Health Ecosystems

Images of Coronavirus (COVID-19)

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The IOCOM Digest and Dialogue (IDD) is to be recognized as a world class outcome management Journal/Periodical.

IDD Mission
IDD’s Mission is to provide useful, timely and thought-provoking content in outcome management driven disciplines that addresses a broad spectrum of practices for knowledge exchange among academicians, researchers and practitioners.

IDD Objectives
1. Bridge the gap between academicians and practitioners in the discipline of outcome or benefit management
2. Provide a platform to academic researchers and practitioners for disseminating their research work.
3. Promote adoption of innovative outcome or benefit management disciplines
4. Highlight challenges being faced by the outcome managers (practitioners)

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1. The IDD journal will cover application of the cross cutting themes of Outcome management disciplines. No other journal in the world is having such orientation.
2. IDD journal’s main emphasis is on applied research.
3. IDD journal will accommodate articles based on both qualitative and/or quantitative approaches. However, preference will be given to mixed methods and action research.
4. Geographical territory of our journal is the entire globe.
5. Our target audience includes academics and practitioners in outcome or benefit management.
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Message from the Chair/ President

Greetings from Ottawa, Canada! Welcome to another issue of IDD, Vol. 6 No. 1.

This issue is focused on the health ecosystem and sub-systems, the goal of which is to achieve the sustainable development goal number 3 aimed at ensuring healthy lives and promoting well-being for everyone.

We publish this issue at a crucial time (March 2020). On December 31, 2019\(^1\), the World Health Organization (WHO) was alerted to several cases of pneumonia in Wuhan, Hubei province, China. The virus did not match any other known virus. On January 7, 2020, China confirmed coronavirus - COVID-19, the new global health security threat.

In the early 2000s, SARS showed how quickly infection can spread in a highly mobile and interconnected world. The SARS coronavirus (SARS-CoV) virus was identified in 2003. SARS-CoV is thought to be an animal virus from an as-yet-uncertain animal reservoir, perhaps bats, that spread to other animals (civet cats). It first infected humans in the Guangdong province of southern China in 2002. An epidemic of SARS affected 26 countries and resulted in more than 8,000 cases in 2003.

At the time of this publishing, thousands of cases of COVID-19 have been reported in China. As of February 25, 2020\(^2\), 11 cases of COVID-19 are confirmed in Canada. Aside from Canada, other countries or regions have reported cases worldwide.

On February 13, 2020, the Rocky Mountain Laboratories (RML) at the National Institute of Allergy and Infectious Diseases revealed some of the first images of SARS-CoV-2\(^3\), now its official designation (our cover page illustrates images of the virus).

Viruses are microscopic infectious agents consisting of either DNA or RNA wrapped inside a protein coat. They are too small to be seen by a typical light microscope. Coronaviruses\(^4\) are a large family of viruses that cause respiratory illnesses. Some coronaviruses can cause no illnesses, or just mild ones, such as the common cold. Others, such as SARS-CoV and the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) can cause severe illnesses.

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\(^2\) ibid
\(^3\) https://www.livescience.com/new-coronavirus-images.html
Governments around the world, including Canada and the United States and nations in Europe and Asia, responded to the outbreak in Wuhan by sending rescue flights to bring their citizens home.

China itself has reported 78,190 cases to the WHO\(^5\), including 2,718 deaths. At the time of writing, outside China, there were 2,790 cases in 37 countries, and 44 deaths. The death toll and the number of infected people continued to rise.

Dr. Tedros Adhanom Ghebreyesus,\(^6\) WHO director-general, said in his opening remarks at a mission briefing on February 26, 2020: “We are not just fighting to contain a virus and save lives. We are also in a fight to contain the social and economic damage a global pandemic could do”. Asked if he thought the virus had a potential to become a pandemic, he replied: “Absolutely, it has. Are we there yet? From our assessment, not yet.” He added, “We are working with the World Bank and the International Monetary Fund (IMF) to estimate the potential economic impact of the epidemic and develop a strategy and policy options for mitigation. We’re in constant contact with the heads of the two organizations.”

After returning from a fact-finding mission, Dr. Bruce Aylward, the Canadian head of the WHO-China joint mission on COVID-19, praised China’s efforts to fight an outbreak of COVID-19, but warned that the rest of the world isn’t prepared if the virus spreads.

Theresa Tam, Canada’s Chief Public Health Officer, told reporters late in February that it is likely that the virus will cause a pandemic. “It’s not so much a question of if this will happen anymore, but rather more a question of exactly when,” she said. “For now, the risk in Canada is low, but the risk is evolving.”

In the United States, President Donald Trump insisted that the risk to the American people remains very low and said the nation was well prepared. Even so, there was growing criticism of the White House’s handling of the outbreak.

As the coronavirus disease continued to spread around the globe, the American Centers for Disease Control and Prevention (CDC) issued a warning that the United States should prepare for the possibility of the new coronavirus spreading within local communities. The impact could be devastating. Widespread transmission of the coronavirus could hit schools, child care centers, colleges and group events, such as concerts, festivals and sporting events, according to the CDC.

\(^6\) ibid
A global stock market meltdown entered its sixth consecutive day, a decline that reflected rising fears over the fast spreading coronavirus and pulled major benchmarks to near four-month lows. The speed of the market turnaround stunned investors.

Tokyo Olympic organizers and the Japanese government went on the offensive after a senior IOC member said the 2020 Games were being threatened by the spread of the virus, with their fate probably decided in the next three months. "Our basic thoughts are that we will go ahead with the Olympic and Paralympic Games as scheduled," Tokyo organizing committee CEO Toshiro Muto said.

More airlines followed suit as Air Canada suspended flights to China over coronavirus\(^7\). Hotels, airlines, casinos and cruise operators are among the industries suffering the immediate repercussions, especially in countries close to China.

The International Air Transport Association (IATA)\(^8\) warned that it expected the drop in flights due to the coronavirus outbreak to cause the first global decline in airline passengers in 11 years. Overall, the IATA predicted a 4.7 per cent reduction in global traffic, which would cancel out its previous growth estimates for 2020. Such a steep decline would be the first overall loss for the airline industry since the 2008-09 financial crisis.

We can only hope that the WHO and health authorities all over the world are taking all the emergency preparedness measures to address the imminent SARS-CoV-2 pandemic. Elsewhere in this issue, I have written about non-communicable disease epidemic in Sri Lanka, which according to the WHO has reached epidemic proportions worldwide, causing a huge financial drain on countries.

My sincere thanks go to the contributors to this issue for their time and effort; I encourage others to join them. IDD needs writers from all outcome management disciplines to maintain a continuous flow of articles, short or long. IDD is your e-journal. Let the world know what you are doing to shape the outcomes of your organization. Help us make the IDD a world-class professional e-journal!

Enjoy reading your e-journal!

\(^{7}\) https://globalnews.ca/news/6476822/coronavirus-flights-suspended/
Editors’ Note

The editorial team takes pleasure in presenting the latest issue of IDD, dedicated to the theme of health management ecosystem. This issue contains articles that analyze health issues in three nations -- two in South Asia and one in Africa. Please write us with your views and comments.

In Pakistan, women are dying needlessly during childbirth. As authors Muhammad Atiq and Atiq ur Rehman point out, their plight is distressing and sad. Pakistan, the world’s sixth most populous country, with a population exceeding 207.8 million, falls in the middle range of countries when it comes to maternal mortality rates. Pakistan’s rate is improving, but it is still one of the highest in South Asia. This article has three objectives: to describe the current state of the issue of maternal mortality in Pakistan; understand the underlying causes of the issue; and suggest measures for bringing the issue under control.

Sri Lanka has been called the “tear drop of the Indian Ocean” because of its shape and location. Below the surface, however, the island nation of more than 22.5 million nestled in the Indian Ocean faces a major health problem – a profusion of non-communicable diseases, or NCDs. IOCOM chair Sandiran Premakanthan examines experts’ view of the epidemic and its root causes, including suggested mitigation strategies and steps taken by the Sri Lanka government to address the epidemic.

Zambia, a southern African nation with a population of roughly 17.9 million, has a vision -- called Vision 2030. The hope is that, by the end of this decade, Zambia will have become “a prosperous middle income nation”, rather than the “lower middle-income country” as it currently describes itself. Aside from attaining high levels of economic growth and encouraging foreign direct investment, the vision also calls for ensuring a healthy population in which the incidence of major diseases is brought under control. Author John T. Njovu examines progress that Zambia has made in improving the health status of its population and the challenges that it still faces.

Elsewhere in this issue, the editorial team feels it crucial to spark discussions on the on-going issue of coronavirus. Thousands of people have been affected directly and a billion have been affected indirectly. The issue provides warning signs to the world that threats to humans on earth may emerge in different forms and intensity. More collaborative research and discussions on such threats are needed. In this context, everyone can play a role. You can do your part by giving us suggestions on how IDD could serve to meet such challenges.

The theme of the next issue of IDD is education management ecosystem. Education is the pathway to improving human development and alleviating poverty. Hence, this offers you, IOCOM members, an opportunity to contribute to this challenge.
Sub-themes include, though are not restricted to, educational administration; educational environments; educating citizens of the 21st Century; collaborative learning culture; collective intelligence; emotional education (social and emotional well-being); ecology of learning ecosystem: families, schools, community, networks and society and so on.

Send your articles to editorsIDD@iocomsa.org by 30 April 2020 latest.

Enjoy this issue!

Editors

Atiq ur Rehman, Susanne Moehlenbeck, and John Flanders

Disclaimer:
The views, thoughts, and opinions expressed in the articles of this Journal belong solely to the authors of the article.
Non-communicable diseases in Sri Lanka:
“Pearl of the Indian Ocean” battles an epidemic

Sandiran Premakanthan

Introduction

Sri Lanka has been called the “tear drop of Indian Ocean” because of its shape and location. It is also known as “The pearl of the Indian Ocean” because of its natural beauty, and as “The nations of smiling people”. Below the surface, however, the island nation of more than 22.5 million nestled below India in the Indian Ocean faces a major health problem – a profusion of non-communicable diseases, or NCDs. In Sri Lanka, NCDs cause more than three-quarters of all deaths and nearly one in five people die prematurely from NCDs, according to the World Health Organization (WHO).

In October 2015, the United Nations Interagency Taskforce on NCDs conducted a mission to Sri Lanka. It concluded that the epidemic of NCDs has now become a serious economic, as well as public health, issue in Sri Lanka. It is fuelled by tobacco use, unhealthy diet, harmful use of alcohol and physical inactivity. More than one-third of adult males in the country are tobacco users. One out of three people have elevated blood pressure, and a third of women are overweight. Consumption of salt is two to three times higher than recommended. Sri Lanka has set up an operational NCD mechanism within the Ministry of Health to tackle the burden caused by these statistics. It also has an operational action plan to reduce tobacco use, unhealthy diet, harmful use of alcohol and physical inactivity.

This situation hits home for me, the author, as I am a native Sri Lankan. I have first-hand knowledge of many of the issues pointed out of the WHO. This article is an overview of the health care system of Sri Lanka and its challenges in addressing the NCD epidemic. It describes the health care system and its delivery of services, a statistical analysis of the leading non-communicable diseases and major health risk factors contributing to the NCDs.

The article examines experts’ view of the epidemic and its root causes, including suggested mitigation strategies and the steps taken by the government of Sri Lanka to address the epidemic. The article is produced largely from published literature.

Non-communicable disease a worldwide epidemic

The WHO Non-communicable Diseases Progress Monitor⁹, 2017, reported, “premature death from non-communicable diseases continues to be one of the major development challenges in the 21st century”.

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NCDs kill 15 million women and men aged between 30 and 70 each year, and leave no country untouched. Further, this burden is rising disproportionately among low-income and lower middle-income countries, where almost half of premature NCD deaths occur. These deaths disproportionately affect the poorest and those furthest behind economically. The WHO report said the NCD epidemic is driven by poverty, globalization of marketing and trade of health-harming products, rapid urbanization, and population growth.

A non-communicable disease\textsuperscript{10} is a medical condition or disease that is non-infectious. NCDs are diseases of long duration and generally slow progression. They include heart disease, stroke, cancer, diabetes, chronic kidney disease, osteoporosis, Alzheimer's disease, chronic respiratory conditions, cataracts, and many others. All require long-term medical management.

The WHO said NCDs are by far the leading cause of mortality in the world, representing over 60 per cent of all deaths. Of the 57 million global deaths in 2008, 36 million were due to NCDs. The report said NCDs accounted for roughly 63 per cent of total deaths worldwide. By 2030, it is expected that deaths due to chronic NCDs will increase to 52 million per year. At the same time, deaths caused by infectious diseases, maternal and perinatal conditions and nutritional deficiencies are expected to decline by 7 million a year.

Sri Lanka: A profile

Sri Lanka, a former British colony known as Ceylon, won independence on February 4, 1948. Ceylon became the Democratic Socialist Republic of Sri Lanka within the Commonwealth of nations in 1972. It is a diverse multicultural country, situated a few degrees north of the equator, with a land area of 65,525 square kilometers, a length of 432 km and a width of 224 km (See map below). Sri Lanka is home to many religions, ethnic groups and languages. It has an elected president and a Westminster style of parliamentary democracy. According to a World Bank report\textsuperscript{11}, Sri Lanka is a development success story in many ways. It has shown steady growth over the last decade, although key macroeconomic challenges persist.

Sri Lanka recently graduated to an upper middle-income country with a per capita gross domestic product of US$4,102 in 2018. Following 30 years of civil war that ended in 2009, Sri Lanka’s economy grew at an average 5.6 per cent between 2010 and 2018, reflecting a peace dividend and a determined policy thrust towards reconstruction and growth. However, growth has slowed during the last few years. Currently, 30 per cent of its workforce is in primary agriculture. Sri Lanka passed most of its Millennium Development Goals and

\textsuperscript{10} http://wellnesssrilanka.com/ncd.html
\textsuperscript{11} https://www.worldbank.org/en/country/srilanka/overview
economic growth has benefited the poorest in society. Unemployment is low, at 4.4 per cent. In 2013, total health spending as a proportion of GDP was 3.24 per cent; expenditure on public sector primary care hospitals represented 6.4 per cent of current health expenditure, according to National Health Accounts. Sri Lanka’s economy is transitioning from a predominantly rural-based economy towards a more urbanized economy oriented around manufacturing and services. Social indicators rank among the highest in South Asia and compare favorably with those in middle-income countries. Economic growth has translated into shared prosperity with the national poverty head count ratio declining from 15.3 per cent in 2006-07 to 4.1 per cent in 2016. Public debt levels are high, while the overall debt portfolio indicates some important challenges.

Figure 1. Map of Sri Lanka

Sri Lanka is famous for its tea, marketed worldwide as Ceylon tea, a major export commodity. The country is also well known for precious and semi-precious stones. Sri Lanka is one of the major tourist destinations for Asians, Europeans and Middle Eastern
Tourism is a major source of foreign exchange. The tourism and hospitality industry is one of the fastest growing economic sectors despite recent setbacks.

**Sri Lanka’s health profile dominated by NCDs**

Sri Lanka’s health profile\(^{12}\) is dominated by non-communicable diseases. NCDs account for 75 per cent of all deaths. Major causes of hospital deaths are ischemic heart disease, neoplasms, zoonotic and other bacterial diseases, pulmonary heart disease and diseases of the pulmonary circulation and cerebrovascular diseases. Tobacco use, obesity and high blood pressure are major factors in NCDs.

The country is already at the advanced stage of ageing (In 2015, the median age\(^{13}\) of the population of Sri Lanka was 32.3 years when compared to India’s median age of 26.8 years old in 2015) and disease transitions. NCDs have been a burden in Sri Lanka for years.

During the past half century, the proportion of deaths due to circulatory diseases (such as heart diseases, strokes) increased from 3 per cent to 24 per cent, while the proportion due to infectious diseases declined from 24 per cent to 12 per cent. Diabetics and cancer deaths are also on the rise. The World Bank reported NCDs such as heart disease, diabetes, cancers and asthma, as well as their risk factors, such as obesity, smoking, high sugar and salt diets, and alcoholism are major health issues affecting the population. According to the report, NCDs have already become the largest contributor to the disease burden in Sri Lanka, accounting for 83 per cent of common maladies, disabilities, and early death.

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\(^{12}\) [https://www.who.int/beat-ncds/countries/sri-lanka/en/](https://www.who.int/beat-ncds/countries/sri-lanka/en/)

Table 1. Key demographic, macroeconomic and health data for Sri Lanka

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Results</th>
<th>Source of information</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution of population (rural/urban)</td>
<td>Rural 77.4%, urban 18.2%, estate 4.4%</td>
<td>Census of Population and Housing 2012</td>
<td>Noteworthy are the successes in universal immunization coverage, reduction of maternal mortality and infant mortality, control of diarrheal diseases, elimination of malaria, filariasis and neonatal tetanus, and low prevalence of HIV</td>
</tr>
<tr>
<td>Life expectancy at birth (years)</td>
<td>Female 78.6, male 72</td>
<td>Annual Health Bulletin 2014, Ministry of Health, Nutrition and Indigenous Medicine, Sri Lanka</td>
<td></td>
</tr>
<tr>
<td>Under 5 mortality rate</td>
<td>10.0/1000 live births (2013)</td>
<td>HPI</td>
<td></td>
</tr>
<tr>
<td>Maternal mortality rate</td>
<td>32/100 000 live births</td>
<td>HPI</td>
<td></td>
</tr>
<tr>
<td>Immunization coverage under 1 year (excl. pneumococcal and rotavirus)</td>
<td>92–97% (pneumococcal and rotavirus N/A)</td>
<td>HPI</td>
<td></td>
</tr>
<tr>
<td>Income or wealth inequality (Gini coefficient)</td>
<td>0.48 (2012)</td>
<td>Census of Population and Housing</td>
<td></td>
</tr>
<tr>
<td>Total health expenditure as proportion of GDP</td>
<td>3.24%</td>
<td>Sri Lanka National Health Accounts (NHA) 2013</td>
<td></td>
</tr>
<tr>
<td>HC expenditure as % of current government health expenditure</td>
<td>2%</td>
<td>Primary Health Care Performance Initiative: <a href="http://www.phcperformanceinitiative">http://www.phcperformanceinitiative</a>. org/south-asia/sri-lanka</td>
<td></td>
</tr>
<tr>
<td>Per capita public sector expenditure on primary health care</td>
<td>7,497 Sri Lankan rupees</td>
<td>NHA 2013</td>
<td></td>
</tr>
<tr>
<td>Out-of-pocket payments as proportion of total expenditure on health</td>
<td>40%</td>
<td>NHA 2013</td>
<td></td>
</tr>
</tbody>
</table>

The country has a tropical climate and is susceptible to frequent rains, floods and landslides, all of which increase the burden of respiratory illnesses, vector-borne diseases and injuries.

**Causes and risk factors**

Historically, many NCDs were associated with economic development and so-called "diseases of the rich", while infectious diseases seemed to affect low-income countries.
However, today an estimated 80 per cent of the four main types of NCDs -- cardiovascular diseases, cancers, chronic respiratory diseases and diabetes -- occur in low- and middle-income countries. The prevention and control of NCDs is becoming increasingly important on the global health agenda.

Risk factors such as an individual's background, lifestyle and environment are known to increase the likelihood of certain NCDs. They include age, sex, exposure to air pollution, and behaviours such as smoking, unhealthy diet and physical inactivity. These could aggravate diabetes and obesity, in turn leading to increased risk of many NCDs. Most NCDs are considered preventable because they are caused by modifiable risk factors.

**Figure 2. Risk factors**

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**Risk of premature deaths due to NCDS (percentage) in Sri Lanka**

![Risk of premature deaths due to NCDS (percentage) in Sri Lanka](image)

2016 Total Population: 20,798,000
2016 Total Deaths: 143,000
Table 2 - Proportional Mortality in Sri Lanka

<table>
<thead>
<tr>
<th>Cause</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular diseases</td>
<td>34%</td>
</tr>
<tr>
<td>Cancers</td>
<td>14%</td>
</tr>
<tr>
<td>Chronic respiratory diseases</td>
<td>8%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>9%</td>
</tr>
<tr>
<td>Injuries</td>
<td>10%</td>
</tr>
<tr>
<td>Communicable, maternal, perinatal and nutritional conditions</td>
<td>8%</td>
</tr>
<tr>
<td>Other NCDs</td>
<td>18%</td>
</tr>
</tbody>
</table>

Health care system governance and delivery of services

Health governance in Sri Lanka is, as mandated by the Constitution, led by the central Ministry of Health, Nutrition and Indigenous Medicine, together with nine provincial health councils (PHCs)\(^\text{14}\). The Ministry is the leading agency, responsible for formulating health policy and overseeing implementation of health services.

Management of the main hospitals is the responsibility of the Central Ministry, while provincial health authorities manage the majority of hospitals at the secondary care level and PHC institutions.

The ministry is responsible for recruiting health staff, while provincial ministries have authority to recruit only minor staff categories with the permission of the ministry. The Ministry is also responsible for transfers of health staff, grade promotions, retirement and disciplinary actions.

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As observed from the visual map, Sri Lanka’s health care delivery is through the allopathic and ayurvedic\textsuperscript{15} (Ayurveda, the traditional Hindu system of medicine) streams of medicine. The allopathic system envisages a reform in reorganization of health services with effective linkages between primary and specialized care.

National vertical programmes:

\textsuperscript{15} https://www.merriam-webster.com/dictionary/Ayurveda
Human resources for primary health care

The PHC workforce in Sri Lanka is employed for performing activities in both the preventive and curative sectors. While the public sector workforce is distributed throughout prevention and curative primary care services, the private sector operates mainly in the curative primary care service sector.

According to the Annual Health Bulletin 2014, for every 100,000 population, Sri Lanka had 84.8 medical officers, 185.1 nurses, 7.3 public health inspectors and 28.7 public health midwives. Medical officers working in the public sector are free to work in the private sector on a part-time basis; anecdotal evidence indicates that around 40 per cent of medical officers undertake part-time general practice.

The private health sector is regulated by the provisions of the Private Health Services Regulatory Council established by the Ministry of Health, Nutrition and Indigenous Medicine under Act No. 21 of 2006. The Act provides the framework to develop and monitor standards to be followed by the registered private medical institutions.

About 500 full-time general practitioners are registered with the Private Health Services Regulatory Council, in accordance with the Act16.

During my recent visits to Sri Lanka, I attended a private hospital outpatient clinic for routine medical care. There is a charge to see a doctor and for diagnostic services, such as blood work, so the wait time was minimal.

From my point of view, the public- private duel system in Sri Lanka is working well, especially for higher income residents; the middle- and lower-middle income population is taken care of by the government health care system.

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16 Private medical institutions (registration). Private Health Services Regulatory Council website (http://www.phsrc.lk/).
Challenges and strategies to mitigate NCDs

A study published in September 2019 by the journal Economics and Human Biology investigated the effects of experiencing NCDs on labour force outcomes of working-age individuals and their households in Sri Lanka, based on self-reported health survey data from the labour force. It warned that NCDs can escalate Sri Lanka’s unemployment burden, as well as household spending on health and poverty.

“These NCDs reduce individual labour supply by more than 80% and labour earnings by more than 90%,” wrote Ajantha Sisira Kumara, study author and senior lecturer in public administration at the University of Sri Jayewardenepura, Colombo, Sri Lanka. “The employment probability of individuals with paralysis and mental illnesses is also relatively lower by more than 60%.”
He added: “On average, employment likelihood, labour supply, and labour earnings of NCD patients are significantly lower than those of non-NCD individuals.” Kumara wrote that his findings showed that those with at least one non-communicable disease account for around 19 per cent of the working-age population. “On average, employment likelihood, labour supply, and labour earnings of NCD patients are significantly lower than those of non-NCD individuals.”

Among issues linked to NCDs, he cited limited government health allocations (around four per cent of GDP), inadequate social security, and increasing household out-of-pocket expenses for health care. “Households with NCD prevalence compromise on the basic needs of food, housing and clothing and such burden on poorer households is higher than richer ones because richer households have the option of sacrificing more from non-basic needs to cope with NCDs,” Kumara wrote.

As part of the UN’s 2030 Agenda for Sustainable Development, countries are committed to have national responses to lower premature mortality from NCDs by one-third through prevention and treatment, he wrote.

Chandrika Wijeyaratne, former Sri Lanka Medical Association president, said that because NCDs are not inevitable, timely actions can trigger myriad future benefits, including healthy ageing, lower likelihood of disabilities, and longer and more productive lives. Wijeyaratne added that a number of factors can effectively help address the NCD burden. They include: measures such as heightened investment in NCD prevention and control, establishing national NCD surveillance, sustained access to screening and medication, especially for the poor, tackling under nutrition and over nutrition and developing public-private partnerships for prevention and control.

Thalatha Liyanage, former director of the NCD unit of Sri Lanka’s ministry of health, said a national action plan is already being implemented. “Under the plan, strategies involving public awareness measures to reduce major risk factors such as smoking, alcohol use, obesity, unhealthy diets and sedentary lifestyles are being implemented through the existing health networks.”
Dr. Shaminder Weerakoon, Hospital Head for the District Base Hospital Theldeniya in the Central Province of Sri Lanka said: “With support from the World Bank\textsuperscript{17} and other partners, we have been able to improve the quality of health services through providing emergency services that treat 10 to 12 patients per day for traffic accidents and poisonings.”

An electronic registration and records system has also reduced wait times for patients from two hours to one hour for most care. Before, patients had to go to Kandy (Sri Lanka’s scenic hill capital city) for emergency care, but they can come to district level hospital, which now has the facilities and staff training to help them.


Pharmacists preparing medication for patients. Over 80\% of Sri Lanka's primary care facilities now have an ample supply of 16 essential drugs to treat NCDs.
There is a central procurement system for medicinal drugs, which are procured based on the requirements of individual institutions, including primary care facilities. As reported by the Annual Health Bulletin 2014, a Medical Supplies Management Information System has been established and was fully functional by 2014.

**WHO’s recommendations for Sri Lanka’s health care systems**

The WHO case study on Sri Lanka’s health care system and delivery made the following recommendations:

- Strengthen primary health care by consolidating efforts and allocating financial and human resources to initiate required changes;

- Implement “shared clusters”, that is, clustering of a group of primary-level curative institutions around an apex hospital and demarcating a catchment population for the cluster;

- Designate a primary care doctor for everyone. This would mean that all doctors in curative primary care would be responsible for a defined population;

- Transform medical education to produce a fit-for-purpose primary care doctor;

- Establish a personal health record for all adults, introduced through primary care and used in establishing a referral mechanism and to ensure continuity of care;

- Ensure access to essential medicines and investigations and resource sharing among hospitals within the cluster;

- Ensure accountability, assessing cluster performance using key performance indicators at institutional and regional levels and reviewed at the national level; and

- Implement a national social marketing strategy and empower people with healthy lifestyle targets.

**Conclusion**

As the Kumara study points out, the current health system in Sri Lanka was put in place during a time when health priorities were in the areas of maternal and child health and communicable diseases.

“Today, changes are required to better respond to the changing disease burden which includes chronic non-communicable diseases, elderly care, accidents and injuries and rising mental health problems,” it says.
The fact that the epidemic of NCDs has now become a serious economic as well as public health issue in Sri Lanka makes it imperative that its health system implement more comprehensive and continuing care. It is commendable that health services are being reoriented towards these needs.

The way forward, to continue with the universal health access is to adopt the “shared care cluster system”. In this delivery model, a family doctor is responsible for a smaller population in the curative system, similar to the successful system for community health services.

I think the “shared care cluster system” seems to be the optimal cost-effective delivery model, the way forward if Sri Lanka is to wipe its epidemic of NCDs.
Measures to control the maternal mortality rate in Pakistan

Muhammad Atiq and Atiq ur Rehman

Introduction

Thousands of women are dying needlessly during childbirth in Pakistan. Their plight is distressing and sad. In many cases, the victims live in remote rural areas where it is difficult to find proper medical care, let alone a hospital. So most births occur at home without clean equipment and trained midwives. Mortality is high in the poorest households. Many women are subject to physical and mental violence during pregnancy.

Often women who live in rural areas give birth continuously with little recovery time between pregnancies. As a result, their body is unable to bear the labour. In addition, women are often at the mercy of men in the family who make the decision whether a woman needs professional maternal health care.

Pakistan, the world’s sixth most populous country, with a population exceeding 207.8 million, falls in the middle range of countries when it comes to maternal mortality rates. Pakistan’s rate is improving, but it is still one of the highest in South Asia.

This article has three objectives: 1) to briefly describe the current state of the issue of maternal mortality in Pakistan; 2) understand the underlying causes of the issue; and 3) suggest measures for bringing the issue under control.

Maternal mortality: A type of human crisis

The World Health Organization defines maternal mortality as “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from unintentional or incidental causes” (WHO, 2019). It is measured as “the number of maternal deaths during a given time period per 100,000 live births during the same time period” (WHO, 2019).

Maternal mortality is an area of great concern for almost every country, especially in the developing world. It is a type of human crisis, as it matters to human lives and reflects a woman’s status in society and inequalities in access to quality health care (Rizvi et al, 2015).

The tragedy is that most maternal deaths are preventable. In view of the sensitivity and importance of the issue, a specific target for maternal mortality has been kept in the Sustainable Development
Goals (SDGs). “SDG target 3.1” says: reduce the global maternal mortality rate to fewer than 70 deaths per 100,000 live births by 2030.

In 2015, Pakistan’s maternal mortality rate, which we will refer to hereafter as MMR, was 178 maternal deaths for every 100,000 live births. This was well below the average for the entire world of 216 (Figure 1).

In 1994, Pakistan’s MMR hit 375, putting it among the countries with the highest rate. Over the two decade period, though, Pakistan made considerable progress, as the MMR declined at an average annual rate of 2.5 per cent, using 1994 as a base year. However, the nation fell short of meeting its goal of 140 by 2015 (Government of Pakistan, 2013) set under the Millennium Development Goals, or MDGs (Rizvi, et al, 2015). In contrast, Pakistan’s MMR in 2015 was far higher than rates in either Iran or China, but nearly on par with those in other South Asian nations, such as India and Bangladesh. The Government of Pakistan also recognizes that the nation’s rate is still on higher side (Government of Pakistan, 2019b).

**Figure 1. Maternal mortality rate in 2015 vs 1994**

![Maternal mortality rate in 2015 vs 1994](image)

It is also worth mentioning that many regional countries made better progress than Pakistan. Bangladesh reduced its MMR from 495 in 1994 to 176 in 2015. Similarly, Nepal’s MMR fell from
693 to 258 in the same period. Both countries achieved their Millennium Development Goals ahead of time.

**Pakistan’s challenge: Overcoming huge regional disparities**

The target set under SDGs for 2030 is 70. That means Pakistan will have to reduce its MMR at an average rate of 4.05 per cent a year (taking 2015 as benchmark) to achieve its target. It is not an ordinary challenge; Pakistan reduced its MMR at a rate of just 2.5 per cent during 1994-2015 (taking 1994 as a base year).

An even bigger issue is high regional disparities in the country. For example, a study by Anwar, Torvaldsen, Sheikh & Taylor (2018) found an MMR of 246 in a rural district of Pakistan, while a study by Mubeen et al. (2019) found 142.5 in Sindh. Rafiq, Syed & Ghaffar (2019) reported 431 for Peshawar.

**Causes of maternal mortality**

There are multiple causes of maternal deaths occurring in Pakistan. They can be grouped into two categories: direct causes and indirect causes, as briefly described below:

**Direct causes**

Several direct causes, which account for almost 78 per cent of deaths, have been reported by different studies. The leading reported causes are abortion, hemorrhage and anemia.

- **Abortion**: In Pakistan, abortion is legal in limited situations. It forces many women with an unwanted pregnancy to seek an unsafe abortion, which leads to the deaths of many mothers. Karim & Ahmed (2017) have reported that about 10-12 per cent of maternal mortalities are attributed to complications caused by abortions (Karim & Ahmed, 2017). One major reason for abortions is the desire of families to have only male babies.

- **Postpartum hemorrhage (PPH)**: PPH is still a big contributor to maternal mortality (Humayun, 2017; Mazhar, Batool & Batool, 2018; Parks, 2019; Rafiq, Syed & Ghaffar, 2019). However, the extent to which it causes maternal mortality is not known.
• **Anemia**: Anemia is also one of the major direct causes of maternal mortality in Pakistan (Humayun, 2017; Parks et al., 2019). Again, the extent to which it causes maternal mortality is not known.

**Indirect causes**

There are two major indirect causes of maternal mortality: lack of available maternal health care and an inadequate demand for maternal health care. In other words, women do not seek out health care because of certain socio-economic factors. Hence, it is crucial to understand such factors. Thaddeus and Maine (1994) have proposed what is known as a “Three Delay Model”, which provides a framework to analyze the socio-economic causes of maternal mortality. It states that there are three types of delays that ultimately lead to maternal deaths:

- Delay 1: delay in the decision to seek care; related to socio-cultural factors
- Delay 2: delay in reaching care; accessibility of the facility
- Delay 3: delay in receiving adequate care at the health facility; quality of care

The first and second delays are most common (Iqbal, et al., 2017). According to a study conducted in Services Hospital Lahore by Rasul, Rashid & Yousaf (2016), 25 per cent of maternal mortalities occurred within six to 12 hours of admission; 37.5 per cent occurred within 12 to 24 hours of admission. These findings indicate that families take too long deciding to take women to hospital for maternal health care. This is because demand for maternal health care is weak.

Let us analyze the socio-economic factors that suppress the demand for maternal health care and understand how such factors cause delays 1, 2 and 3:

- **Lack of knowledge regarding maternal care** causes delay 1. Awareness about maternal health care is extremely low among masses in Pakistan (Sarfraz, et al., 2016). This is linked to a low literacy rate. That is why researchers such as Mazhar, Batool & Batool (2018) have highlighted illiteracy as a major factor responsible for high the MMR in the country. However, it is pertinent to note that raising female literacy is not enough, as the decision to seek maternal health care lies mostly with men. Hence, the level of education among men is also vital in reducing MMRs (Ghani, et al., 2019).

- **Lack of female empowerment** causes all three delays. Socioeconomic factors play a decisive role in the prevalence of a high MMR (Asghar & Rana, 2019; Sarfraz, et al., 2016). Studies (e.g. Ahmed, Alam & Raynes-Greenow, 2018; and Ghani et al., 2019) show that the risks of maternal mortality are high where female empowerment is on lower side. In Pakistan, especially in rural areas, women have limited power in making decisions about maternal
health (Ali, et al., 2016). Hence, inter-familial relationships matter a lot in deciding whether to seek maternal health care. Ghani, et al. (2019) note that inter-familial relationships, especially the role of mothers-in-law, are important factors. The reality is that such relationships are not good in many families. In many cases, women are subject to physical and mental violence during pregnancy. Evidence of this has been provided by Ali, et al. (2016).

- **Untrained community birth attendants** cause delays 1 and 2. Just over 30 per cent of the deliveries in Pakistan, according to World Bank statistics, are handled by untrained traditional birth attendants or midwives; in rural settings, this ratio is higher. The lack of needed skills and knowledge leads to complications resulting in maternal deaths (Sarfraz, et al., 2016).

- **Poverty** also causes all three delays. Financial constraint is one of the major factors suppressing the demand for maternal health care (Sarfraz, et al., 2016; Ghani, et al, 2019). The poor are the major sufferers. Maternal mortality is high in the poorest households (Government of Pakistan, 2018). Ahmed, Alam & Raynes-Greenow (2018) note that “Mothers whose family elders decided their healthcare were twice more likely to have had a stillbirth and mothers facing ‘big’ problems in financial access to receiving pregnancy care were 1.67 times more likely to have experienced an early neonatal mortality”. There are issues on the supply side, too. Mumtaz et al. (2011) also opine that health services providers cannot ensure that poor and socially excluded women, especially those who are from financially indebted families, would be able to access health care.

- **High fertility** causes delay 1, especially among poor families. The irony is that fertility is high in poor families, which further suppresses the demand for maternal health care, as they cannot afford it. Hence, it is likely that many mothers die because proper health care is not available. High fertility is attributed to weak adoption of family planning measures (Government of Pakistan, 2018). Although the fertility rate in Pakistan has dropped in the last couple of decades, it is still high: 3.377 births per woman (WPR, 2019).

- **Lack of transport facilities** causes delays 1 and 2. Long distances and the high cost of transportation make it difficult for poor households to access maternal health care (Sarfraz, et al., 2015).

- **Deficiencies in the designs of maternal health care programs**: An analysis of most projects related to maternal health care implemented in Pakistan, especially in the public sector, reveal that such projects focused mainly on improving the facilities. In other words, they attempted to address delay 3 only. The only exceptions are some humanitarian programs, where an integrated approach was adopted covering all three delays. However, their scale and coverage are too small to make a big impact on the MMR of the country, given that such
programs are small in scale and have limited influence to intervene to address the third delay. The fact is that Pakistan’s public sector is mostly working on the supply side and ignoring the demand side of maternal health care. As discussed above, it is evident that poor women with low literacy rates and those in socially marginalized/excluded families will not be able to obtain quality maternal health services, even if the services at health facilities are improved.

Conclusions and recommendations

The issue of Pakistan’s high MMR is rooted deeply in a web of multiple socio-economic factors. Most of these factors converge into cultural barriers and financial constraints. However, the designs of most of maternity health care programs often disregard the importance of such factors. As a result, we recommend the following:

- **Mapping of maternal mortality**: Evidence-based decision making needs to be adopted. This requires that the policy-making institutions should have accurate, updated and comprehensive data about the issue. Since health is a provincial subject and maternal mortality rates vary across the country, it is suggested that provincial governments map out the prevalence of MMRs by district so as to enable designing of targeted programs.

- **Access to health care**: The provincial governments should identify and take measures to make health services accessible to women who belong to the poorest and indebted families and who are thus unable to access health services because of economic reasons (Mumtaz et al., 2011). In districts such as Awaran, Chaghi, Kharan and Washuk, where the population is highly scattered, mobile service-providing units can be implemented.

- **Demand of health services**: To increase the demand for maternal health care, short-term and long-term strategies will have to be put in place while targeting all types of delays. Some of the strategies are suggested below:
  - A voucher scheme is a tested approach. Research evidence (such as Agha, 2011) shows that a targeted voucher scheme would help increase institutional delivery. Since cultural barriers matter a lot in the case of delays 1 and 2, it is suggested that all future maternal health care programs should have an essential component of female empowerment.
  - Governments should make available better health facilities at the door step of communities (Mazhar, Batool & Batool, 2018)
A comprehensive policy change and integrated approach are needed to promote institutional deliveries and safe maternal health services (Jafarey, S. 2003)

- **Population control:** Since population growth in Pakistan is very high, family planning interventions can also be considered as a measure for controlling its MMR. This would bear financial dividends. According to an estimate of UNFPA (2019b), one dollar invested on family planning can help save four dollars in net direct health costs.

- **Other suggested measures:**
  - Improved literacy rates (Mazhar, Batool & Batool, 2018)
  - Good nutrition (Mazhar, Batool & Batool, 2018)
  - Measures to prevent severe anaemia during pregnancy (Park, et al, 2019). One such measure is iron supplementation during antenatal visits (Mazhar, Batool & Batool, 2018).
  - Improved antenatal care (Humayun, 2017)
  - Strengthened emergency obstetric services (Humayun, 2017)
  - Pre-service and in-service education and training of community mid-wives (Mubeen et al., 2019).

Lastly, it is urgent that all provincial governments design and enact multi-pronged strategies to mitigate the impact of MMRs so as to achieve the targets set under the SDGs.

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**Zambia: Vision for a healthier, wealthier future**

*John T. Njovu*

**Introduction**

Zambia, a southern African nation with a population of roughly 17.9 million, where six out of every 10 people live below the poverty line and where 1.2 million live with HIV, has a vision.

It is a vision, said former Zambian president Levy Patrick Mwanawasa, that will require a change in the attitudes and collective mindsets of all Zambians, particularly towards work and participation in national affairs. It is called Vision 2030. The hope is that, by the end of this decade, Zambia will have become “a prosperous middle income nation”, rather than the “lower middle-income country” as it currently describes itself.

It is a tall order. Aside from attaining high levels of economic growth and encouraging foreign direct investment, the vision also calls for ensuring a healthy population in which the incidence of major diseases is brought under control. Despite progress in reducing maternal and child mortality rates, Zambia remains a country that has a high disease burden and whose government is under significant pressure to improve the health status of its people, says the nation’s minister of health, Dr. Chitalu Chilufya.

Zambia faces a two-pronged disease burden. It has a high prevalence of communicable diseases including HIV/AIDS, tuberculosis, malaria, diarrhea and intestinal worms. In addition, rates of incidence are rising for non-communicable diseases, such as diabetes mellitus, cancer and chronic respiratory disease.

Dr. Chilufya is responsible for implementing Zambia’s National Health Strategic Plan for 2017-2021, which envisions a prosperous country in which all Zambians have access to quality health services.

The National Health Strategic Plan supports Vision 2030. “While the health plan recognizes that all health care interventions are important and should continue to receive support, it also recognizes that interventions must be prioritized due to the constraints on available resources and capabilities,” Dr. Chilufya said. “The plan therefore focuses on Primary Health Care as the main vehicle of service delivery; resolving the human resource crisis; addressing public health problems and ensuring that priority systems and services receive the necessary support.”
This article examines progress that Zambia has made in improving the health status of its population and the challenges that it still faces.

**Zambia: A profile**

Zambia is landlocked in the center of southern Africa, with a total area of 752,612 square kilometers, roughly the same size as Turkey. It shares several of its key geographical and economic features with neighbouring Zimbabwe, such as Victoria Falls, Lake Kariba (and its hydroelectric capacity), and a stretch of the Zambezi River.

Zambia ranks among the countries with highest level of inequality globally, according to the World Bank. As of 2015, 58 per cent of Zambians earned less than the international poverty line of US$1.90 per day, compared with 41 per cent across Sub-Saharan Africa. Three-quarters of the poor lived in rural areas.

Map of Zambia depicting Population Distribution by District, Zambia, (Source: 7NDP)
The plans, programmes, policies and interventions of Zambia’s public health institutions are guided by local, regional and international instruments. On the international level, Zambia seeks to adhere to the requirements of the SDGs. On the local level, it focuses on implementing the requirements of the national Constitution, Vision 2030, the 7th National Development Plan - 2017 – 2021(7NDP), the National Health Policy and the Minister’s Legacy Goals.

Zambia’s Vision 2030 envisage Zambia as ending poverty and becoming a medium ranking wealthy country. This means even public medical services have to be enhanced. The national long term vision though formulated earlier than the UN’s Sustainable Development Goals (SDGs), matches the aspirations of the SDGs. It started being implemented in 2006.

Goal number 3 of SDGs is directly related to health. However, there are also about 51 out of 169 targets spread across 17 goals that have a direct influence on health and wellbeing (Ministry of Health, 2019:3).

Zambia’s economy is primarily driven by five sectors: mining, agriculture, construction, transport and communications. Government figures show gross domestic product was estimated to have increased 7.2 per cent in 2005 and 10.3 per cent in 2010, before declining to 5 per cent in 2013 and 2014 and declining further to 2.9 per cent in 2015. In 2018, GDP increased 3.7 per cent. The current unemployment rate is estimated at 7.8 per cent.

Zambia is considered a stable country in Africa with successful democratic elections held every five years. The next elections will be held in 2021. Vision 2030 highlights three scenarios of development options: baseline, preferred and optimistic.

The socio-economic development objectives enshrined in the preferred scenario were to attain and sustain annual real growth of 6 per cent (2006-2010), 8 per cent (2011-2015), 9 per cent (2016-2020), and 10 per cent between 2021 and 2030. Other objectives:

- to attain and maintain a moderate inflation rate of 5 per cent;
- to reduce the national poverty head count to less than 20 per cent of the population;
- to reduce income inequalities;
- to provide secure access to safe potable water sources and improved sanitation facilities to 100 per cent of the population in both urban and rural areas;
- to attain education for all; and,
- to provide equitable access to quality health care to all by 2030.
Figure 1. Vision 2030 and Medium Term Plans

Vision 2030 and Medium Term Plans

Required financial resources: Quality health service won’t come cheap

Quality health service won’t come cheap, as the strategic plan points out. The total cost of the plan for all five years is estimated at US$14.3 billion. This consists of US$3.2 billion (22.6 per cent of the total) for human resources, US$2.4 billion (17.1 per cent) for infrastructure, US$2.2 (15.8 per cent) for pharmaceuticals and supply chain management, US$1.0 billion (7 per cent) for control of HIV/AIDS and US$0.9 billion (6.5 per cent) for bringing malaria under control.

As Zambia is financially constrained, it needs the international donor community to help meet this budget. The plan identifies a handful of major risks to successful implementation. These include: the health sector’s dependence on donor financing; the Government not increasing the percentage of the general budget spent on health; and cooperating partners failing to commit funds in line with global declarations.

It says, however, that continuous efforts will be made throughout the lifetime of the NHSP to ensure these potential challenges are overcome.
Zambia’s health care delivery system

The Zambian public health system is managed by the Ministry of Health. The strategic programmes for service delivery and support systems are outlined in the National Health Strategic Plans. They provide the overall framework to guide collaboration in the implementation of health programs (Ministry of Health, 2017:11).

Zambia is divided into 10 administrative provinces and 105 districts. Health management is performed through 10 provincial health offices, 105 district health offices, and statutory bodies. The country has eight third-level hospitals, 34 second-level hospitals, 99 first-level hospitals, 1,839 health centres, and 953 health posts. All third-level hospitals are Government-owned. Of the second level hospitals, 26 are Government-owned, and eight are owned by the Churches Health Associations of Zambia.

Health services in Zambia are provided by four main players: the Government, faith based (not-for-profit) providers, the mines, and private (for-profit) providers. The vast majority (90 per cent) of patients seek care in facilities owned and run by the Government (Masiye et al., 2010). The national level is responsible for overall coordination and management, policy formulation, strategic planning and resource mobilisation.

Provincial health offices act as the link between the national and district level and are charged with backstopping provincial and district health services. The provincial office is also tasked with providing second-level referral services (through general hospitals). The district is responsible for implementing health promotion, preventive, curative, and rehabilitative services. The district health office is responsible for coordinating service delivery at that level. Each district has a district hospital, which provides first-level referral services. Below the district, there are health centres providing both static and outreach activities.

As of December 2016, the Ministry had an approved establishment of 63,057 positions, but only 42,515 were filled. It recruited a total of 2,071 health workers against the targeted 2,500 health workers (Ministry of Health, 2017:1). The government plans to recruit 30,000 health workers by 2021. A total of 21,159 nurses and doctors have been recruited in the last eight years (Mwanza, 2019:13).

The Zambian government wishes to provide universal health care to all its citizens. It has an integrated approach to the fight against diseases, involving partnering with communities and their leaders as well as non-governmental organizations and private businesses.
High disease burden

Zambia still experiences a high disease burden despite making tremendous progress in some selected indicators. However, the country has now embarked on transformational reforms to enhance the performance of the public health sector and reduce the disease burden. There are three main infectious diseases of public health interest in Zambia: malaria, HIV/AIDS, and tuberculosis. The remainder of this article examines progress in various health sectors.

HIV/AIDS prevalence on the decline

The prevalence of Human Immunodeficiency Virus (HIV) in Zambia has been on the decline recently. The Zambia Population HIV Impact Assessment survey, known as ZAMPHIA, shows a reduction of about 1.7 percentage points from 13.3 per cent in 2014 to 11.6 per cent in 2016.

The mode of HIV transmission remains predominantly heterosexual and mother-to-child.

Zambia’s first AIDS case was reported in 1984. In 2002, the national HIV seroprevalence among adults aged 15 to 49, the prime working-age population, was about 16 per cent; just over half (54 per cent) of them were women. The HIV prevalence among females aged 14 to 19 was six times that of males in the same age group.
By end of 2004, one million adults and children were living with HIV/AIDS. An estimated 600,000 children were orphaned. AIDS cases peaked among women aged 20 to 29 and men aged 30 to 39. The major vulnerable groups were women (mostly those aged 20 to 29); children, especially orphans; military personnel; sex workers; truckers; fisheries workers; and fishmongers (WHO, 2005).

Between 2010 and 2017, annual HIV infections (for all ages) declined from 63,000 to 48,000. New infections among children up to the age of 14 declined from 14,000 in 2005 to 7,300 in 2017. Annual AIDS-related deaths fell from 25,000 in 2010 to 16,000 in 2017. According to the 2015 Zambia Spectrum projections, the estimated number of children living with HIV has dropped from 92,000 in 2000 to 89,000 in 2015.

However, despite these reductions, the national HIV burden is still high. Western and Lusaka provinces have the greatest HIV burden with a prevalence of 15.9 per cent and 15.7 per cent, respectively. The least burdened is Muchinga province at 5.7 per cent. Among the 40,000 female adolescents and 25,000 male adolescents estimated to be living with HIV, only 60 per cent are on HIV treatment (ARVs) (UNICEF, 2018).

The Government of Zambia has introduced anti-HIV programmes, policies and guidelines. Testing, counselling and comprehensive treatment is provided to people living with HIV/ AIDS. There is also a National AIDS Strategic Framework 2017-2021 and an Adolescent Health Strategy 2017-2021.

**Malaria**

Malaria is a disease caused by a parasite is transmitted to humans through the bites of infected mosquitoes. People who have malaria usually feel very sick, with a high fever and shaking chills.

Malaria is among the top causes of mortality and morbidity in Zambia. Eliminating it is a national priority that requires an evidence-based focused, comprehensive, and sustained strategic approach. The entire population of Zambia is at risk of malaria, although the prevalence varies widely across and within districts.

Children under the age of five, pregnant women, the chronically ill, and immuno-compromised persons, such as those living with HIV and AIDS, are considered among the highest risk groups for malaria infection in Zambia (World Malaria Report 2016, WHO).

Malaria transmission is prevented through two main primary control methods: the use of long-lasting insecticide-treated nets; and indoor residual spraying complemented by larval source management.

Much progress has been made to increase the coverage of primary malaria interventions in Zambia in the past decade. Ownership of at least one insecticide-treated net per household has increased from 68 per cent in 2012 to 77 per cent in 2015.
Likewise, in the same period, households with insecticide-treated bed nets or that had their dwellings sprayed increased from 73 per cent to 81 per cent. The proportion of women receiving preventative treatment during pregnancy increased from 72 per cent to 78 per cent. Access to malaria diagnosis and treatment also increased, particularly at the community level, with 25 per cent of the population accessing the services (HMIS 2015). These interventions have led to reductions in malaria morbidity and mortality.

The plan’s goal is to reduce malaria deaths from 15.2 deaths per 100,000 population per year in 2015 to fewer than five deaths per 100,000 by 2021.

**Tuberculosis: 47 people a day die of it in Zambia**

According to the WHO, Zambia is one of the 30 countries in the world with high tuberculosis and TB-HIV burden. Since 2000, Zambia has successfully implemented three national TB strategic plans.

The current plan’s objectives are to reduce the number of TB deaths in the population by 40 per cent in 2021 compared with 2015, and to increase the number of notified cases of new TB episodes from 36,700 in 2015 to at least 59,000 in 2021.

During the period 2014 to 2016, Zambia successfully conducted the first ever national Tuberculosis Prevalence Survey. It is now known that the country has a higher and more unevenly distributed TB burden than previously estimated.

According to Zambian Government figures, every year an estimated 62,000 people fall ill to TB and an estimated 17,000 die of TB every year, roughly 47 a day. The ministry of health figures that about 23,000 TB patients remain undetected because they fail to go for screening services and or deliberately just ignore their persistent coughs.

**Other performance indicators**

A glance at the progress in other selected indicators:

- Remarkable improvements have been achieved in reducing the maternal mortality rate from 591 deaths per 100,000 live births in 2007 to 398 in 2014. Despite the decrease, maternal mortality is still high in absolute terms. Zambia was not able to achieve its target of 162 deaths per 100,000 live births at the end of 2015.

- There is now a government programme to scale up nutrition, fortify salt with iron and sugar with Vitamin A. Just over half (52 per cent) of all deaths occurring in children below the age of five are due to under nutrition (United Nations Children’s Fund [UNICEF] 2008; Department for International Development 2011). Over half (54 per cent) of children under
the age of five and 13 per cent of women of child bearing age are vitamin A deficient (National Food and Nutrition Commission [NFNC]).

- Steady progress has been made in child health in Zambia; this is exemplified by the reductions in the morbidity and mortality. Between 2002 and 2014, mortality under the age of five fell from 168 per 1,000 live births to 75. Infant mortality declined from 95 per 1,000 to 45.

- The Zambian population is predominantly young, with about 53 per cent below 18 years of age, 50 per cent aged 14 and under, and 18 per cent below the age of five. Overall staffing challenges in the health sector have not spared pediatrics programs, and there is need for scaled training that is tailored towards addressing the gap.

Conclusion

Zambia has made tremendous progress in improving the health status of its population, but many challenges remain.

In the words of Health Minister Dr. Chitalu Chilufya, through the integrated community and primary health care approach, the country will achieve reduction in maternal and child mortality rates, malaria elimination and reduction in the incidence of HIV, among other key health outcomes.

Zambia’s National Health Strategic Plan for 2017-2021, which envisions a prosperous country in which all Zambians have access to quality health services, is a comprehensive blueprint for implementing the Government’s objectives.

“We acknowledge that good health is a function of not only health care services, but also other socioeconomic factors which include education, agriculture, housing, water and sanitation,” Dr. Chilufya said. “Therefore, this document emphasizes strong multi-sectoral collaboration to address all the social determinants of health.

“This plan envisions a prosperous country where all Zambians have access to quality health services. As a government, we are committed to sustaining the gains made in the past five years, and to expanding the coverage and improving the quality of health services provided to our people.”

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Introduction of authors

Atiq ur Rehman: He holds a PhD in HRD. He is the Director of Asian Centre of Organization Development, Islamabad, Pakistan. His email is: aatiq19@gmail.com

Muhammad Atiq: He holds a Master’s in Rural Development and is a Bachelor of Agronomy. Muhammad is a development practitioner with over 15 years experience in program development, project management, stakeholder engagement and team building in Pakistan.

Sandiran Premakanthan: He is the Founder President/Chair of IOCOM. He holds a Master's in Business Administration (MBA) from the University of Ottawa with concentration in Finance, Accounting, Auditing and Evaluation. He is the President and Principal Consultant of Symbiotic International Consulting Services (SICS), Ottawa, Canada.

John T. Njovu: Mr. Njovu is globally renowned as an M&E expert and researcher. He is Zambian and an independent Consultant. He has over 30 years successfully accomplished assignments in the private and public sectors. These have included auditing, evaluation, financial management and research.
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Outcome management ecosystems

This concept of business ecosystems could be adopted to develop a tree of outcome management ecosystems. Here are some examples of outcome management ecosystems:

● Leadership and people management ecosystem and subsystems: leadership development, leaders & managers, union-labour management, strategic planning and management, facets of human resources management; building & leading teams, negotiation and conflict resolution, complex employee behaviours in the workplace; motivating people, recruitment, retention, staff/employee appraisals, career & professional development, building employee capabilities, stress management, work-life balance, women & gender studies, organizational justice, participatory management.

● Financial, accounting and banking ecosystem and sub-systems: corporate finance, international finance, forensic accounting and fraud investigation, financial economics; cost-benefit analysis, contribution analysis, banking ecosystems: money laundering, digital currency, fintech, cryptocurrency, financial inclusion, innovative financial solutions for poor (micro financing); financial insurance; financial risk management: risk & loss control management.

● Business management/administration ecosystem and subsystems: business economics; business law, organizational behaviour, business ethics; business continuity, international business/trade; marketing and distribution; management reporting.

● Oversight management ecosystem and interconnected sub-systems: audit, evaluation, total quality management (TQM) and ISO family of standards; continuous improvement, auditing ecosystems: auditing environmental and occupational health & safety (OH&S) management systems.
• Government and non-government organizations (NGO) management ecosystem and sub-systems; good governance, open government, public management/administration, NGOs contribution to social and economic development, Indigenous people and governments, provincial/state and municipal and local governments, organizational diversity, gender and minority issues at workplaces, cultural diversity, diversity and talent management, social and functional categorization, diversity and ethical issues.

• Digital economy management ecosystem and sub-systems: digitization, automation, digital transformation, transparency in e-government, e-democracy, citizen-centric e-government, development of smart cities, integration of e-government initiatives, challenges to digital governments. managing change during the implementation of e-government initiatives, trends in e-governance.

• Information technology and information management ecosystems and sub-systems: Information resource management; information and communication technology (ICTs); digital preservation, cybersecurity, internet, data ecosystem including big data, data analytics; artificial intelligence, blockchain, machine language.

• Learning and innovations ecosystem, and sub-systems management of innovation; learning ecosystem, learning culture, learning fit, measurement, innovation ecosystem, start-ups ecosystem, technology eco-system; innovation, law, and technology.

• Industrial/manufacturing management ecosystems and sub-systems: product design and development, production management; plant maintenance; statistical quality control, quality assurance; productivity sciences ecosystems: industrial engineering/work study (motion & time study), method study (process re-engineering), work measurement, ergonomics and workplace design; operations management; robotics.

• Supply chain management ecosystem and sub-systems: logistics, procurement, product life cycle management, asset management, supply chain planning, supply chain enterprises applications; supply chain visibility, green supply chain, risk and supply chain resilience, integrated logistics hubs, one belt one road (OBOR).

• Engineering management ecosystems and sub-systems: civil engineering; mechanical engineering, electrical and electronics engineering, aeronautical engineering, architectural engineering, computer & software engineering, environmental science engineering.

• Agricultural management ecosystem and sub-systems: agricultural policies, agricultural management services, food security and environment, sustainable agriculture, gender in agriculture, trade of agricultural commodities, World Trade Organization (WTO) agreement on agriculture, use of digital technology in agriculture, land grabbing, natural disasters and resilience;
Health management/administration ecosystem - sub-systems: patient care, health outcomes and quality of life; health information systems ecosystem: eHealth: informatics, innovations and information systems; occupational health & safety: law & regulations; occupational hygiene; health law, ethics, & policy; health administration, health education and promotion, health risk communication, patient outcome management, midwifery, indigenous medicine, specialized health ecosystems – cardiovascular, quality of life, health emergency response management, health services research, health insurance, medicare system, dental care and dental hygiene, pharma care and pharmaceutical outcome research management and policy.

Criminal justice administration ecosystem and sub-systems: criminal law; law enforcement (law & order), legal administration, offender (correctional) management; parole system, crime & socio-legal studies, e-justice.

Education management ecosystem and sub-systems: educational administration; e-educational environments; educating citizens of the 21st century; collaborative learning culture; collective intelligence; emotional education (social and emotional well-being); ecology of learning ecosystem: families, schools, community, networks and society.

Environmental management ecosystems and sub-themes: An ecosystem consists of all the living and non-living things in a specific natural setting including plants, animals, insects, microorganisms, rocks, soil, water and sunlight are major components of many ecosystems: two types: terrestrial (forest; grassland; desert and tundra) and aquatic (fresh water; and marine). Other related sub-themes include climate change, air pollution control and greenhouse effect, alternative sources of clean energy (wind, hydro and solar) and conservation of species.

Four possible levels of outcome management ecosystems and sub-systems:
- Those driven by clusters of management and technical disciplines;
- Those driven by sector agendas: agriculture, education, health, social services and so on;
- Those driven by national (country) level results agendas (political agendas); and
- Those driven by international and global agendas: climate change, sustainable development goals, World Health Organization (WHO) and other United Nations (UN) agendas.

With kind regards,

Editorial Team
Volume 6, No 2  Apr – Jun 2020

Issue 6.2 Education management ecosystem and sub-systems: educational administration; e-educational environments; educating citizens of the 21st century; collaborative learning culture; collective intelligence; emotional education (social and emotional well-being); ecology of learning ecosystem: families, schools, community, networks and society.

Last date for the submission of articles: April 30, 2020

Volume 6, No 3  Jul – Sept 2020

Issue 6.3 Environmental management ecosystems and sub-themes: An ecosystem consists of all the living and non-living things in a specific natural setting including plants, animals, insects, microorganisms, rocks, soil, water and sunlight are major components of many ecosystems: two types: terrestrial (forest; grassland; desert and tundra) and aquatic (fresh water; and marine). Other related sub-themes include climate change, air pollution control and greenhouse effect, alternative sources of clean energy (wind, hydro and solar) and conservation of species.

Last date for the submission of articles: May 31, 2020

General Submission Guidelines

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