong message of support for polio eradication activities and the need to ensure all children are fully immunized against polio and all other vaccine-preventable diseases;

2. The mobilization of all levels of civil society to overcome any

remaining cultural, societal, political
or security obstacle currently preventing all children from being reached and immunized against polio, especially in areas of insecurity;

3. All public and civil society leaders to assure the safety and sanctity of frontline health workers, to enable frontline health workers to perform their heroic tasks in complete safety and security; and,

4. All Member States to help mobiize the necessary financial resources from governments, civil society, foundations, the private sector and multi-lateral institutions, to enable the full implementation of all polio eradication strategies.

We acknowledge and appreciate the tireless efforts of the millions of health workers, staff of the Ministries of Health, and partners of the Global Polio Eradication Initiative and pledge to deliver a world free from polio for all our children.

Appendix II:

SCIENTIFIC DECLARATION ON POLIO ERADICATION

Polio is a highly infectious disease that can cause irreversible paralysis and death. Today, the disease mostly affects children living in some of the world's poorest and most marginalized communities. Yet we are closer than ever to a world where no child will ever again be crippled or die from this disease. At this unique moment, an international group of scientists has come together to stress the achievability of polio eradication and endorse the Eradication and Endgame Strategic Plan, a new strategy by the Global Polio Eradication Initiative (GPEI) to reach and sustain eradication by 2018. The plan was developed in consultation with a range of technical experts, governments, funding partners and stakeholders and received unanimous support from the WHO Executive Board in January 2013.

Whereas,

Unprecedented progress, scientific advances and new tools give us confidence that eradication is achievable

1. New cases of wild poliovirus have dropped from an estimated 350,000 cases in more than 125 countries in 1988 to fewer than 250 cases in just five countries in 2012.

2. 2012 was a turning point for the remaining endemic countries. Nigeria, Afghanistan and Pakistan launched national emergency action plans that resulted in significant improvements in immunization campaign quality and the fewest new cases on record.

3. India stopped wild poliovirus transmission in 2011, proving that polio can be eliminated in the most challenging circumstances.

4. Two effective vaccines have protected hundreds of millions of children against the disease: oral polio vaccine (OPV) and inactivated polio vaccine (IPV).

The worldwide elimination of one of the three types of wild poliovirus (type 2)

more than a decade ago proves that eradication through the polio eradication strategy is feasible.

5. We have successful strategies to deliver vaccines and monitor coverage, strong surveillance to quickly detect and contain the virus, and innovative technologies and approaches such as geographic information system (GIS) mapping and new vaccine formulations to ensure that children are reached and protected.

2. The new Strategic Plan provides a clear path forward that capitalizes on this historic opportunity to end polio.

The plan is the first long-term, comprehensive strategy to complete and sustain eradication.

The plan's strategies are sound and, when implemented, will interrupt transmission, sustain eradication and maximize post-eradication benefits.

The plan presents a significant step forward over previous eradication strategies and offers strong solutions to challenges by including:

1) Data-driven strategies to overcome operational challenges—including missed children, vaccine refusal and insecurity—to ensure high quality immunization campaigns that can interrupt transmission globally; and

2) Plans to eliminate both wild poliovirus and vaccine-derived poliovirus, starting with the withdrawal of type 2 from OPV and introduction of IPV in all countries to boost immunity to remaining strains.

3. The new plan emphasizes the urgency of improving routine immunization systems and lays a foundation to protect children against other diseases

The plan recognizes that eradication efforts are interdependent with strengthened routine immunization. High levels of routine immunization are needed to achieve and sustain polio eradication. At the same time, eradication efforts demonstrate that it is possible to reach nearly every child, even in the most underserved and remote areas, with vaccines and other lifesaving interventions.

■ The Strategic Plan calls for GPEI to use its robust infrastructure to benefit routine immunization and other health programs. It includes strategies for polio eradication staff and processes to help strengthen routine immunization, in partnership with national immunization programs and the GAVI Alliance and in alignment with the Global Vaccine Action Plan.

■ Eradication would demonstrate that worldwide collaborations can successfully combat complex health threats, including in remote communities too often left behind.

4. Scaling back efforts would have devastating consequences

■ For polioviruses to survive, they must be transmitted from infected persons to susceptible persons in a continuous chain of human-to-human transmission. When immunity levels are high, the chains are broken. Today, there are fewer chains than ever before, creating an unprecedented opportunity to stop transmission.

■ Weakening our efforts would lower immunity levels, setting the stage for a resurgence of outbreaks. Polio is highly infectious and spreads quickly. If we aim for control rather than eradication—relying only on routine immunization to vaccinate against polio and eliminating mass vaccination and other eradication strategies—we can expect up to 200,000 cases annually.

We, members of the scientific community, declare our conviction that the eradication of polio is an urgent and entirely achievable global health priority. We endorse the Eradication and Endgame Strategic Plan and call on actors in the global community to do their part to ensure the full implementation of the plan. We urge:

■ Scientists to develop new and better tools to accelerate and sustain eradication, including low-cost IPV options, and to continue providing technical support to endemic countries.

■ Partners, including GPEI and vaccine manufacturers, to ensure sufficient supply of and access to different types of vaccines required for eradication, including IPV use in resource-poor countries.

■ Endemic country leaders and international program officials to stay fully committed and accountable to stop transmission. They can build on emergency plans to increase accountability and strengthen campaign quality. They can continue to develop regional- and community-specific solutions to bottlenecks such as vaccine refusals.

■ Endemic country governments and partners to strengthen security measures and deepen engagement with community and religious leaders to promote demand and protect vaccination teams and volunteers, in light of recent attacks on health workers across Pakistan and Nigeria.

■ International partners and national programs to strengthen linkages across polio vaccination efforts, routine immunization and other initiatives, including measles

prevention, maternal and child health and nutrition, to address the broad health needs of communities.

■ Partners, and national and global programs, to commit to strengthen routine immunization with the same urgency, robust technical and financial support and clear measurement indicators.

■ Partners to fully fund the Strategic Plan. Funding gaps in 2012 led to cancelled and scaledback vaccination campaigns in 24 countries, leaving children in these areas more susceptible to polio.

■ Civil society to continue to support efforts to end polio forever.

Polio eradication can be our generation's legacy to all future generations. Only working together can we make history and end polio.

Appendix III:

CONCLUSIONS AND RECOMMENDATIONS ISLAMIC SCHOLARS CONSULTATION

March 6-7, 2013, Cairo, Egypt

Objective of the Consultation

For the Islamic religious and technical leaders from across the *Ummah* to:

- Brainstorm on the best strategies to demonstrate solidarity across the Islamic countries to ensure the protection of Muslim children against polio.

Key Conclusions

The scholars:

- Had a consensus that the Muslim *Ummah* faces a serious problem of persistent polio that threatens all Muslim children.
- Expressed concern about the prevalence of rumours and mis-information regarding polio in the name of Islam.
- Reached a common understanding about the reasons why poliovirus is still circulates in some Muslim communities .
- Expressed a strong commitment to achieve the objective of a polio-free Islamic world by end 2014.
- Agreed on the fact that protection of children against polio is a collective responsibility of the *Ummah*, especially by its religious and political leaders
- Agreed that vaccination of children to protect them from polio is a religious obligation of the Muslim parents .

The scholars:

- Agreed that Islamic religious leadership and institutions have a crucial responsibility to support eradication of polio .
- Had a consensus on the fact that the polio vaccine is safe and does not contain any haram substance.
- Agreed that polio vaccine does not contain any substance that can cause

infertility.

- Emphasized that there is an urgent need to rectify mis-conceptions around the polio eradication programme and polio vaccine.

The scholars:

- Appreciated the clarification of the fact that Shakeel Afridi never worked for WHO and UNICEF and WHO and UNICEF had no involvement or any knowledge of his activities in Abbottabad.
- Stated that the killing of health workers is completely against the teachings of Islam and is strongly condemned.
- Unanimously condemned the use of health workers in intelligence collection and requested WHO to emphasize that all countries of the World should not use health interventions for any other purpose.

Recommendations :

An Islamic advisory group (IAG) should be constituted to build ownership and solidarity for polio eradication across the Muslim *Ummah* under the leadership of Al Azhar and in collaboration with Islamic Fiqh Academy; technical and secretarial support will be provided by WHO and UNICEF.

- A task force should be formed with the representation of key stake holders to formulate the terms of reference and modus operandi for the proposed advisory group by 15 April 2013.

- Under the guidance of IAG, meetings of national and international scholars should be convened soon in the 3 polio endemic countries in consultation with the national governments.
- International and national religious institutions should actively participate in the implementation of the polio eradication campaigns in the three endemic countries; joint field missions to be organized in collaboration with key Islamic institutions and organizations.
- Recognizing the concern around the rampant mis-information in the name of Islam, the religious and technical leadership at all levels should monitor, assess and respond effectively to the rumors about polio vaccination in coordination with IAG.

- As part of the secretarial function of WHO and UNICEF to the IAG, the two agencies should organize relevant technical information with guidance from religious scholars that addresses concerns of communities and local religious community leaders.
- As part of the secretarial function of WHO and UNICEF to the IAG, the two agencies should organize relevant technical information with guidance from religious scholars that addresses concerns of the communities and local religious community leaders.
- Appropriate information on polio vaccination should be disseminated widely to all Imams and mosques using effective dissemination mechanisms involving religious institutions and relevant media.
- Polio-related information and fatwas should be disseminated to parents and communities in appropriate language that is simple and easy to understand.
- The religious leaders and institutions should closely collaborate with the polio eradication programme in planning effective and appropriate strategies to reach children in the 3 endemic countries.
- The IAG should aim to link with all Muslim humanitarian and professional organizations and bodies for active involvement in immunization.

Appendix IV:

ISLAMABAD DECLARATION

Reiterating the Determination of a Healthy Future for the Children of MuslimUmmah

05-06 June 2013 Islamabad, Pakistan

We, the participants of the meeting held in Islamabad with collaboration of International Islamic University, Islamabad and Al-Azhar University Egypt:

Considering; a) the Resolution of the Organization for Islamic Conference during the third meeting of Health Ministers held in October 2011, that called for enhanced top level cooperation for polio eradication; and b) the resolution passed by the World Health Assembly in May 2012 declaring complete eradication of polio a global public health emergency:

1. We express utmost concern over the persistence of poliovirus in some parts of Pakistan (reservoirs), sub-optimal quality of the polio campaigns in these areas and certain political, cultural, social and security related obstacles in this regard.

2. We strongly condemn the activity of Dr. Shakeel Afridi in Abbottabad that has caused doubts and suspicions among the public about the public health activities. We strongly recommend that public health activities must always be used for public health purposes only.

3. We strongly condemn the attacks on polio workers and their killings. These are acts of extreme brutality and cowardice. These attacks and killings are against the teachings of Islam and are not acceptable at any cost. We declare these attacks as inhuman and non-Islamic acts. We demand the Government to acknowledge the services of the martyrs and support the suffering families. We also condemn the martyrdom (killing) of innocent people and children during the drone attacks.

4. We believe that it is the basic responsibility of the Government to ensure peace on permanent basis in the bordering areas (KP/FATA) of Pakistan. This will smoothen the way for social welfare activities in

these areas. Moreover, this will also help conducting intensified polio drives and eradicate the disease from these areas.

5. We admire the fact that majority of the Muslim countries have eradicated polio using the same oral polio vaccine (that is being used in Pakistan). The efforts made by the Governments and public of these countries are commendable.

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We, the religious scholars, spiritual leaders, Muftis and intellectuals have examined the matter (polio eradication) from academic, jurisprudential (Islamic), medical and political perspectives and have thoroughly analyzed the doubts and suspicions that were raised. Trusting the information materials and explanations provided by the medical experts we have reached the conclusion that:

1. Polio vaccine being used in Pakistan is safe and effective.

2. Polio vaccine has no ingredients that cause infertility (or any harm to the reproductive system).

3. Polio vaccine does not contain any *"Haram (prohibited)"* or hazardous to health ingredients.

Necessary steps should be taken to disseminate, satisfying research based answers/facts regarding the above matters among the public.

***

We fully agree and support the commitment to polio eradication and reiterate our commitment that:

1. We will encourage and advise (using our influence) the general public to ensure polio vaccination of all the children, every time (during polio campaigns). Besides, we will also encourage them to complete the routine immunization for their children.

2. We will play our role effectively to overcome the existing social, cultural, political and security related barriers (in regards to polio eradication).

3. We ourselves and through the religious scholars at the district and union council levels, will ensure effective dissemination of messages to the public that safety and sanctity of the polio teams is our joint responsibility.

4. We will play our role effectively to mobilize the public/communities for polio eradication. Moreover, we will also ensure the engagement of the district and union council level religious leaders/figures in this regard.

5. We will make our best efforts to enhance awareness about polio eradication utilizing personal and institutional influence.

***

We consider that the consultation meeting in Islamabad has provided an opportunity for religious scholars, health specialists and doctors to jointly examine the situation of polio eradication (in the country), the hindrances and their solutions. This meeting has also been an opportunity for us to deliver our recommendations to the relevant authorities and agree on the right direction of our support and role.

We express utmost admiration for the zealous and untiring efforts for polio eradication, appreciate them and solemnly pledge to play an effective role to provide our children a "Polio Free Pakistan".

RELIGIOSITY (DIINI) FOR HIV PREVENTION: EXPERIENCE FROM UGANDAN MUSLIMS AND CHRISTIANS

Magid Kagimu*

Abstract:

HIV/AIDS is still an international dilemma with new infections continuing to occur. Biomedical interventions which have often received more emphasis and funding have not solved the problem of rising new infections in countries such as Uganda. Religiosity (Diini) has been an underutilized potential solution to the problem of HIV/AIDS, partly because of insufficient supportive scientific data. New scientific data among Ugandan youth 15-24 years, showed that youth with higher levels of religiosity, had significantly lower HIV infection rates compared to those with lower levels of religiosity. This suggests that many youth manage to prevent HIV infections by using their high level of religiosity to avoid HIV-risk behaviors.

The religious leaders and educators should continue to encourage these youth and all individuals and families to increase the use of religiosity for HIV prevention. Religious leaders should be supported by healthcare workers and other stakeholders, in their work of reminding people to use religiosity for HIV prevention. If people living with HIV/AIDS use their religiosity to avoid spreading HIV infections and people who have not got HIV infections use their religiosity to avoid getting HIV infections, the move towards the global vision of zero new HIV infections is likely to be faster.

Key words: Religiosity, HIV prevention, Uganda, HIV risk behavior.

Introduction:

HIV/AIDS continues to be a troubling international dilemma. The Joint United Nations Program on HIV/AIDS (UNAIDS) estimated that in 2011 there were 34.2 million people globally living with HIV infection, 2.5 million people became newly infected with HIV and 1.7 million died of AIDS[1]. In Uganda, with an estimated 2012 population of 34 million of whom 85.2% are Christians and 12.1% are Muslims according to the 2002 census, new infections have continued to rise annually, from 84,000 in 1994 to

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130,000 in 2011[2]. According to 2005 estimates, HIV/AIDS was the leading cause of adult deaths in Uganda. The disease caused every third adult death and one fifth of all deaths. Everyday 370 individuals became HIV infected, 290 became ill enough to require antiretroviral therapy and 210 died of AIDS. In 2011 it was estimated that 353 new infections and 175 deaths occurred per day.

Reports from the Ugandan Ministry of Health indicate that HIV/AIDS is the commonest cause of death among young adults aged 20 – 45 years. The proportion of Ugandans in this age group with HIV infections rose from 6.4% in 2005 to 7.3% in 2011. If you visit medical wards in Ugandan hospitals including Mulago national referral hospital, you will find very many young people admitted and bed ridden struggling with HIV/AIDS. Some of these young people have been taking antiretroviral medicines which prolong life, but these medicines do not cure the disease, they have to be taken daily for life and they are sometimes toxic to the body which may result in worsening of the illness or death of the individual taking them. All this is not good news for all Ugandans in particular and the international community in general, especially when we all know that HIV/AIDS is a preventable disease. We are still far from UNAIDS global HIV/AIDS response strategy of three zeros namely; zero new HIV infections, zero HIV/AIDS related deaths, and zero discrimination against people living with HIV/AIDS. The big question therefore, is that if HIV/AIDS is preventable why is it not prevented?

Biomedical interventions are not enough in preventing new HIV infections:

Biomedical interventions have often received more emphasis and funding compared to behavioral interventions. The biomedical interventions include condom promotion and distribution, antiretroviral medicines for HIV prevention, HIV counseling and testing and safe male circumcision. For various reasons, implementing these interventions has not solved the problem of rising new HIV infections in Uganda. Many people including community leaders are asking what they have not done to stop the HIV epidemic.

Religiosity (Diini) for HIV prevention is an underutilized potential behavioral solution:

One intervention that has been underutilized and underfunded is religiosity. This is partly because there was insufficient scientific data on the relationship between religiosity and HIV infections. It is believed that a high degree of religiosity results in behaviors such as abstaining from sex before marriage and being faithful in marriage which results in reduced HIV infection rates. Religiosity is the degree of adherence to religious practices and getting associated spiritual experiences.

Religiosity has many dimensions and so it is called multidimensional. There is no one word for religion in African languages or in the Holy Bible. The borrowed Arabic language term is "Al Din" which means "way of life". This word is present in the Glorious Qur'an. In the local languages in Uganda, religion is translated as "Diini". Having "Diini" means having good behavior. Having no "Diini" means having bad behavior.

New scientific data supports using Religiosity (Diini) for HIV prevention:

Researchers from Makerere University School of Public Health, Department of Medicine, and Department of Sociology in partnership with the Islamic Medical Association of Uganda, have recently made a significant contribution towards understanding the potential role of religiosity (Diini) in HIV prevention[3-8]. They have studied one of the communities in Wakiso district and found new scientific data showing that indeed HIV infections are being prevented by many Ugandans most likely using their religiosity (Diini). They studied young people 15 – 24 years old in this community, assessed their level of religiosity (Diini) and tested them for HIV infections. They found that the youth who ever had sexual relations, who had multiple sexual partners, who ever had sexual relations during menstruation, who ever drank alcohol and who ever used narcotic drugs for recreation had higher rates of HIV infections when compared to those who did not have these factors. These factors were therefore recognized as some of the drivers of the HIV epidemic.They also found that overall the youth who had higher levels of religiosity (Diini) had lower HIV infection rates. The youth with higher levels of religiosity (Diini) were more likely to have good behaviors of abstaining from sex, being faithful in marriage and avoiding alcohol and narcotic drugs for recreation.

Among Christians, the youth who had higher levels of the following dimensions of religiosity had lower HIV infection rates:

1) Praying privately several times a day; the risk of having HIV infections among those who did not pray frequently was twice that of those who did pray frequently.
2) Feeling guided by God in daily activities.
3) Feeling thankful for God's blessings.
4) Trying hard to be patient in dealing with oneself and others.
5) Trying hard to love God with all one's heart, soul and mind and
6) Asking for God's help amidst daily activities.

Among Muslims, the youth with Sujda, the black mark on the forehead as a result of prostration during regular prayers, had lower HIV infection rates. Muslim youth who fasted the month of Ramadhan or more, also had lower HIV infection rates. The risk of having HIV infections among the Muslim youth

without Sujda was 3 times when compared to the youth with Sujda. Muslim youth with Sujda were more likely to abstain from sex, be faithful in marriage, avoid drinking alcohol and avoid using narcotic drugs for recreation.

The researchers concluded that higher levels of religiosity (Diini) were associated with good behaviors that are likely to reduce new HIV infections and in turn many youth with higher levels of Diini appeared to have managed to prevent HIV infections resulting in their lower HIV infection rates. This is excellent news for all our communities. It means our young people can prevent HIV infections by increasing their levels of religiosity (Diini). Many of them are already using this option and it is up to all of us, especially the religious leaders, to support these young people and encourage them to continue to use their Diini for HIV prevention. It is the responsibility of all of us, especially the religious leaders, to regularly remind ourselves, our families and our communities in general to use our religiosity (Diini) for HIV prevention. We would like as many people as possible to use their religiosity (Diini) for HIV prevention, so that we reduce new HIV infections and eventually the HIV prevalence rate.

All people have the will power given to them by God, within each one of them, which they can use to prevent new HIV infections. The people living with HIV/AIDS are the most important partners in ensuring new HIV infections do not occur. If they increase their religiosity (Diini) they are likely to adopt behaviors likely to reduce the spread of HIV infections in accordance with their religion. Researchers have also found that people living with HIV/AIDS, who have higher levels of religiosity, are more likely to adhere to taking their antiretroviral medicines regularly when compared to those with lower levels of religiosity[9].They are therefore, more likely to live longer and participate in providing counseling and guidance to their children, families, friends and communities on how to avoid new HIV infections. It is likely God would reward such people for their contribution to HIV prevention. The people without HIV infections need to increase their religiosity (Diini) so as to maintain behaviors likely to reduce new HIV infections and thereby maintain their HIV negative status.

Five pillars of using Religiosity (Diini) for HIV prevention:

Everyone should remember the five pillars of how to use religiosity (Diini) for HIV prevention which are supported by the new scientific information. These pillars are the things everyone should remember and do to prevent new HIV infections on a regular basis. They should be at the tips of the fingers of everyone.

Pillar 1: Believe in, trust and obey God, and His messengers:

This pillar is supported by the new scientific data, showing that people with higher levels of the following dimensions of religiosity related to God have lower HIV infection rates compared to those with lower levels of these dimensions:

1. Ask for God's help amidst daily activities
2. Feel guided by God amidst daily activities
3. Feel thankful for God's blessings
4. Try hard to love God with all one's heart, soul and mind.

Pillar 2: Learn and use scientific knowledge, information and wisdom about HIV/AIDS prevention in accordance with God's guidance:

This pillar is supported by scientific data showing that people with higher levels of religiosity have lower HIV infection rates when compared to those with lower levels of religiosity.

Pillar 3: Learn and use faith teachings and practices that support HIV prevention in accordance with God's guidance:

This pillar is supported by scientific data showing that people who pray several times daily have lower HIV infection rates compared to those who do not. For Muslims this pillar is supported by scientific data showing that people who pray several times daily, resulting in getting Sujda, have lower HIV infection rates compared to those who do not.

Pillar 4: Participate in partnerships for HIV prevention by listening to and using good advice from parents, religious leaders, health care workers and community leaders in accordance with God's guidance:

This pillar is supported by scientific data showing that people who listen to or watch religious programs on radio and TV usually given by religious leaders, are more likely to have good behaviors that are expected to reduce new HIV infections compared to those who do not. It is also supported by scientific data showing that youth who have both parents alive and presumably giving good advice to their children, have lower HIV infection rates when compared with the youth who have lost one or both parents.

Pillar 5: Use the concept of self-control for HIV prevention according to God's guidance and resist Satan that brings temptations by regularly asking and praying for God's help. For the Muslims, use the concept of self-control (Jihad Nafs) for HIV prevention according to Allah's guidance and resist Shaitan that brings temptations by regularly praying for Allah's help and seeking refuge in Allah:

This pillar is supported by the scientific data showing that people who frequently try hard to be patient

and exercise self-control in their dealing with themselves and others at home, work and during leisure in accordance with God's guidance, have lower HIV infection rates compared to those who have lower levels of this behavior. In addition, people who fast as a means of self-control in accordance with their faith teachings have lower HIV infection rates compared to those who do not. For the Muslims, people who fast the month of Ramadhan or more as one of the means of self-control, in accordance with their Islamic faith teachings, have lower HIV infection rates compared to those who do not. People who frequently pray also had lower HIV infection rates. For the Christians, these people are more likely to pray in accordance with the teaching of Jesus Christ and include asking for God's protection from Satan as follows:

"*Do not bring us to hard testing, but keep us safe from the Evil One"*[10]*:*

For the Muslims, these people are more likely to pray in accordance with the teachings in the Glorious Qur'an including asking for Allah's protection from "Shaitan" (Satan) whenever confronted with temptations reciting:

"If a suggestion from Shaitan assails your mind, seek refuge with Allah; for He hears and knows all things. Those who fear Allah, when a thought of evil from Shaitan assaults them, bring Allah to remembrance when lo! They see alright"[11]

Moving beyond ABC to ABCDE of HIV prevention:

In practice all people should remember that HIV prevention is not difficult. It is as simple as remembering ABCDE. These letters represent the five things that everyone should do. All people should have these things at the tips of their fingers. This is the new strategy to prevent new HIV infections. It has been said that if you do the same things the same way, do not expect to get different results. We have been using the ABC strategy for HIV prevention and we are seeing the HIV epidemic beginning to rise in some countries such as Uganda. It is time to move beyond the ABC to the new ABCDE strategy. These are the five things that everyone must do to prevent new HIV infections.

A – Abstain from sex before marriage and abstain from sex outside marriage in accordance with God's guidance.

B – Be mutually faithful in marriage which includes couple HIV counseling and testing in accordance with God's guidance.

C – Care for and protect the people you love to ensure they do not get new HIV infections, including yourself, your

spouse, your children, your family, your friends and your community members in accordance with God's guidance.

D – Diini (religiosity) – use your Diini at home, at work and during leisure to prevent new HIV infections in accordance with God's guidance and remember the five pillars of how to use Diini for HIV prevention as the backbone of the ABCDE strategy.

E – Educate yourself, your spouse, your family, your friends and your community by listening to and using good advice from community educators who include parents, religious leaders, health care workers and other community leaders and by regularly reminding yourselves and accepting to be reminded, about HIV prevention in accordance with God's guidance. This includes educating yourselves to be patient and to persevere in adherence to the ABCDE strategy in accordance with God's guidance.

Essential factors required to support Religiosity (Diini) as a "behavioral vaccine" for HIV prevention

For this new strategy of Religiosity (Diini) for HIV prevention, to work effectively, it requires at least 3 things:

1. Reminders to individuals and communities about the use of Diini for HIV prevention. Our usual reminders on these issues are the religious leaders. These must be supported in every possible way to strengthen their work of reminding our communities about this issue. All people should support these religious leaders by listening to their advice and accepting to be regularly reminded about the use of Diini for HIV prevention. Other reminders that must be used include electronic and print media including mobile telephones, as well as other innovative community reminders such as music and drama. The media are especially important in monitoring and reporting behaviors likely to increase new HIV infections in the community as well as those likely to reduce new HIV infections. The religious leaders should be able to use these stories to regularly remind their communities to use Diini for HIV prevention. Human, technical and financial resources must be mobilized by everyone to support our religious leaders to be able to do a better job of reminding us to use Diini for HIV prevention and control. When religious leaders are asked about what they need to do a better job they say they require the following six items:

2. Volunteer assistants to help them in

their work including lay men, women and youth.

2.Training and refresher training of the religious leaders and their assistants in HIV/AIDS service delivery including how to effectively use Diini for HIV prevention and control in their congregations.

3. Financial support for the religious leaders and their assistants to cater for transport, communication and incentive allowances as they do their work of community education and reminding people.

4. Support and technical assistance from health care workers in strengthening the work of religious leaders in health education of the communities, this is where the Federation of Islamic Medical Associations (FIMA) and similar organizations come in,

5. Support in developing, producing and disseminating appropriate information, education and communication materials that include the use of Diini in HIV prevention and control and also support for conducting print and electronic media activities.

6. Support in initiating and sustaining income generating activities to address poverty, ignorance and disease within their communities which predispose to HIV infections. The religious leaders say that these six items are intended to strengthen the spirit of voluntarism which they and their assistants invest in this work.

II. Interactive education sessions where spouses, parents, children, family members, friends and community members regularly have discussions on everyday lessons learnt in using Diini for HIV prevention in view of what goes on around them in the processes of socialization within their communities. All people should remember that most new HIV infections occur during the processes of our socialization. We should all endeavor to make our socialization processes free from acquiring and transmitting new HIV infections. Socialization at night is especially problematic for many in our communities because it is often at night that HIV risk behaviors predominate. This issue needs regular discussions in our communities to find ways of using Diini to ensure the night life of our communities is safe from HIV transmission and HIV acquisition.

III. Multifaceted interventions in promoting Diini for HIV prevention, including regular reminders, local consensus processes, marketing strategies, feedback and correction of misconceptions, and monitoring and evaluation of progress in the use of Diini for HIV prevention.

There must be more intensive activities, involvement, and commitment to using religiosity for HIV prevention by all people and their friends and partners. In this way religiosity (Diini) will become the "behavioral vaccine" for HIV

prevention as some people have called it. Diini will serve to strengthen people's resistance against behaviors likely to increase new infections. For this behavioral vaccine to be effective, it requires regular booster doses from religious leaders and other partners in the social environment of the individual.

Conclusions:

For both Muslims and Christians we should all be happy about the discovery that the more religious we are the more likely we shall be able to prevent new HIV infections. For Christians, this is in line with the teaching of Jesus Christ when he said in his sermon on the mount that:

"Happy are those whose greatest desire is to do what God requires: God will satisfy them fully"[12].

If Christians follow the teachings of Jesus Christ, God will satisfy them by reducing their new HIV infections and HIV prevalence rates.

The Muslim community, should also be happy about the discovery that the more religious they are the more likely they shall be able to prevent new HIV infections. This is in line with the teaching in the Glorious Qur'an as follows:

"You are the best of peoples evolved for mankind, enjoining what is right, forbidding what is wrong, and believing in Allah (GOD) . "[13]

If the Muslims follow the teachings in the Glorious Qur'an and Hadith (Prophet Muhammad (ﷺ) sayings). Allah will be pleased with them and make them the best of peoples in reducing their new HIV infections and which will result in reducing their HIV prevalence rates Inshallah.

In the 2011 Uganda national AIDS indicator survey by the Ministry of Health, the HIV prevalence rates by religion were as follows: Catholics 7.8%; Protestants 7.5%; Seventh-Day Adventists 7.5%; Pentecostals 6.9%; other Christians 6.4%; Muslims 5.7%; and other religion or no religion 9.5%. These rates are quite high for all religious denominations. All religious denominations in Uganda and elsewhere in the world, must start moving faster towards the global vision of zero new HIV infections as the finishing line, by using their Diini for HIV prevention.

We pray to Almighty God to assist us all in this race and help those who have not got HIV infections to use their Diini to avoid getting HIV infections. We pray to God to help those who are living with HIV/AIDS to use their Diini to avoid spreading it and to help them take their medicines regularly without complications so that they can live long healthy productive lives for the benefit of our communities. Ameen.

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11. Glorious Qur'an, Chapter 7, verses 200-201.

12. Holy Bible, Matthew, Chapter 5, verse 6.

13. Glorious *Qur'an, Chapter 3, verse 110.*

YOUTH PROTECTION FROM HIV/AIDS AND OTHER SEXUALLY TRANSMITTED DISEASES

Abdelhameed Qudah* and Aly Misha'l

Abstract:

Sexually transmitted diseases (STDs) in general and HIV/AIDs specifically are major global dilemmas. More than 50% of affected subjects are in the age group (15-25) years, with obvious major health, psychosocial and economic consequences, especially in developing countries.

Statistics in most Muslim countries reveal relatively lower prevalence of these diseases, as compared with other parts of the world. Some workers ascribe that to the influence of Islamic culture and values. This concept, although partially correct, has generated an attitude of false security that our societies are not susceptible to this pandemic. This line of thinking has led to complacency in adopting sound policies of public awareness and protection efforts. There is overwhelming evidence suggesting vulnerability of significant segments of our societies, especially the youth, who are engaged in lifestyles that may ultimately lead them to contract such infections. In fact, new global HIV reports reveal recent declines in new HIV infections in some parts of the world, but significant increases in some Muslim countries.

To fill this gap, FIMA experts in STDs have designed a viable and continuous protection program, under title (Youth Protection from HIV/AIDs and STDs) in Jan 2006.

So far, the program trained more than 10,000 male and female community leaders from more than 40 nationalities, both men and women Their educational backgrounds and qualifications included scientific, medical, ethical and religious parameters to enable them to play leading roles in their respective societies.

According to feedback information these leaders delivered more than 250,000 lectures, seminars and media presentations, to youth centers, mosques, schools, universities and other local community setups.

In this article, salient features, modalities and outcomes of this ongoing program will be outlined.

Keywords:
HIV/AIDS, Sexually transmitted diseases, HIV transmission, Sexual morality.

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Introduction:

It is estimated that approximately 34 million people, worldwide, were living with HIV at the end of 2011[1].

With recognized variations among countries and regions, it is estimated that globally 0.8% of adults aged (15-49) years are living with HIV[1].

Sub-Saharans Africa remains most severely affected, with nearly 1 in every 20 adults (4.9%). This represents 69% of all people living with HIV/AIDS (PLWA) worldwide[1].

The Caribbean, Eastern Europe and Central Asia are second to sub-Saharan Africa, with 1.0% of adults living with HIV in 2011[1].

Around 5 million people are living with HIV in South, South East and East Asia[1].

New infections with HIV in 2011 were approximately2.5 million, with regional variations.

Gender variation of HIV infection continued. Women and girls are more frequently affected across all regions, due to their lower socioeconomic, educational and political status.

In most Muslim countries and communities, available statistics point towards lower prevalence of HIV/AIDS and sexually transmitted diseases (STDs) in general, as compared with other world regions.

There is general thinking that Islamic culture and values play a major role in limiting HIV transmission. Table 1 compares HIV prevalence in Muslim-majority regions with that in sub-Saharan Africa and the World.

These statistics from UNAIDS 2012 Global Report reveal significant increases in new HIV infections in the Middle East and North Africa, 35% between 2001 and 2011[1]. This report also shows significant increases in Muslim countries like Bangladesh and Indonesia, compared to many parts of the world that witnessed reduction of new infections that took place with widespread antiretroviral drug use and other prophylactic efforts.

Notions from contemporary prevailing social change and lifestyles in Muslim countries, especially the youth, point to expectations of possible increased HIV transmission that may escalate unabated.

Many concerned workers caution from attitudes of false security in Muslim societies from susceptibility to HIV and STDs. This attitude may lead to complacency in adopting

	Adults and Children living with HIV	Newly infected with HIV
Middle East and North Africa	2011: 300,000 2001: 201,000	2011: 37,000 2001: 27,000
South and South East Asia	2011: 4.0 million 2001: 3.7 million	2011: 280,000 2001: 370,000
Sub-Saharan Africa	2011: 23.5 million 2001: 20.9 million	2011: 1.8 million 2001: 2.4 million
Global	2011: 34.0 million 2001" 29.0 million	2011: 2.5 million 2001: 3.2 million

Table1: Regional HIV/AIDS statistics: 2001=2011 (rounded number)

sound and sustainable policies and activities towards public awareness and prophylactic efforts.

Meeting the Millennium Development Goal #6:

In the 2011 United Nations Political Declaration on HIV/AIDS, countries pledged to intensify efforts to achieve ambitious goals towards elimination of the pandemic. Specific targets for 2015, as stated in UNAIDS Global report in 2011 could be summarized in the following 10 points[1]:

1. Reduce sexual transmission by 50%.
2. Reduce HIV transmission among people who inject drugs by 50%.
3. Eliminate new infections among children and substantially reduce the number of mothers dying from AIDS-related causes.
4. Provide antiretroviral therapy to 15 million people.
5. Reduce the number of people living with HIV who die from tuberculosis by 50%.
6. Close the global AIDS resource gap and increase the annual global investment from US $ 22 billion to US $ 24 billion in low-and middle-income countries.
7. Eliminate gender inequalities and gender-based abuse and violence and increase the capacity of women and girls to protect themselves from HIV.
8. Eliminate stigma and discrimination against people living with and affected by HIV by promoting laws and policies that ensure the full realization of all human rights and fundamental freedoms.
9. Eliminate restriction for people living with HIV on entry, stay and residence.
10. Eliminate parallel systems for HIV-related services to strengthen the integration of the AIDS response in global health and development efforts.

State of the HIV pandemic:

Worldwide, new infections with HIV in 2011 were approximately 2.5 million, with regional variations.

Although there was significant decline in rate of new infections in some parts of the world since 2001, the trends are worrisome in the Middle East and North Africa, with an increase of more than 35% (from around 27,000 to 37,000).

Epidemiological trends in at least nine countries, namely: Bangladesh, Georgia, Guinea-Bissau, Indonesia, Kazakhstan, Kyrgyzstan, Philippines, Maldives and Sri Lanka revealed the number of people newly infected with HIV in 2011 was at least 25% higher than in 2001.

Sexual transmission:

Sexual transmission accounts for the overwhelming majority of new HIV infections. The current pace of progress is insufficient to reach the global goal of halving sexual transmission by 2015. According to the UNAIDS global report, this target requires more effective combination of behavioral, biomedical and structural strategies[2,3].

People who inject drugs:

This category of individuals have 22 times the rate of HIV infection as the general population in 49 countries with available data[4,5]. Most low-and middle-income countries are vulnerable to increased risk of HIV exposure due to drug injection.
Some Muslim countries, including Indonesia and Malaysia have been reported among countries with marked increased prevalence.
Although HIV spending on people who inject drugs has markedly escalated, including provision of needles and syringes, the outcome has been disappointing[1].

Men who have sex with men:

The prevalence of HIV infection in this category of subjects has recorded significant increases in some regions of the world[6], with difficult obstacles in prevention efforts.

HIV infection in sex work:

Female sex workers are 13.5 times more likely to be living with HIV than other women[7]. In 2012 country reports, although there has been increased funding for HIV prevention programs for sex workers (total spending rose 3.7 fold during 2006-2011), the outcomes remain questionable.

Distributing and Promoting Condoms:

Despite the serious debate about the protective effects of condom ,still this practice is considered a critical element of current combination prevention strategies to reduce sexual HIV transmission.
Although condom use is reported to be increasing in several countries, recent surveys indicate decline in its use in many countries, especially in sub-Saharan Africa[8].

Voluntary male circumcision:

This practice was reported to reduce the likelihood that men will acquire HIV from infected female partners.
Since 2007, WHO and UNAIDS have recommended voluntary male circumcision in countries with high rates of HIV infection[9]. Countries like Ethiopia and Swaziland achieved more than 20% of their national target, and both have integrated male circumcision into infant programs.

Antiretroviral prevention therapy:

This topic has increased during the past 2-3 years, with significant reduction of HIV transmission, including reducing likelihood of uninfected persons to acquire HIV infection. Pre-exposure prophylaxis, if properly and widely used, could be effective in reducing HIV transmission. Major financial resources are needed to fund widespread application of ante-retroviral use. Therapy must continue for life. However, the gap between people who can access treatment and

people in need is still very large, nearly 40%, and the gap is set to grow further[10,11].

Mother-to child transmission:

In 2011, there was progress in limiting HIV infection from mother to child, but not in most countries. From 2009 to 2011, antiretroviral prophylaxis has been instrumental in prevention of HIV infection among children[12,13].
The progress has not been universally apparent in low-and middle-income countries, in view of deteriorating international funding which stagnated with the onset of the global economic downturn[1]. The Middle East and North Africa is a region that has yet to see such progress.

AIDS-related deaths:

In 2011 around 1.7 million died from AIDS-related condition worldwide[1]. This represented a significant decline in many parts of the world, especially those with marked prevalence of the disease. This progress took place mainly due to increase of antiretroviral therapy in low-and middle-income countries. Out of 14.8 million people eligible for HIV treatment in the world, only 8 million have been on HIV treatment by the end of 2011. Deaths, however, have recorded a significant increase in some Muslim countries, including the Middle East and North Africa, where there was 17% increase[1].

Funding:
Huge funding has been required to face HIV treatment and prophylaxes, and the expenditure is expected to escalate. Total global HIV investment in 2011 was USD 16.8 billion, which is expected to escalate to the global goal of USD 22-24 billion annually in 2015[1].
Donor contributions continue to play a critical role in funding the AIDS expenses, especially in low-and middle-income countries. Increasingly many middle-income countries have assumed greater roles in funding their own national programs. Many countries, however, still rely heavily on international assistance.
Efforts must be intensified to reach the 2015 target of mobilizing USD 22-24 billion annually.

FIMA Response to the HIV/AIDS Pandemic:

The Federation of Islamic Medical Associations (FIMA) and her Islamic Medical Associations (IMAs) affiliates in several parts of the world have been unduly concerned with the HIV/AIDS pandemic and the increasing trends of HIV transmission and disease in their Muslim communities.

In Africa, the Islamic Medical Association of Uganda, a FIMA member, has been playing pioneering roles since 1989[14,15]. Local and regional activities have been

implemented using novel Islamic approach. Three International Muslim Leaders Consultations on HIV/AIDS were organized where health professionals, religious and social leaders, women and youth activists, together with governmental and non-governmental organizations assembled to share experiences in understanding and implementation of the Islamic approach to the HIV/AIDS epidemic.

The following are the main features of the adopted Islamic approach to HIV/AIDS, which form the basis of leaders/workers training, as well as community and country proposed plans of action:

(1) Spiritual and belief system:

Islamic teachings and guidance to mankind that promote sound ethical behavior and lifestyle, which by themselves can lead to prevention of HIV/AIDS and other STI[s], teachings that promote seeking cure, require societies to care, support and implement skills utilization of affected people, with built-in principles to abolish discrimination and stigmatization of victims of disease.

(2) Acquiring scientific knowledge about HIV/AIDS and other STIs:

This knowledge includes causative organisms, epidemiology, world experience, mode of spread, prevention and treatment. It also includes proper use of condoms as means of partial protection in cases where husband or wife is already infected (in relations between husband and wife only), and not as a means of encouraging unethical, sexual relations (zina).

(3) Forming partnerships and collaborative relationships with religious and community leaders, to deliver sound education and counseling to the widest sectors of grassroots communities, aiming at promotion of ethical and sound behaviors, encouraging timely marriage, avoiding adultery, alcohol and drug abuse.

In South Africa, with a record of extensive HIV/AIDS prevalence, The Islamic Medical Association of South Africa, a FIMA member has adopted a HIV/AIDS prevention program since 1998[16], in collaboration with two other Muslim organizations, namely: Jamiatul Ulama and the Islamic Careline (sisters in a counseling service), under the umbrella of MAP (The Muslim AIDS Program), which has gained ground in most major provinces in South Africa, with constructive cooperation and understanding with the health authorities of the South African government.

Community awareness, life skills schools programs, training of volunteers, capacity building, home-based care, orphan and vulnerable children programs have been ongoing since 1998

The Muslim AIDS Program Care Center was established in July 2003, and accommodates females and children infected or affected by

HIV/AIDS. The two dimensions of action have been:
1- In order to prevent infection, we need to comply with Islamic injunctions: Islam has the cure.
2- For those unfortunate individuals who are infected. Increased levels of spirituality that draws people closer to their Creator, His mercy and forgiveness, goes hand in hand with medical and social care, in which stigmatization is properly avoided according to Islamic guidelines of caring of the infected and affected individuals.

In South East Asia, The Islamic Medical Association of Malaysia, a FIMA member has been active in raising public awareness of measures to combat HIV/AIDS, since 1998. Their main achievement was the establishment of homes for women and children living with HIV/AIDS[17]. Family life, rejuvenating of women' self-esteem and feeling of self worth are the mainstay of this activity. Children receive medical care, family-life happiness and education. Abandoned and orphaned children affected with HIV/AIDS receive various medical, social and educational care by dedicated experts. Other activities were conducted in Pakistan, Indonesia and other Asian countries. FIMA is planning to strengthen and widen these activities to include more countries and communities.

In the Middle East and North Africa, FIMA launched its program (Protection of Our Youth from Sexually Transmitted Infections and HIV/AIDS) since January 2006. The Program gradually expanded to cover many other countries in Africa and South East Asia.

The main aim of the program is to raise the general public awareness based on training of a satisfactory number of well educated, dedicated local community workers/leaders who will continuously and professionally work in their respective sectors of society, especially the youth sector. During the past 7 years, the program was able to design practical and well constructed condensed courses suitable to everybody, irrespective of educational background. So far, 127 teams were trained, each consisting of 70 - 90 local youth leaders, alternating male and female groups. So far the program graduated more than 10,000 well prepared workers in Jordan, Qatar, Bahrain, Sudan, Algeria, Morocco, Saudi Arabia, Lebanon, Yemen, Libya, Ghana, Malaysia, Indonesia, Nigeria, Turkey, Tanzania, South Africa, Tunisia and Australia. Government, charity, civil and social organizations discovered the value of this project and requested its widening and continuity.

Tanzania

Morocco

Bahrain

Malaysia

Trainees are volunteers from several sectors of society:

Imams.
Social workers.
Educators – Teachers.
Medical professionals.

Qualifications of Trainees:

University graduates.
Ready for voluntary work.
Interest in dealing with youth problems.
Ability to address the youth.
Ability to participate and lead in team work.

Training course characteristics:

Courses of up to six full days.
Comprehensive lectures.
Open discussions.
Case studies.
Printed materials and books.
Final workshop.
FIMA Certificates.

The Trainees receive systematic reviews on:

- STI[s] & HIV/AIDS information on the infectious organisms and modes of infection.
- International and local statistics.
- Protection activities conducted worldwide.
- Treatment and care of affected people worldwide.
- International reactions and attitudes towards the problem.
- Islamic teaching and guidance towards protection and management.
- Islamic Jurisprudence related to these issues[18].
- Islamic ways of protection.
- Islamic approaches to human Sexual desire.

Graduates are also equipped with a wealth of educational materials:

- Recordings of updated scientific and epidemiologic knowledge.
- Books published by qualified authors, about various aspects of this issue.
- References in Islamic guidance and Jurisprudence.
- Training in spiritual support.

Graduates are requested to give at least 10 lectures/presentations/seminars per year to his/her local youth community: schools, colleges, camps, clubs, youth centers, mosques.

So far 127 courses were accomplished. All courses were held in cooperation between FIMA and local civil, social, cultural and educational organizations. So far 10,000 males and females had graduated.

Special courses are conducted to prepare senior leaders/workers in various countries, to assume leadership to continue and develop this activity, and to function autonomously in their respective countries/communities.

The Way forward:

Reports published by UNAIDS, WHO,CDC and other professional organizations have illustrated an unrelenting global initiative to tackle

the HIV pandemic and the progress achieved thus far.

These efforts, however, are based on a Western worldview and ethical framework. Current international efforts to deal with the HIV pandemic depends mainly on core activities like condom use, provision of antiretroviral medications, provision of needles/syringes to drug users and funding of programs to minimize various types of transmission. Issues like promiscuity, heterosexuality, homosexuality, commercial sex, drug abuse and other behaviors, are regarded as accepted social trends and thus do not require any specific intervention programs.

The Western biomedical model is beset with various limitations due to its underpinning philosophy characterized by its materialistic world view and the marginalization of the spiritual and religious domain.

In the Islamic paradigm, based on the holistic Islamic teachings, HIV/AIDs is not considered as just a virus-induced disease, but rather a manifestation of a serious breakdown of socio-moral and behavioral norms afflicting human societies at varying degrees.

The injunctions of Islamic jurisprudence (Maqasid al-Shariah) are meant to preserve and protect the very essence of our humanity, namely religion (deen), life (nafs), mind (aql), progeny (nasl) and property (maal). The HIV/AIDS scourge annihilates mercilessly all these five purposes of Shariah. Millions have died, millions more are plunged into destitution as their body weakens, incomes dwindle, assets shrink and home and national economies are disintegrated. The family fabric is tragically dismantled as children are orphaned and young teenagers assume responsibility as household heads. The vicious cycle linking poverty, food insecurity, illiteracy and HIV/AIDS can only perpetuate further social upheavals leading to chronic disruption of barely coping health, welfare and education systems. And left unchecked, they constitute the ideal ensemble for a desperate humanitarian crisis.

Considering this complex equation, the Islamic approach presents a comprehensive and integrated response which prioritizes preventative strategies, provides therapeutics, care and support to the afflicted and their families and attempts to put in place long term macro-economic and social interventions to redress the socio-economic impact of the HIV/AIDS pandemic.

This Tauhidi paradigm is simply put a "back to basics" wholesome blueprint of action which espouses and celebrates the universal values of self discipline, chastity, morality, decency and family centricity.

FIMA's Youth Protection from HIV/AIDs and STDs educational program embraces these ethical values and disseminates a caring Muslim response to the pandemic based on the Islamic virtues of Rahmah (mercy), Maghfirah

(forgiveness), Ihsan (benevolence), Ukhuwah (brotherhood of humanity), Shifaa' (healing) and Iman bil Akhirah (belief in the hereafter).

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ENVIRONMENT AND HEALTH: ISLAMIC PERSPECTIVES ON MILLENNIUM DEVELOPMENT GOAL #7

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Abstract:

The Millennium Development Goals (MDGs) proposed by the United Nations address 8 vital issues, with intimate impact on human life, health and well-being. MDG #7 tackles the issue of environmental sustainability, and global cooperation to ensure healthy environment factors in these contemporary times of industrialization and other various pollutants, which were observed directly or indirectly by a wealth of scientific observations and studies, including climate changes, global warming, air pollution, droughts, floods, animal and plant life effects.

MDGs are legitimate Islamic goals, that are in compliance with Islamic aims and values.

The responsibility for adverse environmental changes lies on humans, as individuals, societies, governments, regional and international organizations. Effects of current trends in environmental and climate changes will be catastrophic if left to continue unabated. It is our shared responsibility to care for the ship, or else we will all suffer or sink.

Keywords:
Millennium Development Goals, Climate Changes, Global Warming, Environment, Health and Islam

Introduction:

Environmental health is defined by the World Health Organization (WHO) as: The aspects of human health and disease that are determined by factors in the environment[1]. WHO promotes the improvement of environmental parameters and encourages the use of environmentally friendly and healthy technologies and behaviors. WHO has a leading role in developing and suggesting new policy areas.

Human well-being and productivity are best achieved if exerted in harmony with nature.

Environment encompasses within its folds various elements including human beings, animal and plant life, together with earth, air and sea. In Islamic teaching, all these are included in the Tauhidi paradigm.

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Environment health factors are intimately interconnected with behavioral, socio-economic and genetic factors.

Human behavior is a major determinant of healthy environment. Contemporary lifestyle, industrial development and economic growth have led to tremendous improvement in people's standard of living, but with a significant toll on environment, which ultimately impact on human health, directly or indirectly.

Healthy populations are essential for economic development and productivity. Leadership is required to properly integrate environmental health practices, industrial development, lifestyle and environment, in genuine and sustained endeavors to strike a sound balance between economic development, health and the environment. Without that, polluted environment will eventually lead to disease, disability, and sufferings from exposure to environmental hazards. Individuals and societies will suffer from ailments that will eventually slow or even block socio-economic development.

Islamic guidance from the Glorious Qura'n and *Sunnah* of the prophet ﷺ provide sound principles of environmental health. Humans are guided to safeguard society benefits and environmental health by proper lifestyle and behavior. Muslims are enjoined to avoid corruption in land and sea, and to safeguard other creatures on this earth, plants or animals, that are described as "nations" like humans, and have vital roles on life on this Earth.

It is incumbent on Muslim believers to observe their daily behaviors and lifestyle, and to obey their Creator, to safeguard life, and avoid any kind of corruption that can end up into harm to oneself and society, in either the short or the long term. Even simple acts, such as removal of litter and harm from the roads of people, are encouraged and considered as acts of faith. This is exemplified by the Prophetic saying (*Hadith*):

"Faith (*Iman*) has more than seventy doors, the lowest of which is removal of litter or other harms from the road….."[2].

In Islam, all actions are based on the 5 Purposes of the Law (Maqasid al Shari'ah): preservation of religion (*diin*), life (*nafs*), mind (*aql*), progeny (*nasl*) and property (*maal*)[3].

Health is a major requirement that is addressed in at least 3 of the above Maqasid; life, mind and progeny, and its preservation is considered an act of faith (worship), with divine rewords.

Warning on the consequences of environmental corruption was referred to in the Glorious Qura'n in the verses: *"Corruption has appeared throughout the land and sea by (reason of) what the hands of people have earned (caused), so He may let*

them taste (suffer) of (consequences) of what they have done that perhaps they will return (to rightful paths)"[4].

Recent scientific progress provides us with new explanations of harmful effects of excessive or transgressive human behaviors in newer lifestyles and contemporary industrial advances.

Removal, or correction of harm and avoidance of transgression or overindulging are basic Islamic principles.

It is incumbent on Muslims, individuals and societies, to forge cooperation undertakings with all concerned, from any nationality, race or religion, to achieve this goal.

The United Nations Millennium Development Goals (MDGs) in general, and ensuring of environmental sustainability (MDG#7) in specific, are genuine Islamic goals. Misbehavior of humans, individuals, institution and governments, can adversely influence the environment making it harmful or even uninhabitable for this or future generation if the current trends are left unabated.

The aim of this review is to outline factors of environmental changes and some of their possible adverse effects.

The Environment and Climate Changes – Global Warming

We live on the planet Earth in an environment surrounding us (land, water, climate and radiation) that can be measured in terms of the temperature, air chemical structure, atmospheric pressure and other parameters. The Sun is the source of heat of earth's surface, and Earth's orbit around the sun with its tilt and rotations decides the amount of heat from radiation from the sun reaching it (Figure1). Earth's orbit is not a perfect circle. Earth is slightly closer to the sun in early January (winter in the Northern Hemisphere) and farther away in July. In January, Earth is 91.4 million miles (147.1 million kilometers) from the sun, and in July it is 94.5 million miles (152.1 million kilometers) from the sun. This variation has a far smaller effect than the heating and cooling caused by the tilt of Earth's axis[5].

The atmosphere of earth reflects almost one third of the arriving solar radiation on its higher layers. Earth's surface and the clouds reflex almost all of the other two thirds leaving 0.9 W/m2 (Watts per meter square) net absorbed from the 341 W/m2 normally. A substantial portion of 80 W/m2 can be trapped by the green house effects of the gases in the atmosphere which can vary markedly. Figure 2 summarizes the flows of energy from the sun reaching earth.

The composition of the atmospheric gases is largely fixed by the percentages of Nitrogen, Oxygen and Argon (78.1%, 20.1% and 0.93% respectively), while the percentages of Carbon dioxide (0.04 – 0.1%) and

water vapor (0.05 – 1%) percentages vary. This variation is for sea level atmosphere as altitude from sea level also causes changes in the concentrations of these gases. The greenhouse effect is due to CO2 and H2O mainly and CO2 becoming the major player at the poles of earth and on the desert land as water vapor becomes less. Air pollution at sea level also contributes to changes in the temperature depending on the type of pollutant. Sulfate and organic carbon lead to decrease in temperature while ozone and black carbon lead to rise in the temperature. Naturally occurring amounts of greenhouse gases have a mean warming effect of about 33 °C (59 °F). Without the earth's atmosphere the temperature across almost the entire surface of the earth would be below freezing. The major greenhouse gases are water vapor, which causes about 36–70% of the greenhouse effect; carbon dioxide (CO2), which causes 9–26%; methane (CH4), which causes 4–9%; and ozone (O3), which causes 3–7%. Clouds also affect the radiation balance through cloud forcings similar to greenhouse gases[6].

Climate change studies recording of daily temperature and the Carbon Dioxide level since 1880 till now show an alarming trend for rise of both parameters[5]. The pre-industrial revolution level of CO2 was 290 ppm (parts per millions) and currently standing at 360 ppm and in some areas reaching 600 ppm. This rise was associated with a parallel rise in the temperature of almost 1.5o F as shown in Figure 3. Although these changes seem minute at first glance but have drastic changes on the environment, and the main culprit for the increases is definitely the human behavior 6. Use of fossil fuel for travel or cocking and electrical energy production all have contributed to the phenomena of global warming and it is mainly from the industrial world as shown in Figures 6 and 7. It caused a drastic change on the polar Ice caps of earth. There has been 2.7% decrease each decade since the 1960's and a 7.8% decrease each summer as seen the satellite photo of the north pole between 1979 and 2007 seen in Figure 4. This led to a steady rise in the sea level. The sea level had risen at an average of 1.8 mm per year since 1961 and 3.1 mm per year since 1993. These numbers might seem minute for us but will definitely affect the whole earth in next generations to come. At this rate, if the sea level increases by few meters it will change the whole landscape of large areas of densely populated river deltas and sea shores affecting millions of humans. Figure 5 shows the most affected areas worldwide which are now at or slightly below sea level and will be vulnerable for disaster if the trend is not reversed or at least interrupted. The effects of global warming and pollution affect not only the natural systems (sea level and temperature) but also affect the ecosystems and force humans to adapt accordingly. These will affect the availability of fresh water and or food and will also

affect disease transfer. These effects can be abrupt or can occur at a large scale.

Health Effects of Climate Changes and Pollution:

There are many effects on the human life and health due to climate changes and pollution either directly or indirectly proven by studies and observations. It is impossible to list in a precise way all of the effects as they can be cumulative, slow or additive in their effects. The author wanted to draw attention to major effects and few examples of these effects from studies and reports on specific occasions. Some of the effects are postulations and predictions supported by common sense and logic.

Temperature Effects:

Excessive variation in temperature is associated with increased mortality and morbidity. Heat waves are associated with increased mortality as shown in many studies such as the 1995 Chicago heat wave. Figure 8 summarizes the sharp rise in the number of deaths with the rise in heat index[7]. There was a similar increase in the number of hospital admissions and emergency room visits. To a lesser extent low temperature waves are associated with illnesses such as upper respiratory tract infections. The effects are affected by the adaptation methods and the usual temperatures seen in the areas. Deaths associated with heat waves occur in temperate climate regions mainly of the elderly and sick people with cardiovascular and respiratory diseases.

Drought and Floods:

Worldwide drought cause more deaths than any other weather disaster. The main cause of drought is the lack of precipitation[8]. Drought is very relative to location because every place on the earth has a slightly different ecosystem and therefore drought affects each place differently. There are three different types of droughts. The first type is meteorological drought in which the precipitation is below average for an extended period of time. The second type is hydrological drought in which there is an unusual lack of groundwater in an area. The third type of drought is agricultural drought in which there is lack of moisture in the soil making crops unable to grow normally.

Water scarcity is a major concern for the future which possibly will result in wars on a small or a large scale. Figure 11 shows the global distribution of human populations relative to the amounts of available water. There is a belt from North Africa, Arabian Peninsula and Indian subcontinent with severe deficiency represented as deep red color 9.
On the other hand, excessive rainfall and topology of the ground and river

flows can lead to catastrophic results. The greatest flood recorded in recent years was in China in 1931 with the death of almost 3 million persons. Floods cause disruption in the fresh water supply and sanitation leading to epidemics in water borne pathogens.
In the United states, a country where there has been accurate statistics for a long time, alarming observations were made and similar conclusions can be extended to the rest of the world. The annual average of costs and losses from floods and hurricanes combined is less than the average annual costs and losses from drought. On average, drought causes $6-8 billion in losses and other expenses in the United States alone. Drought has caused mass migrations that have shaped the demographics of the United States. During the 1930s over 2.5 million people fled the Great Plains for the West Coast because the severity of the drought (www.drought.unl.edu). Drought not only affects humans but thousands of animals.

Plant and Animal Effects:
Animals and plants are also directly affected by the climate changes. Many observations are made of changes in the behavior of living organisms such as earlier spring activities or changes in the migrations limits of animals. Rising temperatures are beginning to have a noticeable impact on birds. Butterflies have shifted their ranges northward by 200 km in Europe and North America. Plants lag behind, and larger animals' migration is slowed down by cities and roads. In Britain, spring butterflies are appearing an average of 6 days earlier than two decades ago10 Possible health effects of these changes include changes in disease vectors like insects or rodents leading to newer diseases in newer places. There are definite changes in the plant cover with extinction of some species and the longer persistence of others. Plants are affected by the temperature, humidity, light exposure and even CO2 levels.
Plant cover changes or exposure to insecticides, herbicides or chemical fertilizers used in farming can lead to changes in the amount of food produced. There are changes in the toxicity of the certain plants such as contact dermatitis by exposure to poison Ivey in newer areas. The role of pollens of plants in allergic diseases such as allergic rhinitis, conjunctivitis or bronchial asthma witnessed significant changes. Plants grow bigger with more CO2 with more pollen amount production and increased duration of pollination and increased allergenicity of the pollens11.This was shown by many experiments on some plants like the Ragweed, because of its importance in North America as an allergic pollen producer.

Air Pollution:

Mounting evidence suggests that air pollution contributes to the large global burden of respiratory and allergic diseases, including asthma,

chronic obstructive pulmonary disease, pneumonia, and possibly tuberculosis. Although associations between air pollution and respiratory disease are complex, recent epidemiologic studies have led to an increased recognition of the emerging importance of traffic-related air pollution in both developed and less-developed countries, as well as the continued importance of emissions from domestic fires burning biomass fuels, primarily in the less-developed world. Emissions from these sources lead to personal exposures to complex mixtures of air pollutants that change rapidly in space and time because of varying emission rates, distances from source, ventilation rates, and other factors. Although the high degree of variability in personal exposure to pollutants from these sources remains a challenge, newer methods for measuring and modeling these exposures are beginning to unravel complex associations with asthma and other respiratory tract diseases. These studies indicate that air pollution from these sources is a major preventable cause of increased incidence and exacerbation of respiratory disease. Physicians can help to reduce the risk of adverse respiratory effects of exposure to biomass and traffic air pollutants by promoting awareness and supporting individual and community-level interventions[12]. A major factor in assessing the effect of the air pollution is the factor of the size of the pollutant represented as Particulate Matter size in micrometers. Coarse pollutants PM >10 micrometers lead to respiratory symptoms and lung functions impairment. Fine pollutants PM <2.5 lead to skin and eye symptoms or tumors when the pollutants are less than 1 micrometer. Ultrafine pollutants are associated with cardiovascular disease as shown in Figure 14.

The 2008 Beijing Olympic and Paralympic Games also evidenced a large natural experiment with abrupt cessation of ambient air pollution in China when its government implemented a short-term odd/even-day traffic-restriction scheme to improve the air quality in Beijing. The daily average concentrations decreased by up to 38.5% for CO, 44.0% for PM10, 33.9% for NO2, and 36.7% for O3 during this scheme. It was reported that the average numbers of outpatient visits for asthma were 12.5 per day at baseline and 7.3 per day during the Olympics. Compared with baseline, the Olympic Games were associated with a significant reduction in asthma visits (RR, 0.54; 95% CI,0.39-0.75). These results showed that even in a heavily polluted city, decreased small-particle exposures was associated with some reduction in asthma-related outpatient visits13. The cooperative effort of a community made a huge difference in the quality of air as seen in Figure15 for the same skyline for at 2 times before and after the measures were implemented.

Responses to the Climate Changes

and Controversies:

There is still debate about presence of global warming or its effects or the future directions in case the same trends continue. This debate occurred at the level of individuals and countries.In 2007–2008 Gallup Polls surveyed 127 countries. Over a third of the world's population was unaware of global warming, with people in developing countries less aware than those in developed, and those in Africa the least aware. Of those aware, Latin America leads in belief that temperature changes are a result of human activities while Africa, parts of Asia and the Middle East, and a few countries from the Former Soviet Union lead in the opposite belief. In the Western world, opinions over the concept and the appropriate responses are divided. The results showed the different stages of engagement about global warming on each side of the Atlantic, and that the debate in Europe is about what action needs to be taken, while many in the US still debate whether climate change is happening[6].

The global warming controversy refers to a variety of disputes, substantially more pronounced in the popular media than in the scientific literature, regarding the nature, causes, and consequences of global warming. The disputed issues include the causes of increased global average air temperature, especially since the mid-20th century, whether this warming trend is unprecedented or within normal climatic variations, whether humankind has contributed significantly to it, and whether the increase is wholly or partially an artifact of poor measurements. Additional disputes concern estimates of climate sensitivity, predictions of additional warming, and what the consequences of global warming will be.

In the scientific literature, there is a strong consensus that global surface temperatures have increased in recent decades and that the trend is caused mainly by human-induced emissions of greenhouse gases. No scientific body of national or international standing disagrees with this view, though a few organizations hold non-committal positions. From 1990–1997 in the United States, conservative think tanks mobilized to undermine the legitimacy of global warming as a social problem. They challenged the scientific evidence, argued that global warming will have benefits, and asserted that proposed solutions would do more harm than good[6].

The international efforts to develop a plan to deal with climate change resulted in trials to unify policies of different countries such as the Kyoto protocol, Copenhagen Accord and lastly the Cancun treaty. These efforts have to be ratified by the individual countries, but this did not happen even in major players like the United States which rejected the Kyoto

protocol because it harmed its economy disproportionately. Till now countries are behaving like individuals looking for their self interest instead of the benefit of the whole planet and that of the human race.

Conclusions:

It is clear that the cumulative effects of human actions have resulted in significant changes to our environment and human health. Unfortunately, the Islamic countries have participated lightly in the studying of these phenomena. Few studies or statistics come from them probably because of lack of awareness about the presence or seriousness of the problem and its priority.

The needed actions against this harmful trend vary from individuals to communities and from nations and international organizations. First there has to be awareness and acceptance about the problem then making modifications in the behavior from small scale to large scale interventions. Since the largest contributors to the greenhouse gases emissions come from fossil fuel burning in electricity generation, transportation and industry especially from the developed countries there also lies the largest responsibility in fighting these changes. Other small scale polluters include cooking and heating methods mainly affect the health of the exposed individual.

Interventions like turning off lights or air conditioning when unneeded to conserve electricity or use solar power for heating in houses or going by foot for transportation instead of use of cars can make a huge difference in the total picture. Better designs for industrial activities so as not to harm the environment are also needed in a collaborative effort to preserve the health, wealth and lives of the human race on Earth.

Acknowledgement:

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DIABETES AND CARDIOVASCULAR RISK: WHAT CAN WE DO?

Khalid Yusoff* and Aly Misha'l

Abstract:

Diabetes mellitus is a growing menace to the world's population, including those in low- and middle-income countries. Diabetes is one of the major risk factors for cardiovascular disease (CVD). It increases the risk for CVD and accentuates its complications, both in stable coronary artery disease and in acute coronary syndromes. Specific measures and targets have been proposed to mitigate the ravages of diabetes. But preventive measures, both primary and secondary (and even primordial), are initiatives which have yet to be fully utilized. Here, patients and those predisposed to diabetes, have to be engaged on an informed and sustainable basis, and so too civil societies, Non-governmental Organizations (NGO's), policy makers, professional bodies, educational establishment and employers. The task is great, the path is long and challenging, but the destination is well defined and, with much effort and luck, reachable. It needs all the resources, and everybody with a good heart and goodwill, to muster the efforts together.

Key words:

Diabetes, cardiovascular disease, prevalence, complications

Introduction:

The incidence and prevalence of diabetes mellitus are increasing throughout the globe, particularly since the second half of the last century. This reflects the socioeconomic development in many countries with its attendant lifestyle changes, increasing obesity and aging. Many studies and reports have consistently affirmed this outlook and pessimism. Wild at al[1] (Fig.1) estimated the increasing burden of diabetes mellitus throughout the world, in developed, and in developing countries comparing the situation in 2000 and what is expected in 2030. The increase seems to be particularly contributed by the developing countries, across all age groups.

Data extrapolated from this global prevalence study reveal the greatest relative prevalence of diabetes was in the Middle East.

In most developing countries, including Muslim majority countries

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(MMCs), the main drivers are urbanization with its lifestyle changes, altered diet, obesity, and decreased physical activity, which differ between urban and rural populations. It is estimated the prevalence in rural areas is less than half that in urban ones[2,3].

Age-specific prevalence is expected to almost double by the year 2030. In MMCs, similar to many other developing countries, the majority of people with diabetes are in the age group 45-64 years, in contrast to developed countries where the majority are in the age group above 64 years[4].

By 2030, it is estimated the number of people with diabetes above 64 years of age will be < 82 million in developing countries, compared to > 48 million in developed countries[4]. The growing public health burden, the human and economic cost of this epidemic are enormous.

To make the problem worse, two aspects of the epidemic have to be addressed:

1. Undiagnosed diabetes, representing 25-66% of the overall diabetic population[5]. This problem is expected to be more prevalent in MMCs.
2. Pre-diabetes, including the categories of impaired fasting glucose (IFG), and impaired glucose tolerance (IGT), with high risk for future development of diabetes, and increased risk of cardiovascular disease, hence, the importance of proper identification and adoption of prophylactic programs to prevent transition into diabetes[6].

A more recent estimate of the growing global prevalence of diabetes was published in 2011 by Whiting D et al from the International Diabetes Federation (IDF)[7].

Data published were from the 80 most populous countries (representing 94% of combined global population in 2011). For those interested in all the 216 countries of the world, they can visit www.idf.org/diabetesatlas .

The highest regional prevalence for 2011 was in the Middle East and North Africa (MENA). By 2030, Africa (AFR) will be the highest, followed by MENA. Over the period 2011-2030, the total number of people with diabetes is likely to increase by over 50%, largely due to urbanization[7], lifestyle changes, obesity and aging of populations.

Prevalence of diabetes among adults (20-79) years for the years (2011-2030)[7]:

Region	2011	2030
MENA	12.5	14.3
AFR (Africa)	5.0	5.9
SEA (South East Asia)	8.6	10.5
EUR (Europe)	6.0	7.1
World	8.3	9.9

Out of the Top 10 countries for diabetes adjusted prevalence in 2011 and 2030, some Middle Eastern countries have the following alarming figures[7]:

Countrv	2011	2030
Kuwait	20.7	23.4
Qatar	19.8	22.3
Saudi Arabia	19.6	22.3
Bahrain	19.5	22.0
UAE	18.8	21.6
Lebanon	19.6	23.4

The rate of increase in diabetes prevalence is inversely related to income status as classified by the World Bank[7]:

Income status	Rate of increase in diabetes prevalence
Low-income countries	92%
Low-middle income countries	57%
Upper-middle income countries	46%
Higher-income countries	25%

The largest increases are expected in the older age groups, in the low-and lower-middle income countries, where the increased prevalence is in the working age groups between 46-60 years, compared to high-income countries where the increased prevalence is mainly in people over 60 years of age[7].

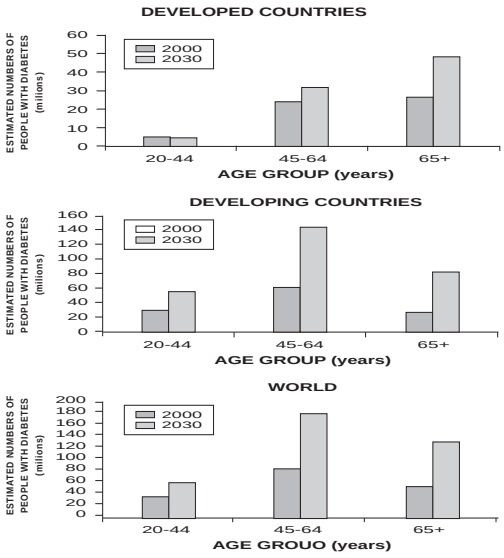

Fig 1. Wild S, et al. Diab Care 2004; 27:1047.Diabetes is a huge and growing disease burden globally, including the developing countries.

Surveys in some MMCs:

The prevalence of diabetes in Malaysia is also persistently increasing. The Ministry of Health conducts its epidemiologic studies called the National Health Morbidity and Mortality Surveys (NHMMS) which have provided conclusive evidence on this issue. The NHMMS are large community-based surveys carried out throughout the country and quite representative of the Malaysian population. However, even though these surveys provide data every 10 years (now every 4 years), these are derived from cross-sectional studies. Hence to provide further information, particularly related to causal factors, we are carrying out a relatively large longitudinal epidemiologic study involving 11 urban and rural communities in Peninsular Malaysia, Sabah and Sarawak involving a cohort of 12,465 adult individuals (age > 30 years) in the community (Fig.2). The participants would be followed up annually for 15 years. This study under the PURE / REDISCOVER Study was initially funded by the Ministry of Science, Technology and Innovation (Grant Number: 100-IRDC/BIOTEK 16/6/2 (13/2007) and now under the Long-term Research Grants Scheme of the Ministry of Higher Education (Grant Number: 600-RMI/LRGS 5/3 (2/2011).

Total Glucose data 11611	NORMAL* 9855 [84.9] *Normal (FG <6.1 mmol/L) + IFG (FG 6.1–6.9 mmol/L)				DIABETIC 1756 [15.1] Diabetes (FG = 7.0 mmol/L) + on medication			
	MALES AND FEMALES 9855	MALES 4165[42.3]	FEMALES 5690 [57.7]	p	MALES AND FEMALES	MALES 885[50.4]	FEMALES 871[49.6]	p
MEAN AGE	51.48±12.04	53.27±12.21	50.17±11.73	<0.001	56.08±9.90	57.15±10.01	55.00±9.68	<0.001
HYPERTENSION	4183 [44.2]	1934 [48.5]	2249 [41.1]	<0.001	1167[68.7]	596[69.2]	575[68.1]	<0.05
TOTAL HIGH CHOLESTEROL	2467 [25.3]	1106 [26.9]	1361 [24.2]	<0.01	708 [41.1]	336 [38.7]	372 [43.6]	<0.01
TOTAL HIGH LDL CHOLESTEROL	6024[61.9]	2628 [64.1]	3396 [60.4]	<0.001	1177 [68.6]	573 [66.2]	604[71.0]	<0.05
TOTAL HIGH TRIGLYCERIDES	4067 [41.7]	1932 [46.9]	2135 [37.9]	<0.001	1186 [69.0]	605 [69.7]	581 [68.2]	0.560
Reduced (below normal) HDL-c HDL < 1.00 mmol/L	2362 [24.2]	1501 [36.5]	861 [15.3]	<0.001	557[32.5]	350[40.4]	207[24.4]	<0.001
Overweight (BMI 23.00 – 27.49)	3629[38.5]	1670[42.2]	1959[35.8]	<0.001	619[36.5]	361[42.5]	258[30.5]	<0.001
Obese (BMI = 27.50)	2978[31.6]	1099[27.81]	1879[34.41]	<0.001	821[48.4]	361[42.51]	460[54.4]	<0.001
Increased WHR	5918 [62.9]	2231 [56.4]	3687 [67.6]	<0.001	1407 [83.2]	654 [77.0]	753 [89.4]	<0.001
CURRENT SMOKER	1203[13.0]	1065[27.2]	138[2.6]	<0.001	218[13.1]	207[24.81]	11[1.3]	<0.001

Table 1: Associated risk factors among participants with diabetes in the REDISCOVER Study

Urban areas and red rural areas. K.L. stands for Kuala Lumpur

Each participating individual provides a complete questionnaire on health and life-style including smoking and exercise, and undergoes health screening which includes physical examination (blood pressure, height and weight, waist and hip circumference measurement), ECG, echocardiography, pulse wave velocity and ankle-brachial index determination, while fasting venous blood is taken for various tests including measurement of glucose and lipids levels. In the 11,611 participants with blood samples, 1756 or 15.1% were found to have diabetes. The following table 1 shows that participants with diabetes often have other associated risk factors, which substantially increases their cardiovascular risk. This includes dyslipidemia, hypertension, and increased body mass. Thus a global risk reduction strategy is required in the management of diabetes. The days of attention to single risk factors for our community are really truly over.

In the Middle East, several epidemiological studies have been conducted. The experience from Jordan may be illustrative of significantly increased prevalence of type 2 diabetes, which is projected to worsen in the years to come.

In 2008, Prof. K. Ajlouni and his group at the National Center for Diabetes, Endocrinology and

Genetics, published a national survey from Jordan[8], which revealed ago-standardized prevalence of type2 diabetes and IFG to be 17.1% and 7.8% respectively. Compared with an earlier survey in 1994, there was 31.5% increase in prevalence.

In view of contribution of obesity in diabetes incidence, a population survey was conducted in Jordan, for men and women above 25 years of age[9], which demonstrated alarming rates of obesity of 53% in women and 28.1% in men.

For comparison of obesity (BMI $\geqslant$ 30 Kg/m^2) in some other countries, is listed from other countries:

- Saudi Arabia: 26.4% (men), 44.0% (women)[10].
- Iran: 16.2% (men), 34.9% (women)[11].
- Turkey: 15.1% (men), 51.0% (women)[12].
- USA: 27.5% (men), 33.2% (women)[13].

The prevalence of obesity varied greatly with age, increasing to a peak at the fifth decade.

Moreover, the study in Jordan revealed other associated comorbidities of diabetes, pre-diabetes hypertension and dyslipidemia.

With such a clinical topography, it is not surprising that diabetes has an impact on longevity. Fig. 3 shows that whilst there has been a decrease in total and cardiovascular mortalities between the periods 1950-1976 and 1976 – 2001 in both men and women, those individuals who had diabetes had higher mortality rates compared to those who did not have diabetes[14]. In fact, Haffner et al[15] has provided evidence that the prognosis of patients with diabetes who did not have cardiovascular disease (CVD) is similar to patients without diabetes who have experienced an acute myocardial infarction. Diabetes is thus a myocardial infarct (MI) equivalent with respect to prognosis.

The impact of diabetes can be seen in many specific conditions, many of which are predisposed to by diabetes itself. Viviotet al[16], for instance, in the TRITON-TIMI 38 Trial provided evidence of the impaired prognosis of patients with diabetes. They showed the impact of diabetes on patients who sustained acute coronary syndrome (Fig.4) where the incidence of myocardial infarction, stroke, bleeding and death is increased in patients with diabetes. The situation is further complicated by the observation that often the control of associated risk factors is much more difficult among patients with diabetes. Control of blood pressure[17], for instance, is generally poor but is worse in the presence of diabetes (Fig.5)[5].

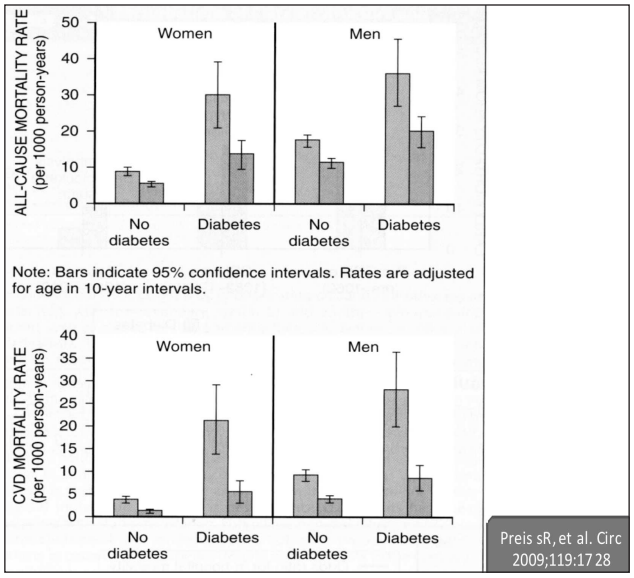

Fig 3. All-cause and CVD mortalities have improved in the period 1976 – 2001 as compared to the period 1950-1975. However diabetes gives a poorer prognosis as compared to those without diabetes.

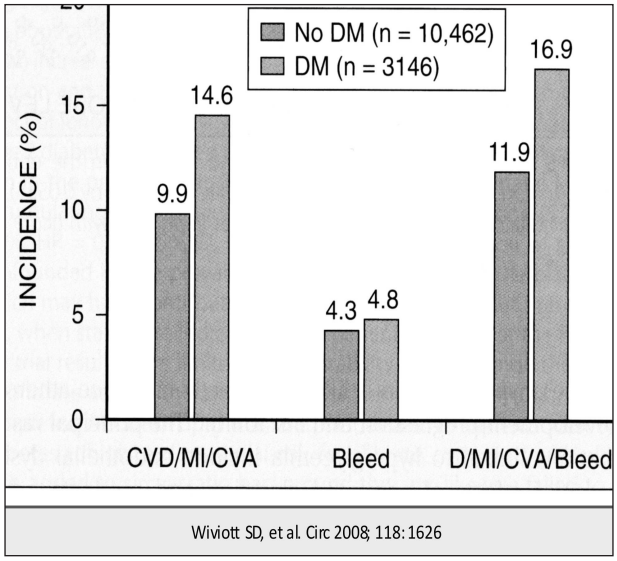

Fig 4: Adverse outcomes post acute coronary syndrome in patients with diabetes.

	Pre-JNC-7 (Jun 98– Mar 03)	Post-JNC-7 (Dec 03-Apr 06)	p value
N	15,359	2,012	
Mean age (yrs)	61.5	62.3	
Females (%)	56.2	65.0	
Hyperlipidaemia	52.4	59.5	<0.0001
Diabetes	22.1	27.0	<0.0001
BP control (%)	39.3	53.2	<0.0001
BP control w DM	16.7	29.2	<0.0001
No Rx	21.4	6.4	
Monotherapy	45.8	36.7	
Dual therapy	23.2	37.3	
>Triple therapy	9.6	19.6	
Diuretics	24.8	32.9	<0.0001
Beta-blockers	22.0	25.4	0.0007
ACE inhibitors	21.9	23.6	NS
CaCBs	20.9	23.6	NS
Fixed dose combo	10.1	26.7	<0.0001

Jackson, et al. AHA Circ 2006; 114: II - 828

Fig. 5. Blood pressure control among patients with diabetes is more difficult than in those without diabetes.

But despite all these data which provide compelling evidence of the poor prognosis of patients with diabetes, Yusuf et al[18] showed in the PURE Study that proven effective secondary prevention medications such as aspirin, beta-blockers, statins, ACE inhibitors and angiotensin-receptor blockers are not being widely prescribed for patients with diabetes even though they are widely available, and often affordable medications Thus there is a measure of therapeutic lethargy among the health professionals when it comes to patients with diabetes.

Whilst the general public may be aware of symptoms of "overt" diabetes such as thirst, polyuria, pruritus, mental cloudiness and loss complications of diabetes. Many individuals with diabetes go undetected, until complications of diabetes set in, often years later. In our REDISCOVER / PURE RUS Study, 35.4% of individuals with diabetes were unaware of their condition, until the health screening was performed. In the community, nearly 10% of the diabetics received treatment for their diabetes.

What need be done? What can be done?

The scenario painted above provides massive opportunities for intervention to significantly improve the overall situation, and thus provide an impact on this otherwise

increasing public health burden. Public awareness programs through the mass media or community activities have been done but the results have not been very encouraging as the diabetes prevalence keeps on increasing. Perhaps we need to change track; rather than focusing on the increasing trend, we need to provide information to the public what diabetes may mean to them individually. For instance, diabetes is the main cause of blindness world wide – what does it mean to be blind? Provide evidence that through prevention of diabetes, and better treatment for those with diabetes, eg, regular eye check-ups, improvement can be made. Renal failure is another major complication. What does it mean to have renal failure, and to require dialysis?. Same thing for stroke, heart attacks, heart failure, peripheral arterial disease, etc. Through this perhaps the public may have a better 'feel' of what diabetes is. Health check-ups should be made available and for those who have diabetes, a close focus on the delivery of care need be further streamlined. The health profession should also be on the vanguard against this invidious disease and be on the look-out for therapeutic lethargy and malaise. All these can be accomplished with minimal financial implications but with potential huge rewards in raising the standards of health care and in preventing health resources be spent on the complications of diabetes.

The following are general guidelines for concerned medical professionals, health authorities, non-governmental organizations, the media, school and university health planners. These guidelines are especially relevant to the Federation of Islamic Medical Associations (FIMA), and its member Islamic medical associations (IMAs) in various countries, as many of the developing countries are (MMCs), where most increasing prevalence of diabetes is taking place.

It is noteworthy that most risk factors of increased diabetes prevalence are modifiable, but need strong leadership in adoption of sound preventive strategies.

Guideline #1:

Public education by various community-wide activities, to promote healthy eating. Nutritional education should be included in school meal programs.

Guideline #2:

Promotion of physical fitness: programs directed to individuals, communities, school-university programs.

Guideline #3:

The media should be utilized to promote the above two guidelines, within their community or national culture.

Guideline #4:

Active and diligent programs, conducted at proper timing, to reduce transition of pre-diabetes into frank

diabetes, using early lifestyle and pharmacological interventions.

Guideline #5:
Our Islamic religious heritage of advocation of healthy eating, health and physical fitness. This wealth of Islamic guidance should be properly utilized by scholars, educators, mosque imams, preachers as well as the media.

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THE CARDIOVASCULAR EPIDEMIC WITH PARTICULAR EMPHASIS ON THE MUSLIM WORLD

Abdul Rashid Abdul Rahman*

Abstract:

Cardiovascular Disease (CVD) is a global epidemic and will continue to dominate global health for decades to come. The developing world is the epicentre of this epidemic and the Muslim world appears prominently in it. Even among countries in the developed world, Muslim communities tend to have a worse CVD risk profile than non Muslims. The reasons for these are not entirely clear but both inherent genetic predispositions and lifestyle factors contribute, the latter possibly contributing more. The irony is that the Islamic traditions both in the Quran and in the *Hadith* contain valuable advices and guidelines on healthy lifestyle which if practised can stem the tide of the cardiovascular epidemic in the Muslim world and beyond . It is important that both at the individual and societal levels the scourge of CVD be confronted. Efforts must be in place to ensure that Muslims are aware of contributing risk factors to CVD. This should encourage early screening, and when indicated appropriate evidence- based pharmacological intervention over and above lifestyle modifications. Muslim nations must have clear plan of actions if this epidemic , which is responsible for many premature mortality and morbidity , is to be curbed, in shaa Allah.

Keywords:

Cardiovascular disease, lifestyle factors, developing countries.

Introduction:

Cardiovascular Disease (CVD) is a global epidemic. It is the leading cause of death worldwide and more importantly contributes to most of premature death, especially in the developing world. Over the next two decades the prevalence of CVD has been projected to double in the developing world. The main reason for this reality is the projected increase in the prevalence of cardiovascular risk factors which leads to cardiovascular diseases. In the most world's populous nation, China, elevated blood pressure has been identified as the leading cause of premature death[1]. This increase in prevalence of cardiovascular risk factor profile in the developing world has in a major way contributed by the adoption of a more westernised life

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style and habits. This includes sedentary lifestyle, increased consumption of western style fast food with high saturated fat content and smoking. These plus the relative lack of resources allocated for health spending in many developing world will inevitably lead to further health burden to the society.

The Muslim world consists of over 1.6 billion people. Although the Muslim land is mainly confined to countries between the Atlantic Ocean in the west and the South China Sea in the east, Muslim communities are now present in almost all corners of the world from the northern most tip of Canada to South Africa, Argentina and Australasia.

With very few exceptions, most countries in the Muslim world are classified socio-economically as under developed or developing, collectively defined by the World Health Organisation as Low and Middle Income Countries (LMIC). The cardiovascular burden is ubiquitous among the Muslim population. Even in the newly developed Muslim world (High Income Countries), cardiovascular risk factors and cardiovascular diseases are on the rise. This is in contrast with non-Muslim developed world where cardiovascular disease is no longer the main cause of death being overtaken by cancer[2]. This short article will explore the extent of the cardiovascular epidemic in the Muslim world, the possible explanations and propose some measures which may *Insha' Allah (God Willing)* stem the tide of cardiovascular diseases in the *ummah* (society).

Health and the Muslim World:

In terms of life expectancy, no country in the Muslim world made it to the top 30 according to data from the United Nations for the period from 2005-2010. The United Arab Emirates has a life expectancy of 78.7 years, the highest in the Muslim world but is ranked 31st in the world. According to the United Nations[3], only three other Muslim nations made it to the top 50 , Kuwait (77.6 years ranked 41st), Brunei (77.1 years ranked 43rd) and Albania (76.4 years ranked 45th). Life expectancy estimate for 2011 ,according to the American Central Intelligence Agency (CIA) also did not list any Muslim nations in the top 30 and listed only 1 Muslim nation in the top 50 (Bosnia Herzegovina ;78.8 years at number 45) followed by with Kuwait with a life expectancy of 78.15 years at a lowly 52nd position[4] . There have however been important improvements with some success stories from the Muslim world,[5] but more needs to be done to improve the health profile of Muslim nations. Realising this, the Organization of Islamic Cooperation (OIC) had in 2005 released a document which will act as a blue print of action for the 21st Century to tackle the various problems that are being faced by the *ummah,* including that on health issues[6].

Cardiovascular Disease in the Muslim World:

Latest available statistics from the World Health Organisation (WHO) shows that death from cardiovascular diseases is the number one cause of mortality. It constitutes 30.5% of all deaths worldwide. Countries in the Eastern Mediterranean, South and South Asia and the Western Pacific are the biggest contributors to CV death [7]. These are also the regions where the majority of the Muslim population in the world resides. South and South East in particular have close to three quarters of a billion Muslims, more than any other region in the world. The region is the second biggest contributor of CV death second only to the Western Pacific Region where China contributes the most. South Asia itself contributes to the highest CVD burden compared to other region globally[8]. In the EUROASPIRE survey, data from Turkey showed important differences between herself and other European countries. There were younger patients with myocardial infarction; the smoking rate was higher with a lower HDL C levels[9]. Indonesia, the most populous Muslim country is undergoing an epidemiological transition with cardiovascular disease challenging infectious disease in disease burden[10]. In the meanwhile, stroke in the Arab world though not as prevalent as in Western World is similar to that of China[11].

Cardiovascular Risk Factors in the Muslim World:

There has been a dearth of published good quality prospective data from the Muslim world as regards cardiovascular risk profiling. Malaysia arguably leads the Muslim world in this respect because since the early 1980s cardiovascular disease had been recognised as the leading cause of mortality in the country and was projected to remain so well into 2020. One of the steps taken by the Ministry of Health was to commission periodic survey of the status of cardiovascular risk factors among the Malaysian population. So far 3 nationwide surveys have been conducted over 3 decades, called collectively the National Health and Morbidity Surveys 1,2 and 3 done in 1986,1996 and 2006 respectively. These surveys involving at least 20 000 respondents in each survey showed a worrying trend. All major cardiovascular risk factors showed an increase in prevalence except for smoking where the prevalence had dropped slightly from 1996 to 2006 (from 25% to 22%) but with a worrying trend of more adolescent smokers especially among females[12]. The biggest relative rise in prevalence from 1996 to 2006 was seen with diabetes (80%) followed by obesity (63%) and hypertension (29%). Similar studies looking at national temporal trends in CV risk factor profile from other Muslin world is unfortunately lacking.

Cardiovascular risk factors profile in

other Muslim countries is also a cause for concern. In the Arab world, risk factors like central obesity is not only alarmingly high among the affluent countries of the Gulf states but also in the less affluent Arab world of North Africa[13] . In Western countries, Muslims migrants have higher prevalence of cardiovascular risk factors not only compared to the native population,[14] but also compared to non-Muslim migrant population[15] . The same group of researchers have also demonstrated that Bangladeshi in UK have the worst CV risk profile compared to other migrants from South Asia [14]. There were also more baseline ECG abnormalities suggesting more prevalent silent coronary artery diseases among South Asian migrant population compared to European [16] migrants. In Western Europe (outside the UK), although quality data is lacking, CV risk profile tends to be worse among Muslim migrants compared to the local population[17].

The increased burden of CVD among Muslims and that of the Indian Subcontinent in particular can be explained by the higher prevalence of traditional risk factors and not due to ethnicity *per se* [18] . In Pakistan, the risk of cardiovascular disease appears to be similar between male and female, contrary to conventional thoughts[19]. This is partially attributed to the greater prevalence of hypertension among women and observation which is also seen in Malaysia where Malay women (almost all Muslims) have the highest prevalence of hypertension[12]. Cross sectional study from Egypt on the other hand demonstrated that the urban population demonstrated more adverse cardiovascular risk compared to rural folks [20]

Intervention programmes in the Muslim Community:

This year in the month of September, the United Nations' General Assembly will be highlighting the importance of a global strategy to combat non – communicable disease in general and cardiovascular disease in particular. Several stakeholders and interest groups have already started initiatives which will cut across borders in this noble effort at combating premature CVD worldwide. They include important scientific community like that of the Lancet NCD Action Group and the NCD Alliance [21]. Unfortunately despite CVD being a major problem in the Muslim world , no Muslim country is directly involved in many of these initiatives. One of the few Muslim countries which has taken the initiative is Malaysia which recently launched its own National Action Plan on Non-Communicable Disease[22] . The Gulf States realising that they are sitting on a CVD 'time bomb' have also taken some positive steps in curtailing the rising tide of CVD. This is well exemplified by efforts made by the United Arab Emirates [23]. The bidirectional 'top down 'and 'bottom up' approach by Abu Dhabi is an interesting initiative

to look forward to and to emulate. It also aspires to develop CVD risk scoring systems which are more suited to the Muslim population. If proven successful, this model can be extended not only to other Muslim countries but also to other low and middle income countries. The "bottom up" approach is particularly important because it is ironic that despite the affluent lifestyle enjoyed by its population, residents in the Gulf States demonstrated poor knowledge on important aspects of CVD [24]. What is most shocking was that knowledge was poorest among those with the highest risk. The same trend is seen among Muslim migrants to developed countries where Muslims (particularly of Bangladeshi origin) demonstrated poorer awareness of CVD than other South Asian migrant population[25].Any meaningful intervention programme to be implemented should ideally be done early as is being undertaken in Turkey [26].Muslim nations and Muslim communities must realise that CVD is a major problem within their midst and if left unchecked will lead to many more premature morbid and mortal events. The evidence as discussed above is overwhelming and consistent. As such remedial measures must be instituted by all concerned. These will have to be multipronged, integrated and concerted. The scope of remedial measures to mitigate this epidemic is wide and must involve all relevant stakeholders from the publicto the health care providers, governmental and non-governmental organizations. While it is tempting to repeat successful intervention models adopted in Western population like that of Scandinavia and the United Kingdom, issues peculiar to the Muslim *ummah* must also be addressed. The Organization of Islamic Cooperation (OIC) despite having a fairly well written blueprint of action[6] did not seem to cover the issues of health in general and CVD in particular. This will have to be rectified. In the meantime, all relevant stakeholders, including researchers, must play their role with some urgency. Researchers should identify gaps in knowledge on aspects of CVD unique to our populations. These may include the role of spirituality in CVD and adoption of an Islamic intervention programme involving religious leaders to spread the message of health and its link to spirituality. There is almost no research on this topic in the Muslim world, at least in published English literature, but others have published works which are intriguing and need further verification[27]. While it may be unsuitable to subject elements of *iman (faith)* to experimental curiosity, nevertheless it's potential in the healing process must be adopted as part of the holistic approach in tackling CVD.

Important hindrances to implementing intervention programme must be identified. One such hindrance is the availability and affordability of proven intervention methods. A survey commissioned by

WHO on essential medicine in selected low and middle income countries showed that treatment for cardiovascular disease is not widely available and not generally affordable especially in Bangladesh and Pakistan[28]. This is particularly so in the public sector. In terms of affordability, standard treatment for coronary artery disease in private sectors will cost a patient in Bangladesh equivalent to 1.6 days' wage while in Pakistan 5.4 days' wages. Malawi registered the worst result on affordability which was 18.4 days' wage! It is however important to note that in affluent Muslim countries like Qatar, despite availability of modern treatment to treat myocardial infarction, the utilization rate is not optimum . What is even intriguing was that the acute response to therapy is not as good among local Qatari as that of the immigrant population[29] . This is in contrast to observations in the West where the short term mortality rate is higher among migrants (mostly Muslims) compared to locals[30] . Long term mortality rate, on the other hand, is comparable to local population[31].

Observations from the Asia Pacific region remind us that it is important to monitor the effect of urbanization on cardiovascular risk profile[32]. Just like the Asia Pacific region, the other bloc of Muslim countries like the Eastern Mediterranean has also indentified regional approaches to tackle cardiovascular diseases[33]. Intervention programme that is to be instituted must also take into consideration cultural background of the targeted population. Evidence from Netherlands, however rather surprisingly showed that intervention programme designed for Turkish immigrants conducted by female Turkish educators failed to improve diabetes control and CV risk profile[34]. Dutch diabetic patients unlike Turkish immigrants benefitted from clinical practice guideline driven intervention[35] . This may suggest that in Muslim immigrant communities, intervention programme needs to also be gender specific and not just ethnic specific. It is also disturbing to note that intervention among deprived immigrant population in the Netherlands as a whole failed to demonstrate any form of benefit on CV risk profile[36].

Reasons for these disappointing observations must be investigated so that future intervention programmes may demonstrate more favourable outcomes.

Cardiovascular Risk Reduction – Pearls from the Islamic Teachings:

Health is an integral part of the Islamic teaching. The Holy Qur'an clearly states that "*Whoever saves the life of a person, it is as if he had saved the life of all mankind*"[37]. Prophet Muhammad 's (PBUH) written traditions (*Ahadith*) contain important advice on health[38]. The Islamic Divine Law (*Shari`ah*) was revealed to protect the best interest of humans on earth[39] . It places five foundational goals of the Divine Laws ( *Maqasid al-Shari`ah*)

of which protection of Life (*Hifz al-Nafs*) is second only to the protection of Religion (*Hifaz al-Din*). To achieve the goals of the Islamic *Shari`ah*, important principles or legal maxims are laid down[40] (*Qawa'id al-Shari`ah*) . Many of these principles (*qa'idat*) have direct application to health . These include principles of intention (*qa'idat al-qasd*), principle of certainty (*qa'idat al-yaqin*), principle of injury (*qa'idat al-darar*), principle of hardship (*qa'idat al mashaqqah*) and principle of custom (*qa'idat al-`urf*).

The heart has a special position in Islam. The Prophet said in a famous hadith "Beware, in the body there is a piece of flesh; if it is sound, the whole body is sound, and if it is corrupt, the whole body is corrupt, and behold, it is the heart." [41].

Although this *hadith* specifically talks about the spiritual heart, the same principle can be applied to the physical heart. Early Muslim physicians like the illustrious Avicenna (*Ibn Sina*) had outlined important principles of cardiac diseases. Indeed *Ibn Sina* was the first physician to point out the relationship between cardiac disease and psycho-social make- up of an individual[42]. *Ibn Sina* pioneered the field of cardiovascular therapeutics with detailed description of drugs for the heart, their indications and contra-indications[43]. Books on health incorporating prophetic traditions were also written after the golden era of Muslim contributions to medicine . The most famous being books written by Ibnul Qayyim Al Jawziyyah and that of Jalaluddin al-Suyuti, both entitled the Prophetic Medicine (Al-*Tibb al- Nabawi*) . Although both authors did not specifically elaborate on treatment of cardiovascular disease, however, they included tips on healthy lifestyle from the prophetic traditions[44.45].

Many of what we now know about healthy lifestyle to prevent CVD have roots in the Islamic tradition. The Holy Qur'an clearly states that Muslims should not only eat what is allowable (*halal*) but also what is *halal* and good for health (*halalan tayyiban*)[46]. The Holy Qur'an also advocates moderation in whatever we do and not to be extravagant including when it comes to eating[47]. When eating, the Prophet (PBUH) advised Muslims to eat in moderation[48]. The Islamic teaching also encourages us to be healthy as the Prophet (PBUH) said, "A strong Muslim is better than a weak Muslim, but there is goodness in both". The Prophet also encouraged us to walk in a dignified manner in a way described as *Hauna*[49] which was interpreted by the famous commentator of the Holy Qur'an, Ibn Kathir , as walking downhill with firm steps[50] or brisk walking. The Prophet (PBUH) himself is an epitome of health. At an age well pass his 50th birthday, he could still engage himself in a running race with his wife Aishah (RA) who was still a teenager and beat her at it. The practice of siesta, a Muslim tradition also known as *Kaylulah* , has been linked to

positive effects on CV profile[51] and CV mortality [52] . Interestingly, a recent study showed that the effect of intermittent energy restriction for two days a week produced similar CV benefits than that of continuous energy restriction for the whole week over a six month study period.[53] Muslims are encouraged by the Prophet (PBUH) to fast two days a week on Mondays and Thursdays and from this practice, recent evidence has shown that it may help reduce CVD risk in the long run. Recent animal study also gave insight into the mechanistic benefits of intermittent fasting on CVD protection[54].

Conclusions:

Recognised epidemic CVD may be new to the ummah, but its presence is not. Metabolic syndrome was prevalent among the affluent even in pre-modern era55. In contemporary times, however, it is not confined to the affluent among us. With the epicentre of the CVD epidemic poised to remain within the Muslim countries and Muslim communities for the foreseeable further, efforts must be initiated to systematically and strategically tackle this epidemic. Hopefully this short article will at least help to trigger some realization on the importance of closing the CVD Pandora's Box which had been unleashed for some decade now.

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CARDIOVASCULAR RISK FACTORS ARE ON THE RISE IN DEVELOPING COUNTRIES

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Abstract:

Global health surveys, over the past three decades, have revealed pandemic proportions of increased prevalence of obesity, diabetes, hypertension, dyslipidemia and sedentary life styles.

All these modifiable disorders are associated with significant escalation of cardiovascular morbidity and mortality, with deleterious health and socioeconomic consequences.

Unexpectedly, these cardiovascular risk factors are on the rise in developing countries while they are declining in high-income Western countries.

Moreover, community studies in several Middle-Eastern and North African regions have been indicative of increased risks for cardiovascular diseases among younger age groups.

All these risk factors can be modified by education and lifestyle interventions.

This presentation will address community-wide health promoting efforts aiming at public awareness and compliance with various aspects of lifestyle modification and early intervention.

Such efforts should include leadership roles of all concerned, including medical professionals, health authorities, educational systems, religious guidance systems, community non-governmental organizations and the media.

Key words:

Obesity, diabetes, cardiovascular risk, lifestyle modification.

Introduction:

A significant number of global health surveys, over the past three decades, has revealed stark, unexpected findings. Cardiovascular risk factors are on the rise in developing countries, including several Arab and Muslim countries, while they are declining in high-income Western countries.

Worldwide, 80% of cardiovascular induced-deaths took place in low-and

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middle-income countries [1-2].

Deaths from cardiovascular causes are attributable to few modifiable risk factors, including hypertension, dyslipidemia, obesity, diabetes, smoking and sedentary lifestyles.

The Global Burden of Metabolic Risk Factors of Chronic Diseases Collaborating Group analyzed trends of change in 3 leading cardiovascular risk factors and reported the findings in 3 studies.

The first study addressed global trends in body-mass index (BMI), from 1980 to 2008, and included 199 countries. BMI has increased steadily by 0.4 Kg/m^2 per decade, in almost all countries, but the maximum increases were in several countries, including the Middle East and North Africa (MENA)[3], all of which are Muslim majority countries (MMCs).

The second study addressed global trends in systolic blood pressure (SBP), also from 1980 to 2008. Although, on average, SBP has decreased in high income countries in Australia, North America and Western Europe, it has increased in many low-income and middle-income countries, including (MMCs)[4].

The third study addressed global trends in serum total cholesterol from 1980 to 2008 [5].
In high-income regions, represented by Australia, North America and Western Europe, there was about 0.2 mmol/L decrease per decade for both men and women. In these regions, total cholesterol decreased from previously high levels.
These findings were also supported by a health examination survey reported by the World Health Organization (WHO)[6].
In developing countries, including MMCs, cholesterol levels were rising.
These findings should be analyzed taking in consideration the differences in screening programs, statin use, and national education programs which are more widely implemented in high-income regions. As expected, higher serum lipids are inevitable consequences of economic development and urbanization. These factors have been later offset through healthier diets and widespread statin use in these countries.

In North Africa and the Middle East there was little evidence of change in total cholesterol.
In Jordan, and in other neighboring Arab countries, several community studies have been conducted that involved the above three parameters, in addition to other significant cardiovascular risk factors, especially diabetes, smoking and exercise[7].

Diabetes has been associated with an average 10 years of life lost for individuals diagnosed during middle age [8].
In the USA, the National Center for Health Statistics (NCHS) conducted a

nationwide survey that included 242, 383 adults[9], as part of an ongoing survey of health status, health care access and behaviors.
It reported that Cardiovascular Disease (CVD) mortality rate, associated with diabetes decreased by 60% from 1997 to 2006.

This decline of CVD mortality in diabetics was also encountered in several Western European countries.

Physical activity/exercise-induced increase in fitness predicts improvements in cardiovascular risk factors in subjects with type2 diabetes, independently of weight loss[10].

In Jordan, and similarly in other Middle Eastern and North African countries, around 30% of people, aged over 25 years, have overt diabetes or pre-diabetes, with high consequences from the health and socioeconomic aspects[11].
Other community studies in Jordan, included prevalence of obesity/overweight, smoking and levels of physical activities. Outcomes of all these studies were indicative of increased risks for cardiovascular diseases that affect younger age groups as compared to these groups in Western countries.

Limited access to medical care is one major barrier to effective control of risk factors. Only a minority of people, diagnosed with one or more risk factors, achieve targeted treatment outcomes.

One problem in low-and middle-income societies is that diagnosis of risk factors is usually late, and when medical management is started, it is often suboptimal.

The consequences of these observations are massive increases in cardiovascular morbidity and mortality, together with marked increased cost on individuals and the state.
These serious trends, if not met with proper and swift interventions, will intensify year after year.
The irony is that all these risk factors of cardiovascular mortality/ morbidity can be modified by education and lifestyle interventions.
Strong leadership in public health is needed to adopt sound preventive strategies.
One example of such leadership has been adopted in the United States: The 2010 Dietary Guidelines for Americans, the federal government's evidence-based nutritional guidance to promote health through improved nutrition and physical activity[12]. The guidelines were released in February 2011. They emphasize professional as well as public education to enhance healthy dietary choices and healthy lifestyles.

Here are some tips provided to help consumers translate the Dietary Guidelines into their everyday lives:

- Enjoy your food, but eat less.
- Avoid oversized portions.

- Make half your plate, composed of fruits and vegetables.
- Switch to fat-free or low-fat (1%) milk.
- Compare sodium content in foods like soup, bread, and frozen meals, and choose the foods with less sodium.
- Drink water instead of sugary drinks.

All concerned, including medical professionals, health authorities, community non-governmental organizations and the media, should work diligently to decrease the burdens of cardiovascular risk factors, which are all modifiable.

Community-wide efforts need to be directed towards increasing physical activity and changing dietary habits:

- Increasing the safety of streets and playgrounds: Resources for that must be provided, to encourage walking.
- Nutritional education on individual and national levels.
- Increasing physical activity for all citizens should be shared by schools, community organizations and places of worship.
- Enhancement of physical education should be a priority of the school systems.
- School meals should be monitored to provide healthy choices for students.
- Vending machines in schools should not provide high-caloric beverages and snacks.

In our Muslim societies, there is a wealth of religious heritage related to food and physical fitness.
This valuable heritage should be properly utilized by religious leaders, imams, the media, the school systems and medical practitioners in a persistent and continuous effort to encourage and maintain healthy lifestyles.

The World Health Organization (WHO)-Eastern Mediterranean Region, adopted the Islamic guidance in a 1995 publication, titled: (Amman Declaration for Health Promotion by Following Islamic Lifestyle)[13], which became a significant reference in this

ISLAMIC GUIDANCE IN FOOD, HEALTH AND FITNESS

In the Glorious Qur'an and *Sunnah* of the Prophet (PBUH), and other Islamic heritage, there is a wealth of guidance related to healthy lifestyle, eating habits and physical fitness. Only few pertinent Verses and *Hadiths* will be mentioned here, which could be extremely instrumental in counseling, preventive efforts and public campaigns aiming at combating lifestyle-related medical dilemmas. The Qura'n says:

"وكلوا واشربوا ولا تسرفوا إنه لا يحب المسرفين"

" ... and eat and drink but waste not by extravagance, certainly He (Allah)

likes not those who waste by extravagance"[14].

.Prophet Muhammad ﷺ said:

"ما ملأ ابن آدم وعاءً شراً من بطنه، بحسب ابن آدم لقيمات يقمن صلبه، فإن كان لا بد فاعلاً، فثلث لطعامه، وثلث لشرابه وثلث لنفسه"

"The son of Adam has never filled up a vessel worse than his stomach. For the son of Adam it is enough to eat few bites to support his body, and when he is going to eat, he should allocate one third (of his stomach) for his food, one third for his drink, and one third for his breath"[15].

In another *hadith* the Prophet ﷺ said .

"المؤمن يأكل في معي واحد، والكافر يأكل في سبعة أمعاء"

"The believer eats in only one bowel (stomach), and the non-believer eats in seven bowels"[16].

Another *hadith*:

"ولقد ذم الرسول (صلى الله عليه وسلم) قوماً من صفاتهم أنهم يحبون السّمانة، (والسمانة هي السمن).

The Prophet ﷺ dispraised (considered blameworthy) those people characterized by being fat (or they like to be fat)[17].

In another *hadith* Prophet Muhammad ﷺ said:

"إن بعدكم قوماً يخونون ولا يؤتمنون ويشهدون ولا يستشهدون، وينذرون ولا يفون ويظهر فيهم السمن". وفي رواية أبي داود (رقم ٤٦٥٧) .... ويفشو فيهم السمن".

"After you, people will come who will betray and who will be not trustworthy, who give testimony but will not be cited (or asked to give testimony), who make pledges (or a vow) but never fulfill, and obesity will show up among them"[18].

And as narrated by Abu Dawoud "and obesity spreads among them". In this *Hadith*, obesity is listed together with other serious vices and behaviors.

In a different *hadith* the Prophet was reported to have said

"ثم يأتي قوم من بعدهم يتسمنون ويحبون السِمن ويعطون الشهادة قبل أن يسألوها"

"And after them, people will come, who work to get obese, who like to be obese, and who provide testimony prior to being asked for it"[19].

In another *hadith* by the Prophet ﷺ:

وروى ابن ماجه عن أنس بن مالك رضي الله عنه، قال: قال رسول الله (صلى الله عليه وسلم): " أن من الإسراف أن تأكل كل ما اشتهيت ".

"It is out of extravagance (waste) to eat all what you desire (or crave for)"[20].

In a *hadith* narrated by Muslim, through Jaber (The Book of Food):

و روى مسلم في صحيح. كتاب الأطعمة. عن جابر رضي الله عنه. قال رسول الله (صلى الله عليه وسلم): "طعام الواحـــد يكفي الاثنين. وطعام الاثنين يكفي الأربعة".

"The food (nutriment) of one person is sufficient for two, and the food of two is sufficient for four persons"[21].

وروى ابـــن ماجه في ســـننه-كتاب الأطعمة- عن أم أيمن رضي الله عنها، أنها "غربـــلت دقيقـــاً فصنعته للنبي صلى الله عليه وسلم رغيفاً، فقـــال: ما هذا؟، قـــالت: طعام نصنعه بـــأرضنا، فأحببـــت أن أصنع منه لك رغيفاً. فقال: رديه فيه ثم أعجنيه.

Ibn Maja in his Sunan, book of food, narrated through Um Ayman that she sieved the flour to remove the bran (fiber), in preparation of a loaf of bread for the Prophet ﷺ. The Prophet asked: What is this? She said: This is food we make in our land, and I wanted to make from it loaf of bread for you. He said: Return it (the bran) back, then mixed it in a dough[22].

Comment: The Prophet ﷺ instructed her to keep the bran in the flour, in the preparing of bread. More than fourteen countries later, the medical profession discovered the importance of bran and fiber in proper dieting.

From our Islamic heritage, and wisdom derived from the prophetic guidance, Omar, the Caliph (a student of the Prophetic lifestyle), said: "Beware of gluttony (overeating), it is a cause of decay to the body, a source of illness and a cause of negligence (laziness) towards prayers, seek moderation and stay away from extravagance (excess waste)…"

Imam Shafi`i said: "Filling the stomach begets heaviness of the body, cruelty of the heart, decay of intelligence (cleverness), imposes sleep, and weakness from worship"[23].

There is a well known traditional health statement. "The stomach is the origin of sickness and dieting is the mainstay of cure"[24].

PHYSICAL FITNESS

Physical fitness and exercise has been stressed in Islamic teachings.
Allah (SWT) says:

"إن خير من استأجرت القوي الأمين"

"The best of men for you to hire is the strong the trustworthy"[25].

The Prophet (ﷺ) said:

"إن لجسدك عليك حقاً".

"Your body has a right upon you"[26].

And in another *Hadith*:

"المؤمن القوي خير وأحب إلى الله من المؤمن الضعيف".

"The strong Muslim is better and more loved by Allah than the weak Muslim"[27].

Omar, the second Khalifa, wrote to the people of Sham (Syria): Train your children to practice swimming, throwing (flinging, shooting) and order them to jump up swiftly on horses.

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19. Tarmithi #2222.

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27. Sahih Muslim #2664.

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