IN AUGURAL LECTURE

RURAL HEALTH

The Way Forward

Prof. Dr Osman Ali
Sekolah Perubatan
Universiti Malaysia Sabah
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Prof. Dr Osman Ali
Sekolah Perubatan
Universiti Malaysia Sabah
# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>CPD</td>
<td>Continuous Professional Development</td>
</tr>
<tr>
<td>GTP</td>
<td>Government Transformation Programme</td>
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<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communications Technology</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MOHE</td>
<td>Ministry of Higher Education</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
</tr>
<tr>
<td>NHMS II</td>
<td>Second National Health and Morbidity Survey</td>
</tr>
<tr>
<td>NHMS III</td>
<td>Third National Health and Morbidity Survey</td>
</tr>
<tr>
<td>NKRA</td>
<td>National Key Result Areas</td>
</tr>
<tr>
<td>PHC</td>
<td>Primary Health Care</td>
</tr>
<tr>
<td>PUPUK (UFCFCW)</td>
<td>Program Perkongsian Universiti-Keluarga University-Family Partnership in Community</td>
</tr>
<tr>
<td>RMEC</td>
<td>Rural Medical Education Centre</td>
</tr>
<tr>
<td>UMS</td>
<td>Universiti Malaysia Sabah</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>WONCA</td>
<td>World Organisation of National Colleges and Academics</td>
</tr>
</tbody>
</table>
Inequities and inequalities in health care provision still persist in many countries. The disparity between developing and developed nations and between the urban and rural population is a real issue and challenge in health care delivery. The major contributors to the crisis are the shortage and maldistribution of health care professionals worldwide. There is a shortage of doctors, nurses, midwives and allied health professionals in most countries and the most severe is in the poorest countries. The shortage and maldistribution are affecting the provision of health care especially in the rural areas. In most cases, lack of educational opportunities and facilities in rural areas has lowered the interest of doctors to practise in these areas. Some of the strategies to attract health professionals to choose rural areas for service are by increasing the number of students with rural backgrounds for medical training and by increasing the exposure of undergraduate students to rural settings and environments. To retain health professionals in the rural areas, more flexible, integrated and coordinated vocational training programmes and specifically-tailored continuing education and professional development programmes have to be instituted immediately to meet the identified needs of rural family physicians, supported by sophisticated and relevant ICT infrastructures. Medical schools should take the responsibility to educate appropriately-skilled doctors to meet the needs of the population in their respective geographic regions. Sekolah Perubatan, Universiti Malaysia Sabah has taken a proactive step in producing doctors who are culturally-sensitive to the needs of the local population, while at the same time developing skills to function effectively in any community. Community-based education, especially the PUPUK (UFPCWP) programme implemented in the medical curriculum is one of the initiatives to attract more medical graduates and other health professionals to the rural areas, especially in Sabah to practise medicine while at the same time having an opportunity to develop and empower the community.
The new world order did not bring equal opportunities to all the populations in the world since the rich and strong countries are still oppressing the poor and underprivileged. The gap between the rich and the poor is widening within countries. The rule of 10/90 is still existing and in fact, the inequality in health care is widening. The challenge in most countries is to empower the community to be involved in the provision of health care at a lower cost. In most of developing and underdeveloped countries, the resources of the community have been underutilized. Partnerships between the public sector and the private sector to maximise the resources have not been encouraged. It is well known through experience in developed countries that community involvement in the planning, organization, and management of health care, including self-care will lead to self-reliance in health. This is very important strategy and challenge in providing equitable health care for all, especially the rural communities.

The Alma Ata Declaration of 1978 recognised health as a fundamental human right (Hall and Taylor, 2003). It urged all governments to be responsible for the health of their people that could be fulfilled only by the provision of adequate health and social measures. The people have the right and duty to participate individually and collectively in the planning and implementation of their health care. The role of higher learning institutions in community development should not be underestimated. Their involvement in the training of health care professionals such as
doctors, nurses and laboratory technicians in providing services to rural communities is a very important element on the way forward towards achieving health for all.

This lecture will examine issues concerning the life of rural people and some of the strategies that are effective in improving the health status of these people and the role of higher learning institutions towards achieving the millennium health goals. It will also look at effective ways of delivering primary care in the rural health service. The best approach to recruitment and retention of health care professionals in rural areas will be discussed. Finally, the optimum skills mix in the health care team and their training in a rural district will be reviewed.

**Definition of Health**

Different people have different definitions and perceptions of health. Does it mean that when an individual is free from any sickness or disease, he is considered healthy? The Webster’s Dictionary has defined health as the condition of being sound in body, mind or spirit and especially free from physical disease or pain (Webster’s Online Dictionary, 2010). On the other hand, the Oxford English Dictionary has defined it as soundness of body or mind; that condition in which their functions are duly and efficiently discharged (Oxford English Dictionary, 2010). Perkin, however, has defined health as a state of relative equilibrium of body, form and function which results from its successful dynamic adjustment to forces tending to disturb it (Osman Ali, 2009). It is not a passive interplay between body substance and forces impinging upon it but an active response of body forces working towards readjustment. This implies that health is not an ideal state and there are no international standards fixed for health. However, the most widely accepted definition of health is given by the World Health Organization (WHO), which states that health is a state of complete physical, mental, social and spiritual well-being and not merely an absence of disease or infirmity (World Health Organization, 2010). In this definition, health has been associated with four aspects or dimensions, which are physical, mental, social and spiritual. Physical well-being means having the
physical strength, endurance and energy to work towards our goals. Mental well-being is the ability to cope with the world in a way that brings satisfaction whilst social well-being means development of meaningful relationships with others. Based on the WHO definition of health, the goal of health calls for not only the cure or alleviation of disease but also calls for prevention of disease. It includes an effort to strive for maximum physical, mental social and spiritual efficiency for the individual, for his family, and for the community.

Health is affected by many factors. The holistic model of health has been accepted as more comprehensive since it combines the various concepts of health either biomedical, ecological or psychosocial (Osman Ali, 2009). It recognises the strength of social, economic, political and environmental influence on health. The holistic concept implies that, all sectors of society have their respective effects on health, in particular, agriculture, animal husbandry, food, industry, education, housing, public works, communications and health sectors. The emphasis is on promotion and protection of health. It is more prominent in areas where the socio-economy is low and the environmental quality is declining especially in the rural areas.

**Public Health and Rural Health**

How are we going to promote and protect health of the community? Winslow in 1920, has defined public health as the science and art of preventing disease, prolonging life and promoting physical health and efficiency through organised community effort for sanitation of the environment, control of community infections and education of individuals in the principles of personal hygiene. The organisation of medical and nursing services for early diagnosis and preventive treatment of disease and the development of the social machinery will ensure that every individual in the community will benefit a standard of living adequate for the maintenance of health. It is very clear that public health embraces all aspects of human development while emphasising the importance of prevention and community development (Wikipedia, 2010).
Rural Health is the interdisciplinary body of scientific knowledge related to the health status of people in the rural areas, factors affecting the health status and the clinical practice and health care delivery appropriate for protecting their health (Wikipedia, 2010). The strategy in protecting health among the community in rural areas is different from that for the urban areas. The rural health practitioners should have the skill and competency in both general practice and public health. This skill can be developed through rigorous medical training not only in the clinical setting but also in community service. Higher learning institutions have an important role to play in producing the right human capital appropriate to the specific region and areas.

**Health Challenges in Rural Areas**

Health for all by the year 2000 was not fully achieved since the inequity was very wide among the less developed countries, especially in Africa and Asia (Van de Poel E et al., 2008). The main obstacle was the widespread poverty in the population especially in the rural areas. Poverty has been responsible for most of the health challenges today, such as high mortality and morbidity among children and mothers and persistently high incidence of communicable diseases and nutritional disorders (OECD, 2003; Amuna and Zotor, 2006). Although global poverty rates are falling, some parts of the world are still persistently poor. Global recession and financial instability affect the poor in many countries, especially in the poorest ones. Primary education, especially among women in underdeveloped countries, is still lacking and the gender gap is still prominent in rural communities in many parts of the world. Although the mortality rate among children and infant has been declining due to better nutrition and increased health status, the number of children dying from preventable and treatable diseases is still very high. About 30,000 children die daily due to these diseases (UNICEF, 2010). AIDS has become the leading cause of premature deaths in many countries. Other communicable diseases such as malaria and
tuberculosis, which are considered under control are still prevalent and pose a public health problem in many countries. The emergence of resistant strains of malaria and HIV-related tuberculosis has made the preventive programme more challenging.

**The Millennium Development Goal (MDG)**

At the beginning of this millennium, the United Nations declared the fight against poverty in its declaration of Millennium Development Goals (MDG) (United Nations, 2010; WHO, 2010). In this millennium, all countries in the world should work together to fight against poverty and its associated factors. The eight major millennium goals include eradicating extreme poverty and hunger, achieving universal primary education, promoting gender equality, reducing child mortality, improving maternal health, combating HIV/AIDS, malaria and other infectious diseases, environmental sustainability and global partnership for development. All the goals are related to elevation of the health status and alleviation of diseases. At present, some regions have managed to reduce hardcore poverty but there are areas that of increasing concern. Malaysia is expected to be able to eradicate poverty before 2015, through three effective strategies. These include agricultural and rural development to improve farmers’ income, providing labour-intensive industries and investment in education, health and infrastructure, especially in rural areas (OECD, 2003).

**Society Transformation**

Naisbett in his best-seller, Megatrends 1984, predicted the major transformations in the society now and in the future (Megatrends 2000, 1990). These include major changes from national economy to global economy, from industrial society to information society, from low technology to high technology, from institutional help to self-care and empowerment. Even though the trends have been observed in USA, similar changes have been shown in many countries and many parts of the world. These megatrends have posed great challenges in all aspects of our life including health.
Challenges of Health Care Delivery

Some of the challenges identified as affecting health care delivery include epidemiology and demographic transition, changing lifestyles, increasing consumer awareness and rights, environmental degradation and increased pollution, maldistribution and inequality of services, the explosion in knowledge and technology, increasing health care cost and trends towards specialisation (Osman Ali, 2000). These changes may affect the whole community but the worst-affected will be the rural and remote populations. Unless the Government takes an initiative to identify the impact of these changes to rural health services, the inequality and inequity will be widened and these segments of the community will suffered the most.

Epidemiology and Demographic Transition

Rapid modernisation and urbanisation have been responsible for the increased in the mortality and morbidity of diseases due to change in the behaviour of the people such as sedentary living, excessive and ill-balanced diet, smoking and environmental degradation (Osman Ali. 1999). Communicable disease mortality had declined, whereas neoplasm mortality has increased tremendously. This epidemiologic transition is a real phenomenon and has become the reason for the introduction of new public health (Tulchinsky T.H. and Varavikov E., 2009). If the old public health concerned with conditions or diseases related to unhealthy settlements, safety of air and water, infections and poverty, new public health will give more attention to increasing longevity, over population, industrialisation, inequities in health, environmental degradation and the negative impact of globalisation.

There is also a widespread increase in life expectancy and better quality of life throughout the world. Many people survive to their old age. This will lead to an ageing society and increased burden of social security. Needs arise on hospital care, nursing home for pensioners, facilities for the disabled, geriatric physicians
and rehabilitation nurses. The incidence of stressful events such as family breakdown, loss of job, social and values disintegration has threatened the mental health of the population, especially in the rural areas.

**Changing Lifestyles**

Lifestyle refers to the way people live (Wikipedia, 2010). Lifestyles are learnt through social interaction with parents, peer groups, friends and siblings and through school and mass media. Lifestyle is composed of cultural and behavioural patterns and lifelong personal habits that have developed through processes of socialisation. Many of the health problems are associated with lifestyle changes such as lack of sanitation, poor nutrition, personal hygiene, habits, customs and cultural patterns. On the other hand, positive or healthy lifestyles like adequate nutrition, enough sleep, and sufficient physical activity will help to promote health. Most of the heart diseases, hypertension, and obesity and Type 2 diabetes mellitus are related to lifestyles. These diseases can be prevented if the behaviour is changed. Their incidence may go down if effective health education such as anti-smoking campaign is carried out and higher cigarette taxes are imposed to reduce smoking and hence the incidence of lung cancer and coronary heart disease. However, the services provided must suit the need and lifestyles of the community.

**Increasing Consumer Awareness and Rights**

The need and demand for better health services by the community have become a great challenge to health providers and the Government. Increased socio-economy, high purchasing power, good ICT facilities, and increased education levels, awareness of individuals and community rights contributed to the needs and demands of the community. A country bearing the heavy burden of medical cost is forced to carry out health reforms. Many countries introduced a system of health financing through insurance. This
system, if not managed properly, can cause widening health gap between people who can afford to pay and those who cannot. This can lead to dissatisfaction of the people and political instability.

**Environmental Degradation and Pollution**

The population has increased exponentially. Currently, an estimated 6 – 7 billion people inhabit the Earth. The demand of food, water, energy, shelter, sanitation, and waste disposal have increased tremendously. People need water and energy to live. It is estimated that currently 1.2 billion people lack portable water and the matter will get worse in the future. Widespread destruction of forests, due to development, has caused the near extinction of flora and fauna with medicinal values that may be critical for future drug discovery. Burning of fossil fuels, especially oil and gas, produces greenhouse gases leading to global warming and climate change. Industrialisation, on the other hand, produces hazardous particulate matter and toxic gases causing air and water pollution.

**Maldistribution and Inequality of Services**

Good governance demands allocation of resources in more critical areas especially when the resources are limited. However, in reality the budget allocation for rural areas, where the need is much higher, is usually less compared to that for urban areas. The 90/10 divide (90% of the resources for 10% of the population) is a reality in many situations. These inequalities impose a greater strain on the rural community who are already suffering from various other maladies.

**The Explosion in Knowledge and Technology**

The availability of abundant and meaningful information and technologies has increased the ability of the individual and society to make informed choices. The use of the internet and networking has changed our way of doing things and making decisions on
health. The use of ICT in health surveillance, health information dissemination, monitoring and telehealth has changed our perceptions on health. Health is no more the right of health providers but it also the right of the people.

**Increasing Health Care Cost**

The demand for better services and high expectation of the people may lead to a litigious society and the emergence of defensive medicine. The medical profession will limit their skills to certain specialisations considered safe to prevent litigation for negligence and medical errors. Medical practitioners will perform many unnecessary investigations and procedures on patients to avoid misdiagnosis or mistreatment. Very expensive high-technology medical diagnostic machines and high-end therapeutic equipment will be introduced, especially by private practitioners, to prevent misdiagnosis and delays in treatment. This will increase the medical bills and health charges.

**Trend towards Specialisation**

Explosion of knowledge and information has increased people's expectation of the medical profession, leading to over-specialisation. Many specialties will branch out into smaller subspecialties, so that practitioners can focus their expertise and skills on certain disciplines or areas of treatment. Although some patients may benefit from such specialised-care or therapeutic procedures by the specialists, the public can expect to pay more for the service, since some systemic illnesses will be cared for by several specialists, each operating in their narrow specialty area.

**Increasing Private Sector Growth in Health Care**

In order to meet the demands of an increasingly educated society, health services are becoming a tradable commodity. The Government can no longer afford to meet the increasing demands
of the community, especially for high-end technologies for diagnosis and treatment of diseases. The private sector has been given more roles and responsibilities to provide health care for the community, especially in urban areas. However, in most rural and remote areas, health services are still the government’s obligation in most of the countries.

**Globalisation**

This is a situation where there is no restriction in movement of people, goods and services from one country to another or trading occurs in a borderless world. Developed countries have an advantage of marketing their products and services to less developed countries. Even though the less developed countries may benefit from the presence of trained work force and high technology services, they may be under pressure due to economic domination and oppression by foreign operators. In the field of health, developed countries may sell drugs and equipment at high cost to cover the cost of technology and research needed to develop them. This will increase the cost of clinical services in many poor countries, due to imported expensive diagnostic technologies.

**RURAL HEALTH IN MALAYSIA**

Malaysia is a tropical country inhabited by 27.2 million people. Generally, Malaysia has achieved a significant reduction in infant and children mortality rates and a decline in the prevalence of communicable diseases. A health care delivery system has been established with a clear mission and vision to achieve optimum wellness of the population.

**Health Transition in Malaysia**

Forty-four per cent of the Malaysian population resides in rural areas (Earthtrend, 2010). Since independence, Malaysia has undergone rapid changes in socioeconomic and health care delivery. Starting with an economy based on agriculture and natural resources,
Malaysia has experienced rapid economic growth through industrialisation. The current emphasis is to stimulate private sector development, particularly in the service-based economy, innovation and high technology. Changes in the economy affect the development of infrastructure and peoples’ lifestyles. Status and quality of life of the people have improved tremendously (Osman, 1999). This is illustrated by the decline in infant mortality rate (IMR), maternal mortality rate (MMR), toddler mortality rate (TMR), and increasing peoples’ life expectancies (Table 1). The life expectancy at birth was less than 60 years in 1957 (independence), but now it has increased to 77 years for the female and 72 years for the male, (Figure 1). Birth rates and death rates have decreased. The overall incidence of infectious diseases, such as tuberculosis, malaria, gastroenteritis, cholera and typhoid has decreased. However, there has been a marked increase in non-communicable diseases such as hypertension, coronary heart disease, diabetes mellitus and cancer. Epidemiological transition is occurring because of improved standards of living, food, education, and hygiene, the supply of safe water, good housing and excellent health care services.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Life expectancy (year)</td>
<td>65</td>
<td>68</td>
<td>70.7</td>
<td>73</td>
<td>74.2</td>
</tr>
<tr>
<td>Crude birth rate</td>
<td>32.4</td>
<td>30.6</td>
<td>27.9</td>
<td>24.5</td>
<td>22.5</td>
</tr>
<tr>
<td>Crude death rate</td>
<td>6.7</td>
<td>5.3</td>
<td>4.6</td>
<td>4.4</td>
<td>4.2</td>
</tr>
<tr>
<td>Infant mortality rate (per 1,000 live birth)</td>
<td>39</td>
<td>28</td>
<td>15</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Maternal mortality rate (per 100,000 pop)</td>
<td>160</td>
<td>60</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Doctor : population</td>
<td>1 : 4,320</td>
<td>1 : 3,800</td>
<td>1 : 2,656</td>
<td>1 : 1,490</td>
<td>1 : 1,300</td>
</tr>
<tr>
<td>Primary health care facilities</td>
<td>-</td>
<td>-</td>
<td>2,103</td>
<td>1,924</td>
<td>2,874</td>
</tr>
<tr>
<td>Telephone per 1,000 population</td>
<td>1.0</td>
<td>2.9</td>
<td>9.7</td>
<td>41.9</td>
<td>74.5</td>
</tr>
<tr>
<td>Length of road (km)</td>
<td>10,182</td>
<td>14,446</td>
<td>39,113</td>
<td>68,770</td>
<td>71,814</td>
</tr>
</tbody>
</table>

Source: Department of Statistic, Malaysia / UNdata
Epidemiological transition in non-communicable or lifestyle diseases could be seen from the trend of several diseases such as diabetes mellitus, hypertension and coronary heart disease over time. Comparing the Second National Health and Morbidity Survey (NHMS II) (1996) and Third National Health and Morbidity Survey (NHMS III) (2006), known diabetes in adults of 30 years and above, has increased from 5.7% to 9.5% in the past 10 years. Similarly, newly-diagnosed diabetes rose from 2.5% to 5.5%. This means that the overall prevalence of diabetes rose from 8.3% in 1996 to 14.9% in 2006 (MOH, 2008). This change is very high and could burden the Government financially in the long-term. The epidemiologic studies in this area are shown in Table 2.

<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Description</th>
<th>Key findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1989</td>
<td>A cross-sectional study of 515 Malay adults in Kuala Selangor.</td>
<td>The prevalence was 3.9%.</td>
</tr>
<tr>
<td>2</td>
<td>1989</td>
<td>A cross-sectional study among Malays in Tanjung Karang, Selangor (322 adults)</td>
<td>The prevalence of locomotor disability was 3.9%, mainly due to trauma.</td>
</tr>
<tr>
<td></td>
<td>The relationship between malnutrition and endocrine disorder among Malays and aborigines in Malaysia.</td>
<td>1992</td>
<td>A cross-sectional study conducted among Malays and Orang Asli (1419 subjects).</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>1992</td>
<td>227 children from these villages were measured.</td>
<td>Traditional village - 13% stunted, 8% wasted, 17% underweight, vegetable farming - 4.0% stunted, 12.9% wasted, 13.9% underweight, flats - 16.5% stunted, 10.2% wasted, 20.2% underweight</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Malnutrition among children in traditional village, vegetable village and urban flats.</td>
<td>1992</td>
<td>A cross-sectional study among Malays and aborigines in Hulu Langat.</td>
</tr>
<tr>
<td>5</td>
<td>PEM, thyroid hormones and goitre among Malaysian aborigines and Malays.</td>
<td>1992</td>
<td>A cross-sectional study among Malays and aborigines in Hulu Langat.</td>
</tr>
<tr>
<td>6</td>
<td>Physical growth of Malay children from wealthy families at Taman Tun Dr Ismail.</td>
<td>1993</td>
<td>Anthropometric measurement pattern of Malays children from wealthy families in Taman Tun Dr. Ismail (900 children 3 – 12 years old).</td>
</tr>
<tr>
<td>7</td>
<td>The prevalence of diabetes mellitus among Malaysian aborigines and Malays.</td>
<td>1993</td>
<td>A cross-sectional study conducted among Malays and Orang Asli in six rural and urban locations (706 adults).</td>
</tr>
<tr>
<td>8</td>
<td>Thyroid function and pubertal development in malnutrition.</td>
<td>1994</td>
<td>A cross-sectional study among 1136 subjects of different socioeconomic status.</td>
</tr>
<tr>
<td>9</td>
<td>Iodine contents in urine among Malays and aborigines in Pahang.</td>
<td>1994</td>
<td>Contents of iodine in urine of 1419 subjects were measured using alkaline ashing method.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>10</td>
<td>The prevalence of goitre in remote island versus coastal areas.</td>
<td>1995</td>
<td>A cross-sectional study among the Orang Asli in remote inland and coastal areas (871 subjects)</td>
</tr>
<tr>
<td>11</td>
<td>Prevalence of goitre among Malaysian aborigines and Malays.</td>
<td>1995</td>
<td>A cross-sectional study among 1419 subjects of the Orang Asli and Malays.</td>
</tr>
<tr>
<td>12</td>
<td>Nutritional status of women and children in Malaysian rural population.</td>
<td>1995</td>
<td>A total of 262 women aged 18 and over and 183 children aged 2 – 6 were measured.</td>
</tr>
<tr>
<td>13</td>
<td>Changing prevalence of diabetes mellitus amongst rural Malays in Kuala Selangor over 10-year period.</td>
<td>1996</td>
<td>A cross-sectional study among 360 subjects in Kuala Selangor.</td>
</tr>
</tbody>
</table>
Blood glucose and glycosylated haemoglobin among Malays and aborigines in Malaysia.

A cross-sectional study among 1136 subjects aged 7 years and above.

There was a significant difference, the mean Fasting blood glucose (FBG) and HbA1c among Malays and Orang Asli.

**Rural Urban Disparity**

Rural areas often associated with poverty, difficult communication, lack of infrastructure and public facilities, and most of the people are involved in agriculture. These conditions affect the incidence of diseases and health problems in the area. NHMS III shows that there are significant differences between urban and rural areas in terms of incidence of diseases and health problems (MOH, 2008) (Table 3). It is obvious that people in rural areas suffer from poverty-related diseases and negative lifestyles. These differences require different approaches in the delivery of health services.

**Table 3** Rural-urban differences in health conditions (NHMS III)

<table>
<thead>
<tr>
<th>Health conditions / utilisation</th>
<th>Rural (%)</th>
<th>Urban (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Acute respiratory tract infection (ARI)*</td>
<td>20</td>
<td>16.9</td>
</tr>
<tr>
<td>2 Acute diarrhoeal illness (ADI)</td>
<td>5.5</td>
<td>4.7</td>
</tr>
<tr>
<td>3 Recent illnesses/ injuries</td>
<td>25.5</td>
<td>22.4</td>
</tr>
<tr>
<td>4 Injuries at home</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- on the road</td>
<td>7.4</td>
<td>5.9</td>
</tr>
<tr>
<td>- at the workplace</td>
<td>4.8</td>
<td>4.1</td>
</tr>
<tr>
<td>- at recreational areas</td>
<td>5.8</td>
<td>4.3</td>
</tr>
<tr>
<td>- at school</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>5 Physical inactivity</td>
<td>40.1</td>
<td>45.6</td>
</tr>
<tr>
<td>6 Smoking (&lt;18 year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- ever smoker</td>
<td>18.4</td>
<td>12.3</td>
</tr>
<tr>
<td>- current smoker</td>
<td>11.5</td>
<td>6.9</td>
</tr>
<tr>
<td>- establish smoker</td>
<td>4.9</td>
<td>2.3</td>
</tr>
<tr>
<td>- experimental smoker</td>
<td>1.2</td>
<td>0.9</td>
</tr>
<tr>
<td>- passive smoker</td>
<td>28.5</td>
<td>25.6</td>
</tr>
</tbody>
</table>
6 Smoking (> 18 year)
- ever smoker 32.3 24.1
- current smoker 26.2 19.0
- passive smoker 22.4 20.6

7 Alcohol intake
- ever consume 10.4 18.8
- current drinker 8.9 4.2

8 Diabetes mellitus*
- Adult 12.2 10.6

Psychiatric illnesses
- adult 8.5 12.6
- children 21.2 19.7

9 Malnutrition
- underweight among adults 9.8 7.8
- underweight among children 16.0 11.4
- stunting 19.4 13.5

10 Health-seeking behaviour for recent illness 57 58.8

11 Women's health
- breast examination (all methods) 68.4 72.4
- pap smear examination 45.0 43.1

*significant difference

Nation Transformation

Changes that occurred in Malaysia did not happen overnight. Since independence, the Government has introduced various policies to develop Malaysia. Vision 2020 was introduced in 1990 with the objective of transforming Malaysia into a united nation with a confident Malaysian society that is democratic, liberal, tolerant, moral, ethical, caring, economically just and equitable, as well as progressive and prosperous. However, due to various external factors, Malaysia has suffered from slow economic growth in the last five years. If the slow rate of growth continues, Malaysia will not be able to achieve the Vision 2020. Drastic changes or transformation need to be introduced quickly to release Malaysia from the middle-income economic trap and move forward to become a developed country. The Most Honourable Dato' Seri Najib Abdul Razak introduced the concept of four main pillars and four supporting ones in April 2009 to catalyse the economic transformation. Its aims to transform the government to be more
effective in service delivery and bring Malaysia towards a developed nation, united and just, with a high standard of living. The four main pillars include the concepts of 1Malaysia, “People First, Performance Now”, Government Transformation Programme (GTP), New Economic Model and the Tenth Malaysian Plan. These pillars are supported by Speed, Integrity, Meritocracy and Value-for-Money.

The 1Malaysia concept was introduced by the Prime Minister as a continuation of the struggle of past leaders. With the tagline “People First, Performance Now”, the idea is to foster the unity of the people and communities of Malaysia (national unity) and improve the well-being of the people. A new generation of people will develop without being limited by their racial identities, evolving a fighting spirit and focusing towards the formation of a developed nation. Interests of the people will always prevail and no one will be isolated from national development. Eight core values that should be applied to achieve this concept include developing a culture of excellence, courage, humility, acceptance, loyalty, meritocracy, education and integrity (Najib Abdul Razak, 2010).

In the transformation plan (GTP), the Prime Minister of Malaysia has introduced six National Key Result Areas (NKRA). They include effort to reduce crime, fight against corruption, expanding access to quality and affordable education, improve the living standards of low income people, strengthen the infrastructures in rural and remote areas and improve public transportation (Najib Abdul Razak, 2010). Of the six NKRA, two focus on improving rural livelihoods, especially amongst the people in Sabah and Sarawak. The Government is committed to the eradication of hardcore poverty by the end of 2010 through various programmes, including empowering women through the Amanah Ikhtiar Malaysia Programme with financial support from the Department of Social Welfare. In enhancing rural infrastructure, 750 km of road is expected to be completed in Sabah and Sarawak by the end of 2010 and another 1500 km under RMK10. These roads will connect two million people in rural areas to the nearest urban areas. This will definitely cause a great impact, in terms of marketing of rural products (economic) and access to medical facilities. Water
supply will also be increased in Sabah and Sarawak from 62% currently to 90% by 2012. These measures will definitely boost the country at a higher level of development in the future.

At the same time, the National Economic Advisory Council introduced the New Economic Model (NEM) formulated by the Economic Planning Unit (EPU) under the Tenth Malaysia Plan. Each programme must be read in the context of the principles of 1Malaysia to achieve a high-income country by 2020.

**Health Transformation**

Health transformation is one of the critical components to achieve Vision 2020. It states that Malaysia is to be a nation of healthy individuals, families and communities, through a health system that is equitable, affordable, efficient, technologically appropriate, and environmentally adaptable and consumer friendly, with emphasis on quality, innovation, health promotion and respect for human dignity. It promotes individual responsibility and community participation towards an enhanced quality of life (Merican, 2004). The eight service goals of the health care system are to promote individual wellness (wellness focus), service the needs of the person (person focus), provide prompt and accurate information so that everyone can make informed health decisions (informed person), empower a person to manage own health, through knowledge acquired from health providers (self-help), provide services close to home, and receive integrated care (seamless), provide customised service and an effective, efficient and affordable service. This whole system is still based on primary health care principles. It continuously makes efforts to achieve equity in health and health care, encourages inter-sectoral collaboration and community participation and provides basic health services to all.

**Primary Health Care (PHC) in Malaysia**

PHC was a core policy for the World Health Organization with the Alma Ata Declaration in 1978 and the ‘Health-for-All by the Year 2000’ Programme (WHO, 1979). The commitment to global
improvements in health, especially for the most disadvantaged populations, was renewed in 1998 by the World Health Assembly. Since the programme has not been shown achieving its target, especially in the underdeveloped countries, the commitment to PHC development has been restated. This led to the ‘Health-for-All in the Twenty-first Century’ policy and programme.

PHC is the “first” level of contact between an individual and the health system. It provides essential health care services and is closest to the people. A majority of prevailing health problems can be satisfactorily managed by this approach. Most services are normally provided by the health centres or clinics. A priority of health care providers has been the enhancement of health of the ‘disadvantaged’ rural communities particularly the rural poor, women, infants, children and the disabled.

The Ministry of Health is the main health care provider for rural communities with its extensive network of health facilities, mobile teams, the flying doctor service and the village health promoters. The primary health care approach is the most appropriate strategy to provide health services in the rural and remote areas. According to WHO, primary health care is an essential health care based on practical, scientifically-sound and socially-acceptable methods and technology made universally-accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development, in the spirit of self-reliance and self-determination (WHO, 1979). It addresses the main health problems in the community, providing preventive, promotive, curative and rehabilitative services. The main elements of PHC are proper nutrition, supply of safe water and basic sanitation, maternal and child health/family planning, immunisation, prevention and control of endemic diseases, health education and appropriate treatment for common diseases and injuries.

Malaysia has been very successful in applying PHC in its health care system. Up to 1970, health care services were provided through a three-tier system. The lowest tier was midwife house and clinic, which served a 2,000 population, followed by sub-health centre and main health centre serving a 10,000
population. The system was converted to a two-tier system to improve the quality of service and coverage, of which the lowest tier (klinik desa) will serve a 5,000 population and health centre (later changed to health clinic) that served between 15,000 to 20,000 population. NHMS II showed that 88.5% of the population lives within 5 km of the health facilities (MOH, 1998). However, only 67% of the rural population in Sabah and 50% of Sarawak is within 5 km to the nearest facility. Sabah and Sarawak suffer from low densities in rural populations, which pose a geographical disadvantage in access to health services. For population with less physical access, outreach services such as a mobile clinics and flying doctor service were provided by the Ministry of Health.

The scope of services has been expanded further to include more than eight basic essential services. These include low-risk birthing centre, radiology service, rehabilitation rooms and equipment for the elderly, disabled and children with special needs, and counselling rooms for adolescents. The expansion of scope requires larger space and buildings and highly-skilled manpower. Family medicine specialists were later introduced to run the health clinics with ambulatory services and expanded scope of services. In the new approach, Malaysia has embarked on PHC based on the six principles of the Ljubljiana charter, which placed emphasis on an approach that is value-driven, (dignity, equity, solidarity and ethics), protects and promotes health centred on people but allowing self-reliance, focusing on quality sustainable finances and allowing universal coverage and equitable access (WHO, 1999).

PHC in the long-term can reduce the cost of health services. This is because it becomes a gatekeeper to the person’s health needs. Services will be provided near to the patient’s home and only the patient in serious condition will require hospital intervention. The shift of inpatient care to ambulatory care would save the cost of services by the government. Currently, the proportion of private sector expenditure has increased from 24% in 1985 to 54.8% in 2008. Most of these services are given by independently-organised clinics and hospitals in densely-populated areas. Greater public-private sector integration in health care is needed and efforts should be made to optimise the use of resources (Lai, 2009).
Challenges in Providing PHC Services

In Malaysia, the workload of health professional in PHC is very heavy. They have to make 40 to 50 million contacts per year. Currently, human resources in health are limited with only 1250 medical doctors and 146 family medicine specialists providing PHC services for the whole country. Introduction of additional activities, programmes or services with limited supplies, equipment and space further increase the burden of the existing services. The consumers of health services are more educated now and they have high expectations of the PHC. They demand better service, beyond the government affordability. Changing lifestyles of the people that lead to different disease patterns have significant impacts on the cost of care. More people suffer from chronic problems such as hypertension and diabetes mellitus that require long-term treatment and care.

Demographic transition toward ageing populations has changed the scenario of services. More ageing populations, especially pensioners, live in rural areas and depend heavily on subsidised care. They require rehabilitative services and community nursing. Medical technologies advance and demand for better services leading to changes in the equipment at PHC centres. This will require specially-trained and skilled workforce, that is scarce now due to lack of interest of the young people to settle or remain in rural areas. The digital divide (rural urban differences in ICT) is a real phenomenon. Apart from the lack of ICT infrastructure, lack of trained manpower to run the ICT-based programmes in the rural and remote areas is a great challenge. Maintenance of ICT equipment is an issue especially when the accessibility is difficult and very costly. Globalisation does help to reduce the lack of manpower especially rural physicians to run the remote health centres. However, difference in culture and language is a main barrier in the smooth-running of the service.
Issues of Recruitment, Retention of Medical Officers in Rural Areas

In most developing countries, inequalities in the geographic distribution of doctors and other health providers have not been fully addressed (Rosenthal M. B. et al., 2005). Even in developed countries, there are acute shortages of doctors who are willing to serve in rural areas. Therefore, it is quite a universal phenomenon that there always a lack in the number of family physician in rural and underserved areas (including islands). One of the main reasons for the phenomenon is the changing trends in specialisation and the decline of family medicine. The specialty has been seen an inferior specialty and not wealth accumulating. Not all countries have policies to solve this inequality and misperception.

How is the recruitment issues addressed in some countries? Training of doctors based on region and local needs such as selection of medical students from the areas where they are going to serve after graduation, is able to increase the number of doctors in rural areas. Providing incentives such as better remuneration and facilities (medical and social) for doctors and families help in some places (Kay D., 2006; Buykx P. et al., 2010). It is an uphill task to encourage doctors to pursue general practice as a career. However, it is successful in some countries with special programmes. Finally, yet importantly, a short-term measure is to employ foreign medical graduates, especially from poor countries to serve the rural areas (Parsi K., 2008). However, this will not solve the issue of inequality between countries.

Training of Medical Graduates

Rural students are under-represented when compared to rural population demographics. For example 22.4% of Canadian population are rural, however only 10.8% of medical students in Canada were from rural areas (Shack and Baker, 1999; Miedema et al., 2009). Most of them are more likely to be from the higher socioeconomic status and more likely to choose metropolitan areas to practise upon graduation. However, in many studies, it was quite
consistent that rural students are more likely to return to rural practice (Brooks R. G. et al. 2002). Students from University of Newcastle in Australia, who lived in rural areas, were 2.54 times more likely to be working in rural areas compared with those who had lived in urban areas (Lavenn G. A. et al., 2003). Among US medical students with rural backgrounds and interests in family medicine, 23.7% entered rural family medicine programmes (Rabinowitz H. K., 1988). Learning in the rural family practice setting is a necessity to be able to perform effectively as rural physicians, such as rural training tracks during family medicine residency training, training at district or regional hospitals in various specialty areas related to rural practice or experience in small-hospital medicine, including obstetrics, emergency care, anaesthesia and surgery.

**Continuous Professional Development (CPD)**

Rural physicians and professionals must have access to CME/CPD programmes especially held in towns or urban centres (McLean R., 2006). Greater emphasise should be placed on practice-related to rural medicine. Funding initiatives should be allocated for CPD for rural doctors to attend CPD events or to organise one in their place. As far as possible, professional isolation should be minimised to retain doctors in rural areas. ICT with broadband facilities will become enablers for distance education for doctors in rural areas and telehealth initiatives will provide opportunities for consultation with peers elsewhere.

**Country’s Experience**

Currently, USA has rural health policies regarding the recruitment and retention of rural physicians (Spire M., 2000). Less than 11% of the nation’s physicians practises in non-metropolitan areas that comprise more than 20% of the nation’s population. Around 3000 communities are considered underserved by primary health care. Programmes aimed at recruitment of PHC physician include the National Health Service Corps. (NHSC), Interdisciplinary Rural
Training Grants (ITG), Health Professions Education Programme (HPEP), Area Health Education Centre (AHEC) and the Rural Recruitment and Retention Network (RRRN).

Australia, on the other hand, increased the number of students with rural backgrounds or with rural connections to increase the number of rural physicians (Mohamed Khadra, 2001; Wearne S. M. and Wakerman J., 2004; Dunbabin et al., 2006). There are special entry criteria for rural students. Their trainings are in special rural medical schools located in rural settings, rural doctors are appointed as the adjunct academic staff and partnerships between rural health facilities and urban medical centres through ICT and broadband facilities are developed. Efforts have also been undertaken to increase the number of doctors in rural and remote areas through relocation of doctors from oversupplied areas. It is a difficult task since rural areas could not offer better opportunities for them to stay longer, such as postgraduate education, education for children and means of resolving family social conflicts. Some effective strategies that have been implemented include locum relief, flexible delivery of CPD, skill training, improved housing and better educational support for families.

In Malaysia, most doctors have to spend a minimum of two years in rural areas (health clinics) or district hospitals as a part of their compulsory service (three years). Retention is still an issue since not many facilities are available in the districts, in term of post graduate education and CPD, family recreation and “good” children educational support, spouse career opportunities and social network. Frequent change of doctors in rural areas causes a disruption in continuous and constant leadership support. No special privilege is occurred to minorities or regions in admission to most medical schools. All admissions are controlled by a central body or the Ministry of Higher Education to maintain standards and this is based on merit. All medical schools incorporate training in community health in their curricula. The content and depth vary according to the location and mission of the school.
Barriers

In most countries, including developing ones, rural students are less likely than urban students to apply for admission to university and/or medical schools on account of their lower academic performance compared to urban students (Mick Bennet and Wakeford R., 1983). They also believe that doctors should be randomly selected for general practice or provision of primary care. Career of the doctors should be determined by the doctors themselves since most of them are self-funded or on study-loan. Since rural students may require special entry to medical programmes, many universities are reluctant to entertain non-academic admission criteria and traditional admission procedures do care for disadvantaged groups.

Policy on Training for Rural Practice (WONCA)

World Organisation of National Colleges and Academics (WONCA) as the main party promoting rural practice, has proposed a policy to enhance the recruitment and retention of doctors in rural areas (WONCA Working Party on Training for Rural Practice, 1996). The policy includes nine major initiatives that include:

- Increase the number of medical students recruited from rural areas through introduction of programmes promoting medicine as a career to rural secondary school students; establish scholarships and educational support programmes that identify medical students in rural areas, devise selection processes that encourage admission of students from rural areas. The other suggestions include providing substantial exposure to rural practice in medical undergraduate curricula, and including specific, flexible, integrated, coordinated rural vocational training programme.
- Provide specific, tailored, CPD programme that meets the identified needs of rural family physicians.
Create appropriate academic positions and provide CPD and financial support for rural physicians to encourage rural health research and education.

Medical schools should educate doctors to meet the needs of their geographic region.

Development of appropriate needs-based and culturally-sensitive rural health care resources, with local community involvement, regional authority cooperation and government support.

Improve professional, personal and family support in rural practice to promote retention of rural doctors.

Development and implementation of national rural health strategies with central government support.

WONCA policy on recruitment and retention of rural health practitioners is an excellent guide for many countries to adopt. Steps that have been taken or could be taken to enhance the policy include making educational choices early; hence recruitment efforts must be directed at high school students. Early recruitment needs to be supported by targeted funding (scholarships or educational loans). Medical schools must admit students from their region with clear public criteria and the composition of admissions committees should include public representatives. Medical schools must involve rural communities in rural medical education and must offer rural health training and CPD to health providers and preceptors. Universities must make sure that rural exposure will be provided in the curriculum and co-curriculum. Students in rural settings need good-learning facilities and extensive programmes for soft-skill development. Effort should be made by the university to get fair recognition and accreditation of rural health programmes. Medical schools should also offer clinical services to the community to strengthen ties and elevate their health status.

Health Transformation in New Economic Model

Health care and social services play pivotal roles in rural development. Health care should not be provided in isolation to
other social services such as welfare services, food aids, housing or employment. Aspiration of the Government to elevate the economic status of the Malaysian population and achieve a high income country by 2020 should serve as a guide for transformation in all sectors. Private sector innovations such as health insurance and ICT-based clinical services should be supported. The creation of an innovative society using broadband facilities will be encouraged to supplement government efforts to achieve health transformation and service goals. Malaysians of all races should contribute in these innovative strategies, which include:

**Integrated Services**

Some of the services can be integrated to save time and manpower, especially in the smallest and most remote areas where there is insufficient critical mass to sustain basic services. This is becoming a trend in most developed countries where only a small proportion of population inhabited rural areas. In many areas, a one-stop centre can become a centre for these integrated services. The other alternative is the use of home-based care and/or self-management programmes. In this instance, ICT is a very important tool used to deliver distant-health promotions and health problem management.

**Paraprofessional as Alternative**

It is also critical to have greater flexibility in traditionally-professional roles and responsibilities (i.e. nurses or medical assistants managing common conditions and greater reliance on community health workers or paraprofessionals) since doctors are not easily available or retained in these areas. Malaysia is blessed with this practice ever since independence, especially in Sabah and Sarawak, where there is obvious shortage of doctors in rural areas. However, effort should be made to increase the number of medical officers and rural physician in these areas to meet the demand of the people for better and quality services. The creation of 1Malaysia clinics is a good example of strategy to improve coverage, affordability and health services in urban as well as rural areas.
Community Participation and Empowerment

Every citizen should be involved in any government effort to improve the quality of life. The people should be involved in the campaign to promote healthy lifestyles through embarking on disease-prevention activities, embrace a positive lifestyle and subject to screening for disease from time to time. With the presence of fast communication via broadband and the internet, people can acquire knowledge and skills quickly and then be able to make their own decisions in seeking medical attention. They need to be empowered to perform activities that would keep them away from risks injury and disease.

They also need to identify people in the area, especially the young, to be trained to become future health workers such as doctors, physician assistants, nurses, health inspectors and ICT operators, based on their academic backgrounds. It is more likely that people from this area will return after their studies to serve their own place and communities. Leaders from the community should form voluntary organisations and organise self-development activities under the guidance of health providers such as MOH, NGOs and universities. Universities are no longer viewed as ivory tower that only convey knowledge to students but are also responsible for guiding the community around them the way forward in health care delivery.

Financial Reform

Currently, funding of public sector PHC is based on financial performance in the previous year, while private sector funding is through fee for service (out of pocket payment, health maintenance organisation or insurance). In financial reform, a new financing structure should be introduced to enable the health delivery system to provide quality health care, universal coverage based on solidarity and equity. MOH through its Family Health Development Division is proposing the lCare model that considers the family physician as a first access to the system (primary health care provider) (Safurah, 2009). This physicians or group of physician will be assigned to a designated registered-population and will be paid by the National Health Financing Authority through capitation. The
patient will get access to all levels of care due to clinical integration between primary, secondary and tertiary care. The advantages of this system include people’s access to both public and private health care providers, low payment at the point of seeking care, care nearer to home, increased quality of care, personalised care, better health outcomes and reduced gap between remuneration and workload amongst health workers in the public and private sectors. It also helps the nation to strengthen national unity, address equity and access to care especially for lower and middle income groups, contain the rapid increase in health care cost, stimulate the health care market, capitalise on liberalisation and reduce dependence on the government. In the long run, health care expenditure will be reduced through the quality of care provided by primary health care providers. The burden of disease will be lower because of aggressive health promotion activities, and also the screening for chronic diseases such as obesity, hypertension and diabetes mellitus. Admission of medical technology to the system will be overseen by MOH in order to reduce the cost of treatment and overall health care cost. A similar system has been implemented in many developed countries and proved to be effective in maintaining the health status of their respective populations and reducing the dependency of people on government-subsidised care (Ham C., 2005; Minnesota Department of Human Services, 2008; Centre for Health Transformation, 2010).

Modernisation of Education to Create a World-class Workforce

Workforce with first-class mentality is required to facilitate the process of transformation in a fully-competitive economic environment. In the new economic model, the nation requires innovative and creative manpower to be able to produce ideas, products and services that can be commercialised to generate income for the country. In health, it is expected that the workforce not only can provide excellent health services to the community but is also expected to innovate new methods, procedures, approaches or products to improve the work and services. How can we develop such a workforce? The training should start from the young. At school, they must acquire the skill and behaviour of
knowledge-seeking, multi-lingual communication skills, team work, good moral or religious values and innovation. These will be further strengthened at the university level, so that at the end of the course, the graduates that we produce is knowledgeable and competent in their fields, possess high cognitive skills, be innovative, and be able to communicate effectively in different languages as well as be able to contribute to the well-being of the society (MOHE, 2007).

**ICT as an Enabler for Health Transformation**

Health information systems are still fragmented in Malaysia. There is many data overlapping between the departments and agencies. It is quite common that patient records can be located at the point of care. The Ministry of Health (MOH) has taken steps to transform the health system using ICT as an enabler so that services provided will be accessible, integrated, be of high quality and affordable. The Telehealth project was introduced with four components that provide up-to-date online health knowledge, health plan (HP), Continuous Professional Development (CPD) and initiate teleconsultations to enhance the capabilities of PHC centres to seek consultation from the major specialist hospitals in the cities (Amiruddin Hissan, 2006).

**PRIMARY HEALTH CARE IN SABAH**

Although many less developed countries have not achieved the target of PHC, Malaysia has reached the target of health-for-all by the year 2000. This evidenced the continued commitment of the government to improve the lives of people across the country, whether from urban, rural or remote areas.

**Demographic Profiles and Health Status**

Sabah was under the Brunei Sultanate in 16th century, and then under the Sulu Sultanate since 1658. It was given to British North
Borneo in 1882. It was later occupied by the Japanese (1941 – 1945). Following the end of World War 2, Sabah was again governed by the British until 1963 when it joined the Federation of Malay States to become Malaysia. The total area of Sabah is 76,115 km² with a total population about 3.5 million and density of 32.2/km². The composition of ethnic groups is Kadazandusun 17.8%, Bajau 13.4%, Malay 11.5%, Murut 3.3%, other Bumiputera 14.6%, Chinese 9.6%, other non-bumiputera: 4.8% and non-Malaysians 25%. Sabah has one of the highest population growth rates in the country (eMas, 2010). The growth rate between 1980 and 1991 was 5.67%, 1991 and 2000 was 3.83% and now around 4.5%.

The main factors affecting the health of the rural people in Sabah is poverty and accessibility. Sabah still lags behind other states in terms of economic growth and per capita income. It is the third poorest state in Malaysia. Currently 16% of Sabah households had income below the poverty line. In terms of household’s access to basic utilities and services; 47% have accessible to electricity, 20% to piped water, 85% to educational facilities and 35% to health care (Yusof, 2009). Sabah is a big state, second to Sarawak, in terms of land area. Some areas are still inaccessible by road. The only communication is by river, which is dependent on weather condition and season.

The health status of the people of Sabah as a whole is equivalent to the population in Peninsular Malaysia. This is reflected by the decline in death rates of infant (IMR), children (TMR) and mothers (MMR) in Sabah in line with the mortality rates in the West Malaysia. This shows that Sabah has achieved an excellent health status in a period of not more than 50 years (Marzuki, 2009). With the exception of malaria and tuberculosis, most of the communicable diseases have been under control. The existence of drug-resistant tuberculosis and malaria have affected the effectiveness of the control programmes. Lifestyle-related diseases have increased in Sabah but their incidence is still low as compared to other states in Malaysia (Table 4, NHMS III, 2008).
**Table 4** Sabah vs. W. Malaysia average differences in health conditions (NHM III)

<table>
<thead>
<tr>
<th>Health conditions / utilisation</th>
<th>Sabah (%)</th>
<th>Malaysia (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Acute respiratory tract infection (ARI)*</td>
<td>14.9</td>
<td>18.2</td>
</tr>
<tr>
<td>2 Acute diarrhoeal illness (ADI)</td>
<td>4.5</td>
<td>5.0</td>
</tr>
<tr>
<td>3 Recent illnesses/ injuries</td>
<td>26.3</td>
<td>23.6</td>
</tr>
<tr>
<td>4 Physical inactivity</td>
<td>42.5</td>
<td>43.7</td>
</tr>
<tr>
<td>5 Smoking (&lt;18 year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- ever smoker</td>
<td>18.5</td>
<td>14.7</td>
</tr>
<tr>
<td>- current smoker</td>
<td>11.0</td>
<td>8.7</td>
</tr>
<tr>
<td>- establish smoker</td>
<td>4.1</td>
<td>3.3</td>
</tr>
<tr>
<td>- experimental smoker</td>
<td>1.9</td>
<td>1.1</td>
</tr>
<tr>
<td>- passive smoker</td>
<td>28.2</td>
<td>26.8</td>
</tr>
<tr>
<td>Smoking (≥ 18 year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- ever smoker</td>
<td>33.6</td>
<td>27.0</td>
</tr>
<tr>
<td>- current smoker</td>
<td>27.0</td>
<td>21.5</td>
</tr>
<tr>
<td>- passive smoker</td>
<td>19.8</td>
<td>21.5</td>
</tr>
<tr>
<td>6 Alcohol intake (≥18 years old)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- ever consume</td>
<td>24.2</td>
<td>16.2</td>
</tr>
<tr>
<td>- current drinker</td>
<td>12.1</td>
<td>8.5</td>
</tr>
<tr>
<td>7 Diabetes mellitus*</td>
<td>4.9</td>
<td>14.9</td>
</tr>
<tr>
<td>8 Psychiatric illnesses (≥ 16 years old)</td>
<td>7.9</td>
<td>11.2</td>
</tr>
<tr>
<td>9 Malnutrition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- underweight among adults</td>
<td>10.6</td>
<td>8.5</td>
</tr>
<tr>
<td>- underweight among children (&lt;18 years old)</td>
<td>19.1</td>
<td>13.2</td>
</tr>
<tr>
<td>- stunting (&lt;18 years old)</td>
<td>26.9</td>
<td>15.8</td>
</tr>
<tr>
<td>10 Health seeking behaviour for recent illness</td>
<td></td>
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<td>11 Women’s health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- breast examination (all methods)</td>
<td>48.9</td>
<td>57.1</td>
</tr>
<tr>
<td>- pap smear examination</td>
<td>35.3</td>
<td>43.7</td>
</tr>
</tbody>
</table>

*significant difference

**Rural Health Services in Sabah**

Rural health services in Sabah are provided through 11 Health Offices, 80 Health Clinics, 19 Maternal and Child Health Clinics and 190 Rural Clinics. A total of 687 doctors rendered health services...
in Sabah, with a doctor to population ratio is 1:4,362. This ratio is still very high compared to 1:1,200 in most of the other states in Peninsular Malaysia. The nurse to population ratio is 1:564 whilst community nurse to population ratio is 1:1,458 which is also considered very high compared to 1:200 in many other states. Sabah is blessed with dedicated manpower that is willing to serve the community wherever they are no matter how difficult it might be.

Health Care Delivery Challenges in Sabah

Many issues plague health care delivery in Sabah. Inaccessibility is an issue in remote rural populations of which around 23.7% live more than 5 km from static health facilities. Not all services will be available at the remote health centres. So inequities exist between rural and remote rural centres. The pattern of disease is also different between urban and rural areas (NHMS III, 2008). More incidence of injury, hypertension, psychiatric morbidity and acute respiratory infection was found in rural areas. The issue of bypassing PHC to get better services in major hospital and private facilities is quite common in many areas for reasons related to distance, waiting time, availability of specialised doctors and appropriateness of treatment. Other than that, maternal death is still quite common in Sabah, especially among foreigners. Most of the death is related to postpartum haemorrhage (25.9%) and no antenatal check up (44.6%).

RESEARCH IN RURAL HEALTH

The Government has invested heavily in research and development under the Ninth Malaysia Plan (9MP), with an allocation of RM90 million to MOH and additional grants allocated to universities as well as for biotechnology. Malaysia’s wealth in biodiversity should yield medicinal and therapeutic benefits that would place the nation at the forefront of drug discovery and development. Research in rural health should be conducted with a view to improve the health status and quality of life of rural population...
Research may improve health by producing better health intervention programmes, providing evidence for decision-making and policy development, providing motivating factors for people to change their behaviour and empowering the people. Health systems research and operational research are the excellent tools for providing data and evidence for health improvement. However the 10/90 divide still exists between the rural and urban, as well as the developing and developed regions in terms of the most appropriate use of resources.

Research Priorities

In the area of rural health, there are still many research questions that have not been addressed by researchers especially in Sabah. Among the research issues that need further examination are:

- What are the main factors contributing to inequitable care?
- To what extent is rural health impacted by poverty?
- Can telemedicine provide health for all? How can it be used to educate the rural populations in the control of malaria and tuberculosis?
- How to narrow the health care gap among rural populations?
- How to recruit and retain skilled health care providers?
- How does nutritional status (especially nutrient deficiency) impact rural health?
- What are the factors associated with the health of agricultural workers? How can we improve and sustain their livelihood?
- Why is there still a significant threat from communicable-diseases such as malaria and tuberculosis despite good care and health programmes?
- What are the traditional practices and medicines that can be promoted for use during emergencies in rural or remote areas?
- What are the natural products or herbs that can be identified in rural populations to be used in drug discovery?
Although there are still many questions that need to be answered urgently, there will always be issues related to the funding of the research. Epidemiological research has been given low priority in Malaysia compared to clinical or biotechnological research. Difficulty in seeking local funding for rural health research may hinder the progress and development of the discipline. It will result in slow improvement of the health status and community empowerment in rural areas. More funding either from local or international funding source should be allocated to support research in rural areas, to narrow the gap of 10/90 and to achieve equity and MDG goals.

**RURAL MEDICAL EDUCATION**

The needs for medical practitioners in implementing health-for-all for the community cannot be underestimated. The university, Universiti Malaysia Sabah, should play a role to assist the other health care providers in disseminating essential knowledge and education to empower the community, in order to empower them for protecting their health and optimising wellness (Figure 2). The university should conduct medical education programmes that are tailored to meet the needs of the community.

**HEALTH FOR ALL**

![Diagram](image.png)

*Figure 2* Coordinating changes towards Health for All
As quoted from William Richardson (Richardson, 2001), the W.K. Kellogg Foundation chairman:

"Universities can, and must play a role in combating the problems that plague our communities, from poverty to crime, to racism and more."

It denotes the importance of the university in serving the community in their vicinities. It is the university’s social responsibility to upgrade the health and socioeconomic status of the community around them through community-engaged teaching, research and services (Figure 3).

**Figure 3** Community-engaged teaching, research and service

Health Partners

To be able to function effectively, universities cannot work in isolation. They have to establish a smart partnerships between all stakeholders
in the community such as policy makers, health managers, health professionals and the community (Figure 4). The partners should respect each other, understand their roles, and work as a team. This will create the unity required for the health phenomenon (The Network: TUFH, 2006), the ultimate aim for interprofessional and intersectoral collaboration. It is acknowledged that health professionals have never been entirely successful at working together. Conflict does not only happen between professions such as physicians, pharmacists, nurses and laboratory technologists, but also within the medicinal fraternity. There are unequal opportunities and lack of respect between specialists such as cardiologists, neurologists, internists and public health specialists. Understanding the role of each health professional, the contribution of team efforts to improve individual and public health, and the changing desires of health professionals in relation to their work and life goals, are the important issues that need to be considered as everybody works towards innovative and sustainable solutions for the future.

**Figure 4** Pentagram of health partners or stakeholders in health care

**Roles of the University in Rural Health**

The way in which medical students are educated has changed dramatically in the past 20 years. Currently, students are taught on
how to learn medicine actively, participatory and preparatory for lifelong learning. Even the places where students are trained have changed. More medical schools have now have placed their students in general practice clinics, district hospitals, community health care settings and even private hospitals. In terms of contents, emphasis is given on new developments in medicine such as molecular medicine and genetic, ethics, evidence-based medicine, safety and quality issues in health care. The main aim of the programme remains the same, that is, to produce doctors who are safe and competent to practise as junior doctors in any setting and prepared to pursue further training in the specialty areas. Graduates should acquire a set of professional values and attitudes that would enable them to be open to feedback through peer review and to accept the increasing need for accountability to the wider community.

In the past, medical education used to be regarded as a domain of the universities. Since human resource in health care is affected by economic situation, population growth and policy change, the Government and the other stakeholders have an obligation to control the number and the quality of medical professionals produced. The maldistribution of medical practitioners, especially doctors, requires the Government’s intervention so that disparities and inequalities in health care can be minimised. Countries both developed or developing, still facing real shortages of physicians in rural and remote areas. The main reasons for the shortages are lack of interest among physicians to work in rural areas, lack of medical and common facilities, and poor reimbursement and fringe benefits. Most of the physicians also are not attuned to the environment in which they worked (Wearne and Wakerman, 2004; Pearce et al., 2007).

Universities have a role to train medical practitioners who are comfortable with their environment. A sensible approach will be to select local students and provide special training to keep their interest in rural health and community development. Emphasis should be placed on prevention of diseases. Since diseases are no longer the domain of a doctor but that of multidisciplinary team, we need to change the method of training of medical students to reflect the changes in care management. Doctors should change their attitudes
and align themselves and be more open to teamwork and unity for health. Interdisciplinary practice and education should be encouraged in all universities to facilitate changes in the delivery of services (Walker et al., 2003). Future doctors also have to be better communicators since they will be more involved in health education and health promotion to a larger extent.

UMS School of Medicine: Role Model for Rural Medical Education

Have we really examined our students on values and characteristics expected of the profession such as respectful, altruistic, ethically sound practices and sensitive to culture, age, inequality of health care and disability? UMS School of Medicine has been propagating the ideal values expected by the profession and has practised what it preaches, that is the principle that “prevention is better than cure”, as stated in the mission and vision of the school.

Vision

The School of Medicine at Universiti Malaysia Sabah, aspires to become the centre of excellence in learning and research in the field of medicine both locally and internationally. The School will strive to produce medical graduates of high calibre, possessing ethical and moral values, as well as embracing a liberal, independent and global outlook. They must portray a readiness to offer professional service towards enhancing the quality of life anywhere.

Mission

To impart and inculcate medical education of high quality with emphasis on universal values such as ethics, morality, care and concern as well as teamwork, at both undergraduate and postgraduate levels. These values will enable the UMS medical graduates to act prudently in providing appropriate leadership to promote the health of the communities, thus empowering them to be in control with their own health and well-being.
Doctors trained in UMS should know their rights, those are:

- Provide appropriate care for the patient.
- Practise medicine according to conscience and conviction.
- Good working conditions to provide the best care.
- Lobby for good health care delivery systems.

Medical training at UMS will follow the educational domain adopted by Ministry of Higher Education (MOHE). It comprises the hard and soft skills required by medical students to become safe and competent medical doctors. In most schools of medicine around the world, the strategies of education programmes follow the SPICES model (Harden et al., 1984):

- Student-oriented
- Problem-based
- Integrated
- Community-oriented
- Electives
- Spiral and systematic

However, the UMS School of Medicine has adopted slightly innovative expanded model:

- Student oriented
- Problem-based
- Integrated
- Community-oriented
- Electives
- Spiral and systematic
- Modular / block
- Organ-based
- Volunteerism
- Evidence-based
- Relevant context
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- Volunteerism
- Evidence-based
- Relevant context
The Strategies in Greater Depth

Student Oriented

"Give a man a fish, you feed him for a day, teach a man to fish, you feed him for life" (Chinese proverb). It is an important strategy to develop the attitude and skills for learning medicine. Students should become independent learners, willing to discover new frontiers of knowledge and learning on their own. The teacher will be a facilitator of learning who gives direction and advice on how and where to obtain information and help them interpret and make use of it. Learning methods such as problem-based learning (PBL), seminars, small group discussions (SGD), role-play, debate and drama have proven effective in inculcating self-reliance and independence among medical students. Good educational resources such as medical library, clinical skills laboratories and discussion rooms are important to support these educational strategies.

Integrated Learning

Integration is defined as making connections within a major, between fields, between curricula, co-curricula, or between academic knowledge and practice. In most medical schools, an integrated curriculum refers to a non-compartmentalised approach to basic science learning. The content of basic science will be no more discipline-based such as anatomy, physiology or biochemistry, but it is possible to have combinations of these disciplines in an integrated manner (horizontal integration). However, in the more extreme form of integration, some medical schools have introduced vertical integration in which clinical skills and practices are introduced at the early phase of the programme or during the preclinical stage. In this case, knowledge from multiple sources and experiences are connected while skills and practices are applied in various settings at different stages of the programme.
Evidence-based Medicine (EBM) is defined as the integration of best research evidence with clinical expertise and patient values (Sackett et al., 1996). It is the backbone of decision-making in healthcare. Evidence-based medicine is a systematic approach to clinical practice that emphasizes the use of evidence from research to inform patient care decisions. It is based on the principles of evidence synthesis, meta-analysis, and systematic reviews, which provide a rigorous and objective framework for evaluating the effectiveness of medical interventions.

Evidence-based medicine requires practitioners to critically evaluate the literature and apply it to clinical practice. This involves the use of evidence-based guidelines and decision-making tools to guide clinical practice. It also requires practitioners to be able to critically appraise the quality of evidence, and to be able to interpret and apply the results of research in a practical and effective manner.

Volunteerism is the willingness of people to work on behalf of others without being motivated by financial or material gain (Wikipedia, 2010). It is always on an impromptu basis, recognizing a need and fulfilling it especially during emergencies such as disaster and war. Volunteerism is the willingness of people to work on behalf of others without being motivated by financial or material gain (Wikipedia, 2010). It is always on an impromptu basis, recognizing a need and fulfilling it especially during emergencies such as disaster and war.

Rural Medical Practitioners

Liberation, materialism, and consumerism have increased litigation against many professionals especially in the medical field. However, altruistic behavior is declining in many professions due to personal interest. The benefits of recognition and need have decreased. However, altruistic behavior must be encouraged to help others when we need it. Altruism focuses on a selfless concern for the welfare of others. It is a traditional virtue in many cultures, and a core aspect of various religious traditions such as Islam, Christianity, Hinduism, Buddhism, Confucianism, Judaism, and many others (Wikipedia, 2010). Altruism is selfless concern for the welfare of others. It is always on an impromptu basis, recognizing a need and fulfilling it especially during emergencies such as disaster and war. It may be done for altruistic reasons, for example charity, community fulfillment or a sense of duty to others. Volunteering is the willingness of people to work on behalf of others without being motivated by financial or material gain (Wikipedia, 2010). It is always on an impromptu basis, recognizing a need and fulfilling it especially during emergencies such as disaster and war.

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and circumstances. Rural doctors provide these wide ranges of services with limited and/or remote access to specialists or allied health services and resources. Independence, self-reliance, multi-skilled, strong leadership and team-building qualities (Humpreys, 1998; WONCA Working Party on Rural Practice, 2001; Mungali, 2004) often characterise their personal aptitude.

Rural and remote medicine is the body of scientific knowledge underpinning clinical practice and medical service delivery in the rural and remote context (Murdoch, 2007). Its aim is to achieve the best possible outcomes in health care in rural areas. The skills set for rural and remote medicine include the competencies required in general practice and community health. The practitioners are able to treat common communicable and non-communicable diseases in the community and have skills to prevent these disease from occurring.

**Agricultural Medicine**

In many underdeveloped and developing countries, agriculture is still a major economic activity in rural and remote areas (Wikipedia, 2010). It is a subspecialty of rural health and related closely to occupational and environmental health. There is a need for a medical practitioner to has skills in treatment and prevention of agriculture-related health problems, diseases and injuries such as long-term exposure to pesticides, noise, vibration, sun, dust, chemicals in the farms, agricultural tools and machineries, and animals and zoonotic diseases. The doctors working in this area should be able to detect diseases early through periodic health screening and giving prompt treatment to those who are at risk or sick. An intensive and persistent health education programme is required to prevent recurrence of diseases.

**How Should Students be Trained in Rural Medicine?**

Such students should be trained like any other general practitioners, using the most modern methods of teaching. They must have sufficient exposure in basic and clinical medicine to be a competent and safe doctor. However, to be able to function effectively in the
rural setting, students should be exposed to the rural community very early in their studies. In Canada and Australia, schools have diversified their teaching according to the need of the population where the graduates are going to serve (Rural Health Workforce Australia, 2008). For example, in aborigines population, the students from this community are selected and trained in the universities. During the clinical phase of the study, these students will be posted to the rural areas similar to their places of origin. After graduation, these doctors will continue serving their community. This programme has solved some of the impinging problems among rural communities in these two countries. How about planting interest in rural medicine among students from urban or equivalent? WONCA has proposed a policy on rural health practice as a guideline for members of the profession around the world, to recruit, train and retain health care providers in rural areas (WONCA Working Party on Rural Practice, 2001; The committee of Deans of Australian Medical Schools and the Australian Medical Councils, 2005). UMS, as a strong proponent of rural health, will adopt the recommendations to provide a long-term and sustainable solution of health care workforce in rural areas.

UMS medical curriculum has given a lot of emphasis on community-based education (Figure 5). The science community is introduced to students from the beginning of the programme through PUPUK programme at the first year and it lasts until the end of their studies (minimum five years). At the end of the first semester break, they will attend two weeks of co-curricula programmes in the interior of Sabah. Public health modules are delivered in the first and second years (eight credit hours). These include basic statistics and epidemiology, as well as basic disease prevention and community surveys. In the fourth year, they are posted for seven weeks in the rural district of Kudat for Community Medicine Posting to study the health care delivery system and make community diagnosis and health promotion in selected areas. They will also undergo a district-hospital-and-family-medicine posting in the Kudat District Hospital and a posting at a general practitioner’s clinic for seven weeks to learn more about delivery of health care of rural communities and the practice of the general practitioners.
RURAL HEALTH THE WAY FORWARD

UMS MEDICAL PROGRAMME STRUCTURE

PUPUK
= 5 years

45

District Hospital Posting – 7-week rotation

Community Medicine Posting – 7 weeks

CBE – 2 weeks

FIGURE 5 Community-based programme in medical curriculum, UMS School of Medicine
Community-based Education (CBE) in Rural Areas: A Case Study

Health Promotion Programme (EC1773)

In an effort to instill interest among new students on rural health, the UMS School of Medicine has introduced a two-week co-curricular module that is conducted during the semester break at the end of first year (Figure 5). Students, groups of 10 are placed in selected rural villages throughout Sabah, under the guidance of an experienced supervisor. They are expected to do a rapid rural appraisal (RRA) to identify the needs of the community and assess their health problems, and then develop health intervention programme to improve the health situation in the area. These include health education programme, cleanliness campaign through “gotong-royong” and health screening. Students are also expected to study the culture, religion and behaviour of the population, to enable them to obtain full cooperation and participation of people in health promotion effectively. At the end of the programme, students are expected to present their findings to the community and at the farewell event. Based on feedback, the programme has been an exhilarating experience for them and has been able to stimulate interest in rural medicine. Some of the case studies are presented in the Table 5.

Community Medicine Posting

The community medicine posting will train students to study the district health care delivery system and develop skills to identify community problems and implement a planned health promotion programme in selected villages. They use the basic knowledge given to them in the early years of their study and the knowledge in real situations develop the skills to communicate and have their leadership skills.
**Table 5** Case studies: Community-based education programmes in rural and remote Sabah (2010)

<table>
<thead>
<tr>
<th>No</th>
<th>Case studies (village)</th>
<th>Lesson learned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kampung Rampayan Laut, Kota Belud – small village with 120 houses of mainly Bajau community and fishermen.</td>
<td>Major health issues identified were personal hygiene and sanitation. A series of health promotion activities were carried out to increase the awareness and the knowledge of the community.</td>
</tr>
<tr>
<td>2</td>
<td>Kampung Pelakat, Sipitang – a village comprised of 179 houses and 850 villagers of mainly Kedayan, and Brunei communities.</td>
<td>The group identified health problems such as smoking, gout and hypertension. Health talks, exhibition and medical check-up were conducted. They also involved in “gotong-royong“ to clear clogged drain to prevent from mosquitoes breeding and improve sanitation.</td>
</tr>
<tr>
<td>3</td>
<td>Kampung Matupang, Ranau – a village inhabited by 500 people mainly Dusun community and farmers.</td>
<td>The students identified hypertension, malaria and sanitary hygiene as the main threats to the health of the community in this area. Health education among the schoolchildren had been selected to educate and increase their awareness about the problems.</td>
</tr>
<tr>
<td>4</td>
<td>Kampung Tempios, Ranau – The villagers are mostly Dusun origin and majority are farmers. There are 380 people living in 62 houses.</td>
<td>Health problems faced by this community were lack of clean water supply, poor sanitary latrine and alcoholism. The team had conducted health education talks, exhibition and medical check-up to increase their awareness of the health issues.</td>
</tr>
<tr>
<td>5</td>
<td>Kampung Tanjung Aru, Menumbok – About 640 people live in this village and they are mainly Brunei community and Muslim.</td>
<td>The common health problems faced by the villagers are hypertension, diabetes and gout. Chikungunya fever is endemic in this village. The group had conducted health talks, exhibition and medical check-up to schoolchildren and villagers. They also participated in “gotong-royong“ to improve the environment and destroyed mosquitoes breeding places.</td>
</tr>
<tr>
<td>6</td>
<td>Kampung Sengkabok, Menumbok – A total of 490 people live in this village and mainly Brunei community.</td>
<td>A part from communicable diseases such as malaria, dengue and acute diarrhoeal diseases, people in this area also suffered from chronic medical problems like hypertension and obesity. House-to-house health talk, exhibition and medical screening were the strategies used to promote health in this community.</td>
</tr>
<tr>
<td>7</td>
<td>Kampung Taginambur, Kota Belud – 1000 people live in this village and mainly Dusun community.</td>
<td>The team identified the lack of good water supply and poor sanitation as the main threats to the health of the villagers. The use of clean water and proper disposal of rubbish become their main theme for health education talks and exhibition.</td>
</tr>
<tr>
<td>8</td>
<td>Kampung Luanti, Ranau – There are 250 people in this village. Their main economic activities are paddy planting and tourism.</td>
<td>They identified anaemia, hypertension and malnutrition as the major health problems in this area. Health talks on hypertension and balanced diet were conducted to increase awareness and knowledge among people in this community.</td>
</tr>
</tbody>
</table>
Key Features of the Rural Medical Education

Rural medical education should be conducted where it is most needed, such as Sabah and Sarawak. The main themes for rural medical education includes:

- **Ambulatory care** Training should be provided in ambulatory care sites, which delivers high quality, comprehensive care that is effective, efficient, safe, timely, patient-centred and equitable.

- **Promoting high-quality health care** The presence of medical programmes should never compromise the delivery of high-quality health care. A single standard of care must be provided for all patients regardless of their socioeconomic status.

- **Promoting quality of training and patient care** Improve the practice environment to attract and retain physicians. They should be reimbursed based on the time commitment to provide primary care services.

- **Physician supply** Physicians should be encouraged to practise in underserved rural communities through better incentives and fringe benefits so that they can be involved in teaching and training medical students.

- **Research** Invest in the rural medical research infrastructure to support biomedical and clinical research that will attract researchers, collaborators and the biomedical industry.

- **Community involvement** Communities should support the programme and participate actively in the delivery of care either in the ambulatory centre or in the community itself.

Inter-Professional Education (IPE)

Rural health services have been affected by inadequacies in service delivery, inadequate resources, demand for more user-centred healthcare, and changes in management practices. One way to
solve these issues is by having more unified health force at this level. Doctors are the most difficult personnel to work in teams. IPE can be a measure to develop more congenial group of healthcare staff in the rural areas. Several medical schools in Australia have piloted this programme with significant results and success (Walker et al., 2003; The Network: TUFH, 2006). IPE is defined as "members of more than one health and/or social care professions learning interactively together, for the explicit purpose of improving inter-professional collaboration and/or the health/well-being of patients/clients. Interactive learning requires active learner participation, and active exchange between learners from different professions such as doctors, nurses, dietician, social workers and pharmacist. The characteristics of effective IPE include shared objectives, mutual support, effective participation and an understanding of professional roles. These characteristics can be learned at every level of health professional education. Inter-professional health care teams working well together have shown to improve the quality of health care cost efficiencies.

PARTNERSHIP IN RURAL HEALTH PROMOTION

Health and illness are complex concepts. Models are used to explain the relationships and the client's attitudes towards health and health practices. People will take action for their health based on their health beliefs. Health beliefs are a person's ideas, convictions and attitudes about health and illness. Their beliefs may be based on information, common sense, myths or realities or false expectations. Since health behaviours usually result from health beliefs, they can positively or negatively affect health. Positive health behaviours are activities related to maintaining, attaining or regaining good health and preventing illness such as adequate exercise, rest, sleep, diet and nutrition. Negative health behaviours include practices actually or potentially harmful to health such as smoking, drug or alcohol abuse, poor diet and lack of exercise.
One of the health belief models that has been widely used in health care practice is a high-level wellness model developed by Halpert Dunn (1977) (Wikipedia, 2010). The model focuses on maximising the health potential of an individual, family, or community. It requires the individual to maximise his/her potential within the environment where he/she is functioning. Some factors that affect wellness include the presence of physical or mental disabilities, smoking, drinking alcohol, inhaling toxic particles, lack of exercise, nonavailability or underutilisation of health care facilities and environmental pollution. Wellness can be maximised through continuous and persistent health promotion.

The term health promotion indicates the process of enabling people to increase control over and to improve health (WHO, 1986). This emphasises on preventive approaches by adopting various healthy habits that will improve health and protect it. The goal for health promotion is to raise the individuals', families', groups' and communities' level of wellness through increasing their understanding of health, raising standards for health, and assist in developing more positive health practices. Promotion for healthy living include various activities such as health education, environmental modification, good nutrition and healthy lifestyle and behavioural changes.

Health education includes educational activities, which enhance well-being and diminish ill-health among individuals, family and community as well as the policy makers. It is one of the most cost-effective interventions. The targets for educational efforts may be the general public, patients and priority groups. Environmental modifications require environmental modifications such as provision of safe water, installation of sanitary latrines, improvement of housing, and control of vectors and rodents. Nutritional interventions include supplementation of food through school meal programmes and iron and vitamin supplementation for children especially adolescent girls. Nutrition education is an important programme to promote good nutrition and health. Lifestyle and behavioural changes can be initiated by imparting knowledge and interventions related to health. Efforts have been made to provide health promotive services in the area of
family planning, maternal and child care, immunisations, sexually-transmissible diseases control, blood pressure control, toxic agents control, occupational safety and health, accidental-injury control, fluoridation of community water supplies, infectious-agent control, smoking cessation, reduction of alcohol and drug abuse, improved nutrition, personal and environmental hygiene, exercise and fitness, as well as stress control.

Health education and intervention can be applied in the community using an individual approach, mass or combination. Individual approaches are normally more popular but limited to high-risk individuals only. While mass approach is less popular but if applied efficiently it may be the most cost-effective approach, in the long-run. In most developed countries, the evidence of impact from mass health education and intervention is so prominent such as high-cholesterol prevention programme and blood pressure reduction programme the cardiovascular disease education. The major factors associated with success in health promotion are people participation and empowerment of the community.

Empowerment in Rural Health Promotion

Empowerment means the assumption of responsibility by the participating party or in this case the rural community. By empowering them to take care of their own needs and health, it will create unity for health where all partners or stakeholders involved, work together with the community to maintain and protect health. The challenge of setting up a sustainable health service delivery system is based on the people's need for active contribution of key stakeholders or key partners. Five principal partners have been identified, namely policy makers, programme managers, health providers, university professionals and the community. They must share a common set of values which are quality, equity, relevance and cost-effectiveness. The partnership pentagon illustrates the possible interrelationship between partners with the common aim of creating a service based on people's need (Figure 4).
The PUPUK Programme: A Case Study

UMS, as a leading institution in rural health in the region, has been adopting the holistic model of health and strongly supports the wellness paradigm in maintaining and protecting health for rural population in Sabah. Since its inception in 2003, the UMS School of Medicine has been adopting a curriculum that emphasised community development and empowerment of health. One of the programmes that was introduced is called PUPUK (Program Perkongsian Universiti-Keluarga), the UMS-Community Partnership in Wellness Programme (UCPWP) (Figure 5). The acronym has a significant connotation since “pupuk” in Malay means fertilise or nurture which is reflective of the nature and outcome of the programme. It is a five-year community-based programme. Based on a smart partnership (win-win) between the university and the community that focuses on the families of the indigenous population in Sabah. The programme emphasises on family health, since family is the most powerful source of influence on an individual’s social development. By promoting health in the family, the whole family and community will benefit from the programme. The programme has been accepted locally and internationally (Osman Ali, 2007; Osman Ali, 2008a; Osman Ali, 2008b; Osman Ali, 2009a; Osman Ali, 2009b).

The Objectives of this Programme

At the end of the programme, students will be able to:

(i) describe the structure of the family as a unit
(ii) appreciate the family dynamics in facing life’s events
(iii) appreciate the individuals and family’s perception and attitude towards illness and wellness.
(iv) appreciate the interplay of biopsychosocial and spiritual factors that influence health
(v) strategise and formulate comprehensive intervention plans to meet the needs of the family.
**Family Fostering**

Students are assigned to a foster family for the period of their medical study programme. The selection of the foster family is based on:

(i) selection made by the village head with consent of the medical school and the family  
(ii) accessibility of the family’s house  
(iii) safety of the students  
(iv) socio-economic background of the family  
(v) assistance from outside agencies  
(vi) chronic medical or psychosocial problems

(criteria i and ii are compulsory for all families, and at least one more criteria of iii, iv or v)

**Implementation Stages**

Stage 1 (Family adoption week)

(i) Every two students will be assigned to one foster family.  
(ii) This family serves as a baseline for the students to understand family as a basic functional unit.  
(iii) They will define the role of the family and learn to appreciate the interaction of each individual of the family such as dependency, expression of feeling and sibling rivalry.  
(iv) The students must appreciate the cultural, social, economic and religious practices that govern the family.

Stage 2 (Regular visit)

(i) Students have to visit the family at least three times per year.  
(ii) Students are required to identify important family life events. They must appreciate the changes that occur in the family.
(iii) They should be able to identify the coping mechanism that deals with significant life events such as help-seeking behaviour and crisis management.

Stage 3 (Intervention and reporting)

(i) Students are required to analyse the information gathered from the family, interpret the results and make a report.
(ii) They have to identify the common health problems faced by the family.
(iii) Students are expected to plan and carry out an intervention programme that is tailored to the needs of the family with the guidance of their academic supervisor.

Evidence of Impact

The programme produces reports as part of the medical students’ training and assessment at the end of each year (annual report) and at the end of fifth year (programme report). The school has been given a permanent building to host and monitor the community health programme in the rural area named Rural Medicine Education Centre (RMEC) in Sikuati, Kudat. This centre which was completed at the end of 2008 has been used to run all health promotion activities in the area and is equipped with a specialty clinic to look after the health of the people in this area. Priority is given to the family in the PUPUK’s programme. RMEC is expected to become a centre of excellence for rural health research and services development for UMS, Sabah and the country in the near future. Efforts have been made to collaborate with universities in the Asia Pacific region through APACPH (Asia Pacific Consortium of Public Health) in the study of rural and island health (Osman, 2009b).

So far, the effectiveness of programme has not been evaluated, especially the impact of the programme on the community. However, through assessments and continuous feedback from students have shown that the programme is able to
increase the knowledge and change the practice of some the families in health care and other aspects of life. On the part of the students, they felt that this programme is able to inculcate caring behaviour among medical students towards the family and the community. Students learn much about the influence of culture, religion, respect and sensitivity of the communities.

**Power to be Healthy**

From this experience, it is clear that for people to have power over their health, first requires knowledge. However, knowledge is not sufficient. They must be in a position to choose better health. They must be able to make right choices and practise it. People should be empowered to make the healthy choices for themselves. They should be given freedom to participate actively in promoting health within their community (Brundtland, 1998).

World Health Assembly Resolution WHA48.8 encourages all countries to reform medical education and practice that give more emphasis on health promotion and disease prevention, especially when there are wide disparity and inequality of health services between areas and ethnicities especially in the rural areas (Boelen, 1999). These efforts will increase its relevance, quality, cost-effectiveness and equity in health care. In the long-term, students and communities will benefit from the partnership (win-win situation). Students will learn about community education and development, while the community will improve their health status and well-being. In this spirit, the PUPUK programme follows the spirit and intention of the WHA Resolution.

**RMEC: Centre of Excellence in Rural Health Promotion**

In Malaysia, there are still very few centres of excellence in health promotion, especially centres dedicated for promoting health in rural areas. UMS through its medical school has made a great effort in this area by developing the centre for rural health promotion, situated
in Sikuati, Kudat (Figure 9). It is a centre which aims to train medical practitioners in rural health in order to fulfill the need of health care in rural areas especially in Sabah and Sarawak. The objectives of setting this centre are to become:

- A centre of excellence in rural health research and in tandem with the aspiration and aims of the UMS School of Medicine and community medicine.
- A hub for organising seminars, workshops and conferences on rural health research.
- A centre for organising, supervision, teaching, educating and research for postgraduate programmes.
- A platform to strengthen networking and research collaboration with other centres of excellence locally and internationally.
- A centre for development, extension, research, consultation, training and referral in rural medicine in this region.

RMEC meets the criteria of the centre of excellence (COE) since it has the human resources with vast knowledge and experience in various disciplines; is directly involved in generating, disseminating and using expertise to preserve the well-being of the population; has a strong leadership that supports team spirit and research culture; shows direction to create and innovate; has secure funding; has established linkages and networking; and has promoted research environment or culture such as frequent communication on research, informal discussion on research issues, journal club, and writing workshops. RMEC is currently being monitored through two main indicators:

- **Competitive impact** The ability of research results to put institution in a forefront in the competition.
- **Competitive strength** The ability of the experts/researchers, their commitment, research projects available and ability to lead the projects.
In 2009, following the post- APACH conference on rural medicine in Kota Kinabalu, APACPH, the regional association of public health institution has selected RMEC as a collaborative centre in island and rural health.

**CONCLUSION**

Inequity and inequality in health care provision still persist in many countries and the gap is widening by each year. As the rich gets richer and the poor gets poorer, advances in science and technology are giving better health and longer lives for a small proportion of the world's population. The divide is very obvious among rural and urban populations in the developing and underdeveloped countries. With increasing demands on health care, especially in relation to population growth, longevity, lifestyle issues, HIV/AIDS and greater consumer demands, the spiraling cost of drugs and health technologies, the challenge to provide health for all and the effort to achieve the millennium goal will be a great challenge and pose an ascending battle.

A major contributor to the crisis is the shortage of health care professionals worldwide. There is a shortage of doctors, nurses, midwives and allied health professionals in most countries and the most severe is in the poorest countries. The shortage is affecting the provision of health care, especially in rural areas. In most cases, lack of educational opportunities and facilities in rural areas has lowered the interest of the doctors to practise in rural areas. Some of strategies to attract the health professionals to rural areas are by increasing the number of students from rural backgrounds for medical training and by increasing the amount of exposure of undergraduate students to rural settings and environments. To retain health professionals in the rural areas, more flexible, integrated and coordinated rural practice vocational programmes and specifically-tailored continuing education and professional development programmes, which meet the identified
needs of rural family physicians have to be instituted immediately, supported by relevant ICT infrastructures.

Medical schools should take the responsibility to educate appropriately-skilled doctors to meet the needs of populations in their geographic region. The UMS School of Medicine, has taken a proactive step in producing doctors who are culturally-sensitive to local population needs and at the same time develop skills to function effectively in any community. Community-based education, especially the PUPUK programme implemented in the medical curriculum is one of the initiatives to attract more medical graduates and other health care professionals to rural areas, especially in Sabah, to practice medicine and at the same time have the opportunity to develop and empower the community. The future of rural health will depend on the commitment of stakeholders especially the Government and policy makers to understand the root of the problems and to support the reformation of medical education and community development.


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Osman Ali is a public health professor at the Universiti Malaysia Sabah. He is the founding Dean of School of Medicine, UMS and has served since 2003. Prior to joining UMS, he is a professor at the Universiti Kebangsaan Malaysia (UKM), where he served for two decades. He was born in Kluang, Johor, in 1955 and brought up in deprived circumstances and environment. Son of a taxi driver and mother a housewife, he was given a Malay school education since primary school. At secondary level, he studied at Sekolah Alam Shah, Cheras for four years before joining UKM in the medical programme. He was awarded a medical degree (MD) in 1981 and underwent housemanship at Hospital Kuala Lumpur.

Due to his passionate interest in education, he joined UKM in 1984 as a trainee lecturer in community health. With the motto and firm conviction that a success and excellence are everywhere if we work hard, he continued his study in the field of public health subspecialty in epidemiology at the Tulane University, USA and awarded the Master of Public Health (MPH) in 1984. Since there was lack of PhD scholars and research expertise in the field of health, he then pursued his doctoral degree (PhD) in UKM under the supervision of Prof. Dr Khalid Abd. Kadir, an endocrinologist. He obtained his PhD degree after three years and continued his interest in the study of epidemiology of endocrine diseases, especially diabetes mellitus and Iodine Deficiency Disorder (IDD), focused on the Orang Asli in Malaysia. He has published many articles and presented papers at local and international conferences in this field. Due to hard work on research and publications, he has published more than 100 articles and three books in the field of public health. He was appointed as an associate professor in 1992 and as a professor two years later.

He was awarded the Royal College of Physician Research Award in 1993 and the UKM Medical Faculty Research Award in 2003. He is also active in social and community service organisations. He was the founding president of the Malaysian
Public Health Physicians’ Association, who championed public health specialty. He was a former Vice President of the Chapter of Public Health Medicine, Academy of Medicine. He is a Fellow of the College of Public Health Medicine, Academy of Medicine (FAMM). At the national level, he is involved in various committees related to nutrition, diabetes and IDD. He was also a member of the Malaysian Medical Council from 2001 to 2010. At the international level, he served as Treasurer of the Asia Pacific Clinical Nutrition Society (APCNS) in 1998 and the council member of Asia-Pacific Academic Consortium for Public Health (APACPH) since 2008. On his service in government and community services, the state government of Sabah has awarded him Ahli Setia Darjah Kinabalu (ASDK) in 2010. In the same year the federal government has awarded him Jasa Setia Mahkota (JSM) for the same motive.

As the Dean of School of Medicine UMS, he is responsible to develop the curriculum, infrastructure and human resources of the school. He pledged to develop it to become an institution that successfully produces doctors with recognised skills and able to provide services anywhere in the world, safely and ethically.