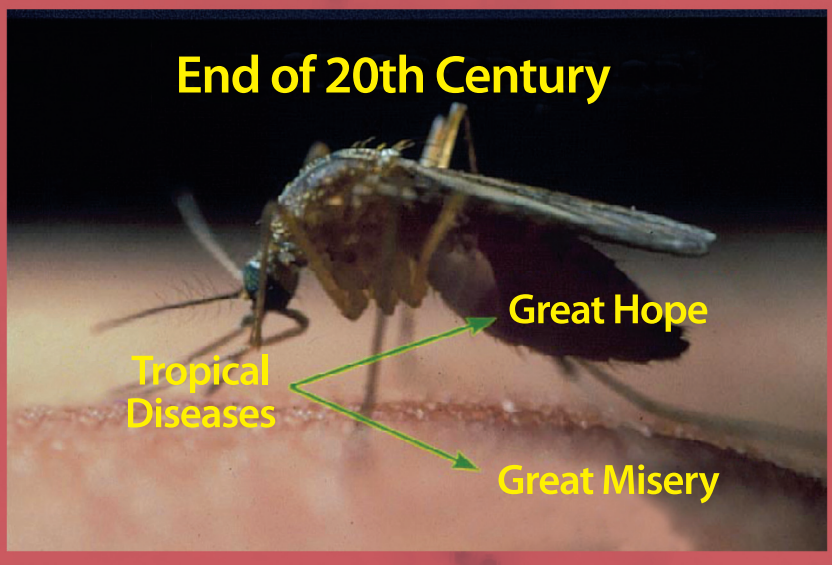
ASM Advisory Report 1/2012



The Status of Research and Development in Advancing Tropical Medicine in Malaysia

MOSTI

AKADEMI SAINS MALAYSIA

INSTITUTE FOR MEDICAL RESEARCH MALAYSIA

The Status of Research and Development in Advancing Tropical Medicine in Malaysia

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Foreword

I would like to convey my congratulations to the ASM Tropical Medicine Task Force for producing this Advisory Report, entitled "The Status of Research and Development in Advancing Tropical Medicine in Malaysia".

We believe that this Advisory Report is most timely in view of the growing new areas of study, such covering "Medicine in the Tropics" as functional genomics, tissue engineering, and bioinformatics, among many others, which are being pursued with increasingly powerful techniques and instruments. The need to translate these multidisciplinary efforts to the clinical setting is becoming increasingly urgent.

A number of recommendations, arising from both the earlier Workshop and the Forum, to enhance research in medicine in the tropics are proposed as follows:

1. Create a task force/advisory role in the enhancing of research in medicine in the tropics in ASM to sustain interest

2. Development of human resource in research field of medicine in the tropics

3. Create a research culture in medicine

4. Career development in medical research

5. Training of researchers

6. Enhancement of research infrastructure/support

7. Funding and Evaluation; and

8. Research policy on medicine in the tropics.

The publication of this Advisory Report is in fulfillment of the Academy's many functions, among which are to provide independent advice to the Government through dissemination of ideas and suggestions amongst decision- and policy-makers, scientists, engineers and technologists through identifying where the innovative use of science, engineering and technology can provide solutions to particular national problems towards sustained national development.

Tan Sri Dr Ahmad Tajuddin Ali, FASc.
President
Academy of Sciences Malaysia

Preface

The desire for a healthier and better world in which to live our lives, and raise our children is common to all people and all generations. As we enter the 21st century, our past achievements and technological advances make us more optimistic about our future than perhaps any stage in recent history.

However, infectious tropical diseases are still the world's biggest killers of children and young adults. For those living in developing countries, among the poorest of the poor no matter what their age, the risk of death and disability is always many times higher than those living in the developed world. Over 500 million people on earth, that is one living person in ten, suffer from one or more of the major infectious tropical diseases. While health globally has steadily improved over the years, on the other hand many people living in poorer countries have seen little, if any, improvement at all. The gaps between the health status of rich and poor are at least as wide as they were half a century ago, and are becoming wider still. Despite this, the most important pattern of progress now emerging in general globally is an unmistakable trend towards healthier, longer life.

More people than ever before now have access to at least minimum health care, to safe water supplies and sanitation facilities. The spectacular unveiling of the human genome in 1999 and subsequent mapping has totally revolutionized our thoughts and understanding of disease and treatment.

The neglected tropical diseases are a group of 13 major disabling conditions that are among the most common chronic infections in the world's poorest people. If new resources are made available, as has been recommended by the Commission for Africa, a scaled-up approach to simple interventions could lead to sustainable decreases in poverty in some of the world's poorest countries. These decreases would represent a major success story for the United Nation's Millennium Declaration.

This Report is the final product arising from a stakeholders' consultative approach with inputs from collaborators such as the Institute for Medical Research (IMR), including the strong support from the Ministry of Science, Technology and Innovation (MOSTI), and the Ministry of Health (MOH), to convene the one-day forum on the "Status of R&D in Tropical Medicine in Malaysia". This forum provided a platform for experts, health players, relevant government agencies and non-government organisations, and other key stakeholders to undertake a situational analysis of the current status of research in tropical medicine in the country.

We have had a decade or two of unprecedented scientific progress in medicine and there is great promise of more. But we cannot rest on our laurels. The infectious tropical diseases are in danger of being forgotten by a rich world that has forgotten its poor, and they will be forgotten, unless we take an aggressive and entrepreneurial approach, to grasp the scientific, political and economic opportunities that arise, and set in place good defense against the evolution of our biological enemies.

It is the task of all of us to make sure that infectious tropical diseases will not fall back into the darkness of middle-ages.

Academician Prof Emeritus Dato' C.P. Ramachandran, FASc.
Chairman
ASM Task Force on Tropical Medicine

ASM Task Force on Tropical Medicine

The Members of the ASM Task Force on Tropical Medicine are as follows:

Prof Emeritus Dato' C.P. Ramachandran, FASc. (Chairman)
Academician Tan Sri Dr. M. Jegathesan, FASc.
Prof Emeritus Dato' Lam Sai Kit, FASc.
Prof Dato' Khalid Yusoff, FASc.
Prof Mak Joon Wah, FASc.
Prof Abu Hassan Ahmad
Prof Osman Ali, UMS
Dr Shahnaz Murad, IMR
Dr Lee Han Lim, IMR
Associate Prof Stephen Periathamby Ambu, IMU
Dr Sha'ari Ngadiman, MOH
Prof Norlijah Othman, UPM
Associate Prof Zairi Jaal, USM
Dr Adznan Abdul Karim, WILDLIFE

The Academy of Sciences Malaysia would like to acknowledge the following for their contribution as Rapporteurs to the *Tropical Medicine Forum* held on 21st June 2011 at the Medical Academies of Malaysia:

Dr Nazni Wasi Ahmad, IMR
Dr Yvonne Lim Ai Lian, UM
Ms Adela Ida Jiram, IMR
Ms Jeyanthi Suppiah, IMR

The Advisory Report was prepared and compiled by Dr Yvonne Lim Ai Lian, UM, and P. Loganathan, ASM.

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The Status of Research and Development in Advancing Tropical Medicine in Malaysia

Executive Summary

The infectious tropical diseases are still the world's biggest killers of children and young adults. The risk of morbidity and mortality related to disability and death is many times higher in economically disadvantaged communities in developing countries compared to those living in the developed countries. It is reported that over 500 million people on earth, that is one living person in ten, suffer from one or more of the major infectious tropical diseases. While health globally has steadily improved over the years due to better access to minimum health care to safe water supplies and sanitation facilities, on the other hand many people living in poorer countries have seen little, if any, improvement at all. The gaps between the health status of the rich and poor remain as wide as they were half a century ago, and in some cases becoming wider still.

Neglected tropical diseases (NTD) are amongst some of the most common infections in the estimated 2.7 billion people who live on less than USD2 per day (the poorest of the poor). These diseases which occur primarily in rural areas and in some poor urban settings of low-income countries in sub-Saharan Africa, Asia-Pacific, and Latin America, lead to long-term disability and poverty. In aggregate, NTD cause approximately 534 000 deaths annually.

Since the establishment of the Institute for Medical Research (IMR) in Kuala Lumpur in 1900, IMR has played significant global role in enhancing research in tropical diseases, towards their treatment, control and prevention. Some of the basic and fundamental discoveries in tropical diseases were evident in diseases such as malaria, lymphatic filariasis, scrub typhus, leprosy and other parasitic and bacterial infections. The IMR today is more than 110 years old and stands as a Malaysian major global player in the fight against NTD. IMR has in the past 40 years played a significant role in the region and contributed to SEAMEO – TROPMED. Till today, the IMR houses the WHO Regional Centre for Research and Training in tropical diseases.

The Malaysian Ministry of Health (MOH) has had a leading role in health research policy, which is rarely seen in Western countries. This has been due to the foresight of a number of its leader who had, in seeing the importance of Health Research as a tool in development, taken steps to integrate it into the organizational and operational framework of its programmes. The IMR, while being a separate federal department at its time of founding, was very shortly afterwards placed under MOH as its research arm, a function it executes till this day. But the recognition that research goes beyond biomedical research and also that it should be an integral part of every health professional work led to the addition of "Research" as a separate programme to the Ministry's other programmes in1986.

Over 100 years, Malaysia was among the leaders in tropical diseases research. However, in this recent past, we have fallen back on our lead — reasons perhaps many changing pattern of diseases, lack of support, limited financial and human resources, and other reasons. Surely we should not allow this to happen. We need to continue to play a pivotal role and strategic role in tropical disease research in the country and the region. We have the resources; we have the talents and the technical know-how. Our younger generation of scientists, doctors, public health workers and researchers should be motivated to embark on tropical disease research on all aspects of biomedical, lab-based, field-based as well as clinical research to accelerate new knowledge towards the control and elimination of tropical diseases in this region.

At an earlier one-day workshop entitled *Enhancing the Environment for Medical Research*, held on 3 November 2007 and at the one-day forum on the *Status of R&D in Tropical Medicine in Malaysia*, held on 21 June 2011, and both organised by the Academy of Sciences Malaysia (ASM), it was generally agreed that the success of tropical diseases research should be further enhanced by developing inter- and intra-collaborations between the research institutions and the universities. By advocating such collaboration, research output will be of high standards and quality, leading to a further reduction in the duplication and repetition of research projects and resources.

A number of recommendations, arising from both the earlier Workshop and the Forum, to enhance research in medicine in the tropics are proposed as follows:

1. Create a task force/advisory role in the enhancing of research in medicine in the tropics in ASM to sustain interest

2. Development of human resource in research field of medicine in the tropics

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4. Career development in medical research

5. Training of researchers

6. Enhancement of research infrastructure/support

7. Funding and evaluation; and

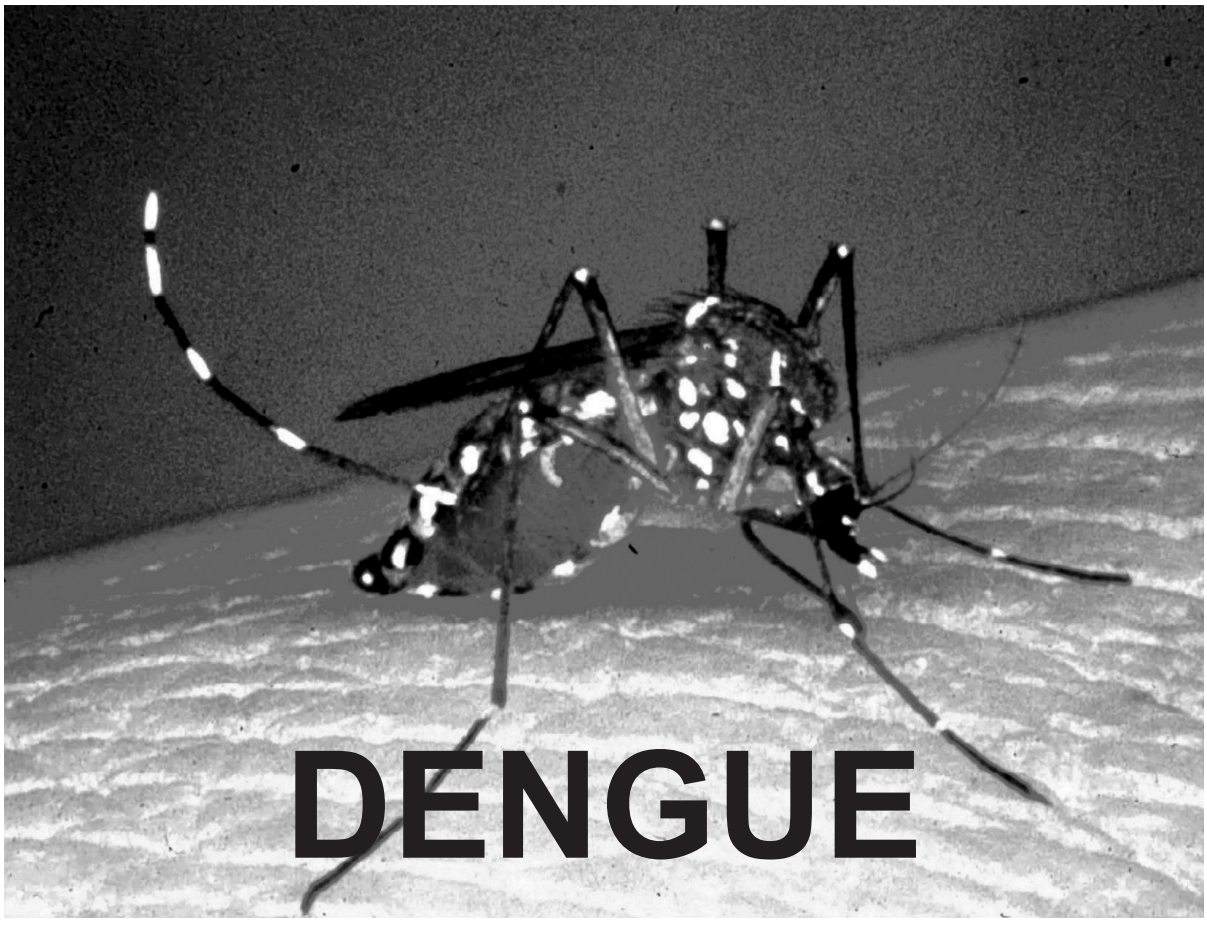
8. Research policy on medicine in the tropics.

Global Picture

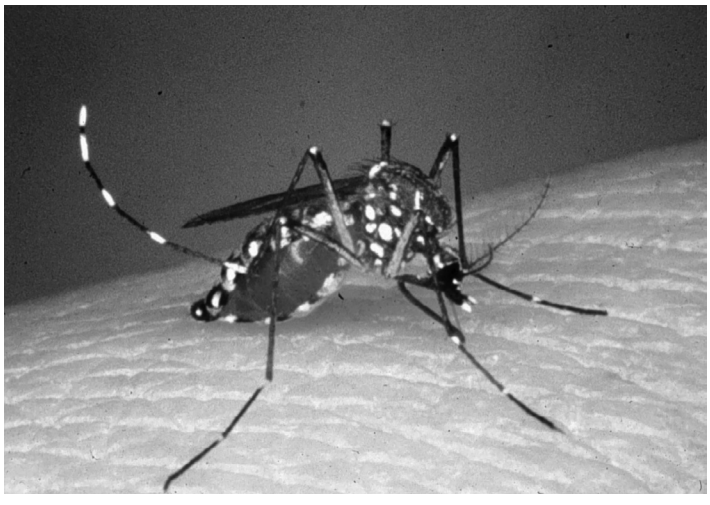
Malaria

- 300 – 500 Million
  Clinical cases
  per year (90% in Africa)
- 1.5 – 2.7 Million deaths a year
  (1 Million among African Children)
- Incidence of major clinical cases outside
  Africa, in India; Brazil; Sri Lanka;
  Afghanistan; Thailand; Vietnam; Colombia

Lymphatic filariasis



Dengue Vectors



Aedes aegypti

Aedes albopictus

Introduction

It has been more than a decade when the promise of a revolution in human health was announced. The spectacular unveiling of the human genome unfold many secrets of human life and revolutionized the diagnosis, prevention and treatment of many human diseases. Indeed, the genomic age has produced significant medical advances. Technological advances have made us more optimistic about our future now than perhaps at any stage in recent history.

The infectious tropical diseases are still the world's biggest killers of children and young adults. The risk of morbidity and mortality related to disability and death is many times higher in economically disadvantaged communities in developing countries compared to those living in the developed countries. It is reported that over 500 million people on earth, that is one living person in ten, suffer from one or more of the major infectious tropical diseases. While health globally has steadily improved over the years due to better access to minimum health care to safe water supplies and sanitation facilities, on the other hand many people living in poorer countries have seen little, if any, improvement at all. The gaps between the health status of the rich and poor remain as wide as they were half a century ago, and in some cases becoming wider still.

The Millennium Declaration, adopted by world leaders at the United Nations in September 2000, establishes an ambitious set of eight millennium development goals to eliminate extreme poverty, hunger and diseases by 2015. Thirteen major disabling parasitic and bacterial infections were identified as being neglected and are comprised three soil-transmitted helminth infections (i.e. ascariasis, hookworm infection, and trichuriasis), lymphatic filariasis, onchocerciasis, drancunculiasis, schistosomiasis, Chagas disease, human African trypanosomiasis, leishmaniasis, Burundi ulcer, leprosy, and trachoma. An expanded list includes dengue, the treponematoses, leptospirosis, strongyloidiasis, food-borne trematodiases, neurocysticercosis and scabies, as well as other tropical diseases.

Neglected tropical diseases (NTD) are amongst some of the most common infections in the estimated 2.7 billion people who live on less than USD2 per day (the poorest of the poor). These diseases, which occur primarily in rural areas and in some poor urban settings of low-income countries in sub-Saharan Africa, Asia-Pacific, and Latin America, lead to long-term disability and poverty. In aggregate, NTD cause approximately 534 000 deaths annually.

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Over 100 years, Malaysia was among the leaders in tropical diseases research. However, in this recent past, we have fallen back on our lead — reasons perhaps many changing pattern of diseases, lack of support, limited financial and human resources, and other reasons. Surely we should not allow this to happen. We need to continue to play a pivotal role and strategic role in tropical disease research in the country and the region. We have the resources; we have the talents and the technical know-how. Our younger generation of scientists, doctors, public health workers and researchers should be motivated to embark on tropical disease research on all aspects of biomedical, lab-based, field-based as well as clinical research to accelerate new knowledge towards the control and elimination of tropical diseases in this region.

At an earlier one-day workshop entitled *Enhancing the Environment for Medical Research*, held on 3 November 2007 (*Appendix 1*) and at the one-day forum on the *Status of R&D in Tropical Medicine in Malaysia*, held on 21 June 2011 (*Appendix 2*), and both organised by the Academy of Sciences Malaysia (ASM), it was generally agreed that the success of tropical diseases research should be further enhanced by developing inter- and intra-collaborations between the research institutions and the universities. By advocating such collaboration, research output will be of high standards and quality, leading to a further reduction in the duplication and repetition of research projects and resources.

With the fast pace of globalisation and importance of healthcare, tropical diseases *per se* may not be the threat in the future. As more and more countries reach developed nation status, among the many of the diseases which are apparent in developing countries, the non-communicable diseases are also becoming a major problem in this part of the world. In view of the increasing numbers of mortality and morbidity due to non-communicable diseases (NCDs) in Malaysia as well as in this region — the future of Preventive Medicine lies in addressing issues related to "Medicine in the Tropics" and not Tropical Diseases *per se*. Accordingly, the words "tropical medicine" may be a misnomer in the near future and a better way of addressing this would be as "Medicine in the Tropics".

A number of recommendations, arising from both the earlier Workshop and the Forum, to enhance research in medicine in the tropics are proposed as follows:

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2. Development of human resource in research field of medicine in the tropics

3. Create a research culture in medicine
4. Career development in medical research
5. Training of researchers
6. Enhancement of research infrastructure/support
7. Funding and evaluation; and
8. Research policy on medicine in the tropics.

Create Task Force/Advisory Role Towards Facilitating the Enhancing of Research in Medicine in the Tropics in ASM to Sustain Interest

- Improved dissemination of information about the value and importance of research in the field of medicine in tropics.

Development of Human Resource in Research Field of Medicine in the Tropics

- Development of programmes to attract capable students to scientific careers early in their career decision-making process.
- Enhanced financial support, including stipends, for trainees entering areas of critical shortages.
- Structure research through the National Institutes of Health to strengthen medical research.
- Provide avenues for early exposure to research in order to facilitate the research agenda e.g. system in IMU allows students to complete a 1-year BMedSc programme and go on to MBBS and subsequently on to a PhD programme.
- Provide researchers with 'protective time' for Academic staff to conduct research. Institutes of Higher Learning must invest in allowing academic staff to do their PhD (e.g. USM has achieved 66% of Academic staff with PhD).
- Balanced portfolio approach is important as younger lecturers may face difficulty meeting the KPIs.
- As clinical programmes require at least 2 to 3 clinicians with PhDs, there is a need to incentivize these faculty to contribute their expertise.

- Improving output of research is closely related to:
  - Encouraging publications
  - Facilitating a lateral transfer from University hospitals to research institutes such as the Institute for Medical Research.

- Allowing consultants to have private practice results in reducing time for research activities.

- Ideally, the hospital budget for research should come from the Ministry of Health but the university budget (medical faculty) should be provided by the Ministry of Higher Education. However, realistically enhancing medical research cannot be done at the expense of the development of the rest of the university.

- It is important to choose different people with relevant skill sets for different aspects.

- Senior Professors still need to be involved with undergraduate level training in order to inspire, motivate and drive them.

- Academic management particularly concerning the Medical discipline is a serious issue there is a need to manage people effectively.

- Currently there is no training provided for leadership of medical faculties such as Deans and most learn on the job through trial and error.

- Set targets for achievement of all the recommended strategies.

- Need to develop a viable post-doctorate opportunities / positions / funding.

- Need to develop a culture of mentorship.

Create a Research Culture in Medicine

- Towards aspiring excellence in medical research, a culture of 'Publish or Perish' in line with the need to emphasize the importance of publications needs to be emphasized. Therefore, PhD candidates need to publish first then undertake thesis write-up. In achieving this end, it was also emphasized that these candidates must be given proper guidance and facilities by their supervisors.

- The ASM Medical Discipline group (or the relevant task force) should produce guidelines and benchmarks regarding clinical research.

- When brilliant PhDs / Post-Docs return, they should be placed in established labs and nurtured for at least 2 years.

- If language is an issue for publications, then one must realize that if the science is good, the language aspect can be fixed by journal editors / experts. For example, the paper can be outsourced by establishing writing / publications / journal experts to support research publications on a full time basis. As a further example, the Japanese pay the medical experts to write in English and they have achieved number 3 in the world on the Thomson ISI after USA and UK.

- Joint appointments for Clinicians and Basic Scientists are proposed to enhance medical research by marrying clinical medicine and basic sciences.

- Encourage close collaborations with other Departments / Medical disciplines through joint supervision of PhDs etc.

Career Development in Medical Research

- Establish a 'Vacation Research' programme to facilitate a taste of the research environment and incentivize undergraduates to be involved in research activities.

- Send young people to conferences, present posters etc. in order to open opportunities for them.

- For the first post-doctoral training, the following should be emphasised:

  – Excellent research environment
  – Training fellowship that incorporates training away from home base for better exposure such as 2 years away from home and 1 year at home
  – Concentration of the best minds for mentoring.

- Fostering excellence in investigator-driven research requires the following in place:
  – Excellent researchers
  – Excellent management, and
  – Adequate funding.

- Address concerns of lack of interest in research by balancing content of lectures to include 50% on subject matter and another 50% on the science of the day or research.

- Recognize that those involved in medical research make best teachers.

- Get universities to recognize the research projects and time spent on them by offering credit for it.

- Currently, Malaysia has 29 RSE per 10 000 workforce but the target is 50 RSE per 10 000 by 2020 and every effort must be seriously made to achieve this target.

- Provide opportunities for faculty and clinicians to do own research.

Training of Researchers

- Development of a Scientist Mentorship Network among scientists with research expertise and experience.

- Provision of specialized training for physicians in research disciplines and for Ph.D. scientists in clinical disciplines.

- Development of new courses and expansion of existing training programs to address needed new technologies and competencies.

- Inclusion of training components in new research programs.

- Levels should include "survival skills" such as grant and manuscript writing, public speaking, obtaining funding, and promoting effective collaborations.

- Specific requirements in training programs should begin to include such mathematicallybased areas as bioinformatics, statistics, and dynamic analysis, when relevant. Programs in disciplines related to clinical research should also include training in epidemiology, clinical trials, and behavioral science.

- Specialized intensive courses should be developed, to improve skills and awareness of new technologies and methods, such as studies based on DNA arrays.

- Mechanisms need be found to always have infusion of new blood in research institutes or institutions eg most posts should not be permanent but rather taken up for a specified period of time (eg 5 years) by talents from other agencies.

- Task tracks such as Senior Researchers, Junior Researchers, and create Eminent Scientist posts in research institutes and research institutions.

- Training in research management for middle and top level scientists

Enhancement of Research Infrastructure/Support

- Establishment of a national centre for the evaluation and validation of diagnostic tests to verify their sensitivity and specificity for national usage.

- Small institutions having particular but limited strengths and facilities should be encouraged to collaborate with similar institutions with complementary strengths, in joint training awards.

- Collaboration between academia and private industry should be pursued to help build and complement needed competencies.

Research Funding and Evaluation

- Funds need to be evenly distributed to various research institutions and universities and granted based of principle investigator's good track record.
- Development of partnerships with industry in funding training programmes.
- Need to have a relook at the mechanism of funding disbursement — currently it is poor in both evaluation and monitoring aspects.
- Establish training schemes for assessors to be trained in evaluation of research proposals and reports and outputs.

Research Policy on Medicine in the Tropics

- Formulation of national agenda on medicine in the tropics research through enhancing inter- and intra-collaborations between the Research Institutions and the Universities and enlarging the scope, particularly in the epidemiology field, NTD and surveillance systems.
- Development by the scientific community of innovative approaches to research training, emphasizing multidisciplinary approaches, networking and collaboration, and linking multiple institutions with unique expertise into "virtual" training centers.
- ASM can assist in developing a research policy on medicine in the tropics for consideration by the NSRC.
- Reconsider the need for too many short-term projects (just for getting papers published).
- Establish 'Molecules to Market' programmes in specific tropical indigenous products such as palm oil and in the nation's biodiversity wealth. There needs to be sufficient resources provided for focussed research in basic biodiversity research (including in the training of the necessary human capital) as well as in bringing the basic research to commercialisation. The nation should benefit from its natural resources and endowments.
- Programmes should be established to enable Malaysia to lead in the area of Medicine in the Tropics such as in one or other tropical infections diseases, one in noncommunicalble diseases, one in cancers affecting tropical countries.

CONCLUSION

As we enter a period of great challenges and excitement in which scientific knowledge is changing and accruing at a fast pace, extraordinary opportunities present themselves for making substantial progress in all aspects of medicine in the tropics. New areas of study, such as functional genomics, tissue engineering, and bioinformatics, among many others, are being pursued with increasingly powerful techniques and instruments. The need to translate these multidisciplinary efforts to the clinical setting is becoming increasingly urgent. The recommendations presented here will be beneficial in developing the human resources and infrastructure capable of meeting the challenges of medicine in the tropics research, set against the rich diversity and rapidly changing demographics of Malaysian society.

Appendix 1

Workshop on "Enhancing the Environment for Medical Research"

3 November 2007
9.30 a.m. – 4.30 p.m.
Venue: New Council Room, Academy of Sciences Malaysia

Attendance

1. Prof Dato' Dr C.P. Ramachandran, FASc. (*Chairman, Medical Sciences Discipline Group / Chairman of Session*)
2. Prof Dato' Dr Khalid Yusoff, FASc. (*Chairman of Session*)
3. Tan Sri Dato' Dr Abu Bakar Dato' Suleiman, FASc. (*Presenter*)
4. Prof James Angus (*Presenter*)
5. Emeritus Prof Dato' Dr Khalid Abdul Kadir, FASc. (*Presenter*)
6. Datuk Dr G. Sreenevasan, FASc.
7. Emeritus Prof Dato' Dr Lam Sai Kit, FASc.
8. Prof Mak Joon Wah, FASc.
9. Prof Dato' Dr Khairul Anuar Abdullah, FASc.
10. Prof Dr Asma Ismail, FASc.
11. Prof Abdul Aziz Baba (*Dean, School of Medical Science, Health Campus, USM*)
12. Prof Rosmawati Mohamed (*Deputy Dean, Faculty of Medicine, UM*)
13. Prof Dr Azhar Md. Zain (*Dean, Faculty of Medicine, UPM*)
14. Prof Dr Osman Ali (*Dean, School of Medicine, UMS*)
15. Prof Dr M. Fauzi (*UIA*)

Secretariat

Ms Nitia Samuel
Mr P. Loganathan
Ms Norazalina Saad

Salient Points

1. Introduction by Prof Dato' Dr C.P. Ramachandran, Chairman of ASM Medical Discipline Group

   - Reiterated that this Workshop was a follow-up of two prior meetings i.e. the talk by Tan Sri Datuk Dr Mohd Ismail Merican, FASc. on 15 Sept 2007 on 'Health Status and Issues in Malaysia" and the Brainstorm session of the ASM Medical Discipline Group on 22 September 2007.

- The main objective of the Workshop was to provide input towards recommending a proposal for an Advisory Report on increasing caliber of Academic Staff as well as increasing capability in medical research.

- The Chairman also gave a brief introduction of all the presenters of the Workshop.

2. Human Resource Development in Medical Research by Tan Sri Datuk Dr Abu Bakar Suleiman FASc., President, International Medical University

- Suggestion: Structure research through the National Institutes of Health to strengthen medical research.

- Provide avenues for early exposure to research in order to facilitate the research agenda e.g. system in IMU allows students to complete a one year BmedSc programme and go on to MBBS and subsequently on to a PhD programme.

- Stressed that in proposing recommendations, it is important to set recommended targets for achievement as well.

- Provide researchers with 'protective time' for Academic staff to conduct research.

- Institutes of Higher Learning must invest in allowing academic staff to do their PhD (e.g. USM has achieved 66% of Academic staff with PhD).

- Balanced portfolio approach is important as younger lecturers may face difficulty meeting the KPIs.

- The need for leaders in research is glaring.

- Clinical programmes require at least two to three clinicians with PhD.

- Improving output of research is closely related to:
  – Encouraging publications
  – Facilitating a lateral transfer from University hospitals to research institutes such as the Institute for Medical Research.

- Allowing consultants to have private practice results in reducing time for research activities.

- Ideally the hospital budget should come from the Ministry of Health but the university budget (medical faculty) should be provided by the Ministry of Higher Education. However, realistically enhancing medical research cannot be done at the expense of the development of the rest of the university.

- It is important to choose different people with relevant skill sets for different aspects.

- It was proposed that Senior Professors still need to be involved with undergraduate level training in order to inspire, motivate and drive them.

- Academic management particularly concerning Medical discipline is a serious issue and one must learn to manage people effectively.

- Currently there is no training provided for leadership of medical faculties such as Deans and most learn on the job through trial and error.

3. Career Development in Medical Research by Prof James Angus, Dean Faculty of Medicine and Health Sciences and Dentistry, University of Melbourne, Australia

- Some of the methods employed in Australia to encourage involvement in research is:
  - Establishing a 'Vacation Research ' programme to facilitate a taste of the research environment
  - Pay undergraduates around 100.00 Aust. Dollars per day to get into the lab and conduct research activities
  - Send young people to conferences, present posters etc. in order to open opportunities for them.

- For the first post-doctoral training, the following should be emphasised:
  - Excellent research environment
  - Training fellowship that incorporates training away from home base for better exposure such as two years away from home and one year at home
  - Concentration of the best minds for mentoring.

- Awarding of all degrees including PhDs must be the province of universities alone.

- Fostering excellence in investigator driven research requires the following in place:
  - Excellent researchers
  - Excellent management
  - Adequate funding.

- Funding levels will only rise if it can be well justified.

- It was proposed that concerns of lack of interest in research be addressed by balancing content of lectures to include 50% on subject matter and another 50% on the science of the day or the Professor's research.

- Recognize that those involved in medical research make best teachers.

- Get universities to recognize the research projects and time spent on them by offering credit for it.

- At the moment (2007), Malaysia has 18 RSE per 10 000 work-force but the target is 60 RSE per 10 000 by 2020. Given this scenario, if the teaching load keeps increasing, there is a need to think how to rationalize the achievement of the set target.

- Differentiate sectors such as Research Universities have lower intake of undergraduates and focus more on research while other universities focus on teaching.

- Allow flexibility for faculty and clinicians to do own research.

4. Creating a Research Culture in Medicine by Prof Datuk Dr Khalid Kadir, Dean of Clinical Faculty, Monash University, School of Medicine, Malaysia

- Aspiring excellence in medical research requires a culture of 'Publish or perish' in line with the need to emphasize the importance of publications.

- It was proposed that no degrees particularly PhDs be awarded without publications. Revert to the approach whereby the candidate is required to publish first then write-up thesis.

- It was proposed that the ASM Medical Discipline group produce guidelines and benchmarks regarding clinical research etc.

- When brilliant PhDs / Post-docs return, they would be very vulnerable if they are required to set up their own empire. Therefore the best approach would be to place them in established labs and nurture them for at least two years.

- If language is an issue for publications, then one must realize that if the science is good, the language aspect can be fixed by journal editors / experts. For example this can be outsourced by establishing writing / publications / journal experts to support research publications on a full time basis. For example the Japanese pay the medical experts to write in English and they have achieved no. 3 in the world on the Thomson ISI after USA and UK.

- Joint appointment for Clinicians and Basic Scientists was proposed to enhance medical research by marrying clinical medicine and basics science.

- Encourage close collaborations with other Departments / Medical disciplines through joint supervision of PhDs etc.

5. Summing-up by Prof Dato' Dr C. P. Ramachandran , Chairman of ASM Medical Discipline Group

In summing-up the proceedings of the Workshop, Prof. Dato' Dr C.P. Ramachandran, Chairman of ASM Medical Discipline Group, mentioned that the Workshop facilitated interesting discussions and highlighted several challenges for consideration on what approaches should be taken to enhance the environment for medical research.

Appendix 2

Report: ASM Forum on Tropical Diseases

21 June 2011
Venue: Medical Academies of Malaysia, Jalan Tun Razak, Kuala Lumpur

Welcoming Address

PROF EMERITUS DATO' DR C.P. RAMACHANDRAN, FASc

The desire for a healthier and better world in which to live our lives, and raise our children is common to all people and all generations. As we enter the 21st century, our past achievements and technological advances makes us more optimistic about our future than perhaps at any stage in recent history.

However, infectious tropical diseases are still the world's biggest killers of children and young adults. For those living in developing countries, among the poorest of the poor no matter what their age, the risk of death and disability is always many times higher than those living in the developed world. Over 500 million people on earth, that is one living person in ten, suffer from one or more of the major infectious tropical diseases. While health globally has steadily improved over the years, on the other hand many people living in poorer countries have seen little, if any, improvement at all. The gaps between the health status of rich and poor are at least as wide as they were half a century ago, and are becoming wider still. Despite this, the most important pattern of progress now emerging globally is an unmistakable trend towards healthier, longer life.

More people than ever before now have access to at least minimum health care, to safe water supplies and sanitation facilities. The spectacular unveiling of the human genome in 1999 and subsequent mapping has totally revolutionized our thoughts and understanding of disease and treatment.

I believe this century will be the biological age where we will see efforts of genetic revolution and molecular medicine bearing positive results towards disease control and in particular tropical disease control.

The neglected tropical diseases are a group of 13 major disabling conditions that are among the most common chronic infections in the world's poorest people. If new resources are made available, as has been recommended by the Commission for Africa, a scaled-up approach to simple interventions could lead to sustainable decreases in poverty in some of the world's poorest countries. These decreases would represent a major success story for the United Nation's Millennium Declaration.

The Millennium Declaration, adopted by world leaders at the United Nations in September 2000, establishes an ambitious set of eight millennium development goals to eliminate extreme

poverty, hunger and diseases by 2015. The 13 parasitic and bacterial infections known as the neglected tropical diseases include three soil-transmitted helminth infections (ascariasis, hookworm infection, and trichuriasis), lymphatic filariasis, onchocerciasis, drancunculiasis, schistosomiasis, Chagas disease, human African trypanosomiasis, leishmaniasis, Buruli ulcer, leprosy, and trachoma. An expanded list could include dengue fever, the treponematoses, leptospirosis, strongyloidiasis, foodborne trematodiases, neurocysticercosis, and scabies, as well as other tropical infections. The parasitic and bacterial diseases identified as being neglected are among some of the most common infections in the estimated 2.7 billion people who live on less than USD2 per day. These diseases occur primarily in rural areas and in some poor urban settings of low-income countries in sub-Saharan Africa, Asia, and Latin America. The neglected tropical diseases lead to long-term disability and poverty. In aggregate, the neglected tropical diseases cause approximately 534 000 deaths annually.

Ladies and gentlemen,

The world is changing. Competition is on the rise. Nations compete. Regions compete. Companies compete. Individuals compete. The future global economy will be increasingly knowledge-based. Innovation is key to future global economic strength and competitiveness. STI is expected to play a dominant role in economies planning to remain competitive. Resource-poor countries in the world have shown the way how technological superiority can make them powerful in the economic competition. Those which are technologically incompetent, despite being resource-rich, face difficulties creating wealth. Our PM has stressed this on numerous occasions in the recent past.

The Academy of Sciences Malaysia has undertaken a Mega Science Framework Study Sustained National Development for the period 2011–2050. ASM believes that science and engineering can contribute immensely to the future development of Malaysia and in wealth creation and sustainable economic growth.

Since the beginning of 1900, when the Institute for Medical Research (IMR) was established in Kuala Lumpur, the IMR has played a global role in enhancing research in tropical diseases, towards their treatment, control and prevention. Some of the basic and fundamental discoveries in a number of tropical diseases such as malaria, lymphatic filariasis, scrub typhus, leprosy and other parasitic infections were done in the laboratories in IMR. The IMR today is 110 years old and stands as a major global player in the fight against neglected tropical diseases. IMR has in the past 25 years played a major role in the region and contributed to SEAMEO – TROPMED. Even today WHO Regional Centre for Researchers train in tropical diseases in WHO Collaboration Centre.

The Ministry of Health of Malaysia has had a leading role in health research policy, which is rarely seen in Western countries. This has been due to the foresight of a number of its leader who had, in seeing the importance of health research as a tool in development, taken steps to integrate it into the organizational and operational framework of its programmes. The IMR, while a separate Federal department at its time of founding, was very shortly afterwards placed under MOH as its research arm, a function it executes till this day. But the recognition that research goes beyond biomedical research and also that it should be an integral part of

every health professional work led to the addition of research as a separate programme to the Ministry's other programmes in1986.

The importance and influence of research continued to grow under the leadership of the then Director-General of Health, Abu Bakar Suleiman, a firm believer in the indispensable role of Health Research. This reached a zenith in 1994 when a reorganization of the Ministry saw the creation of three Deputy Director-Generals, in charge of the Preventive, Curative and the Research arms of the Ministry. The last of these was called the Research and Technical Support Programme and incorporated the Research, Engineering, Pharmacy and Development Programme. The final saga in the evolution of the research programme in the Ministry, I believe, took place in the closing days of the century with the initiation of the 'National Institutes of Health Concept' in taking the programme forward.

Ladies and gentlemen,

We have had a decade or two of unprecedented scientific progress in medicine and there is great promise of more. But we cannot rest on our laurels. The infectious tropical diseases are in danger of being forgotten by a rich world that has forgotten its poor, and they will be forgotten, unless we take an aggressive and entrepreneurial approach, to grasp the scientific, political and economic opportunities that arise, and set in place good defense against the evolution of our biological enemies.

Malaysia has had a leading role in tropical diseases research for over 100 years. However, in this recent past, we have fallen back on our lead - reasons perhaps many - changing pattern of diseases, lack of support, both financial and human, and other reasons. Surely we should not allow this to happen. We need to continue to play a pivotal role and strategic role in tropical disease research in the country and the region. We have the resources; we have the talents and the technical know-how. Our younger generation of scientists, doctors, public health workers and researchers should be motivated to embark on tropical disease research. On all aspects, biomedical, lab-based; field-based as well in clinical research accelerate new knowledge towards the control and elimination of tropical diseases in this region.

It is the task of all present here today to make sure that infectious tropical diseases will not fall back into the darkness of Middle Ages. I hope the discussions today in this Forum would help us to re-define our strategies in tropical disease research. Thank you.

Keynote Address

Positioning Malaysia in the Global Challenge against Tropical Diseases

DATO' DR HASSAN ABDUL RAHMAN
Director General of Health

Dato' Dr Hassan Abdul Rahman mentioned that tropical diseases are major global causes of morbidity and mortality, especially in developing countries. Although significant improvement was been achieved in controlling malaria through concerted global effort, the control programme was still fragile with reported resurgence in some countries. Development of multi-drugs resistant strain and lack of alternative effective anti-malaria drug was also a cause of concern. Dengue was rapidly spreading with more and more regions experiencing severe and explosive outbreaks. Dengue control was being challenged by efficient vector and lack of effective control tools. There is a promising prospect of an effective vaccine but would not be available as yet in the near future. Tuberculosis is only declining slowly globally and the prolonged treatment regimen and multidrug resistant are challenges to effective public health measures to control the infection. Other neglected tropical diseases such as lymphatic filariasis, schistosomiasis and leishmaniasis also contributed significantly to disease burden in certain regions of the world. In positioning Malaysia in the global tropical disease research, there is a need to examine three critical areas namely research funding, human resource and critical mass in tropical diseases (the software), and research infrastructures and facilities (the hardware). Overall, Malaysia's R&D expenditure at 0.6% of GDP is comparatively low compared to other newly emerging economies. Similarly, research personnel indices (17.9 per 10 000 labour force and FTE of 9694) are also low. Although research infrastructures might be adequate, complete inventory of facilities and research agenda were not available, compromising the already limited resources and missing the opportunities for productive collaboration and networking. There are already established international linkages which could be capitalised to put Malaysia in the global map of tropical diseases. These include the Drug for Neglected Diseases Initiative, membership in TDR Governing Board, SEAMEO-TROPMED Network and WHO Collaborating Centres. There is a need to work towards a policy statement and framework of actions on tropical diseases in order to position Malaysia against global burden of tropical diseases.

Tropical Diseases in Malaysia: Situational Analysis

DR LOKMAN HAKIM SULAIMAN
Ministry of Health

Dr Lokman emphasized on dengue epidemiology, malaria with reference to Plasmodium knowlesi, tuberculosis situation in Malaysia and the epidemiology of leptospirosis in Malaysia. He also discussed on the top five fields of research: agriculture, engineering, medical health,

applied sciences and material sciences, respectively. About funding for research and limiting factors for researchers, Malaysia was far behind as compared to China and India for expenditure in research. Besides, the numbers of researchers have also been declining and this trend was disturbing. There was a significant reduction in human resources for R&D from 2004 to 2006. He mentioned that more than 90% of the funding for R&D was from the government. He emphasized on the importance of basic and fundamental science. Dr Lokman mentioned that for publications on tropical diseases in indexed journals such as *PubMed*, *Science Direct* and *Medline*, Malaysia contributed 4.61% for dengue related studies and approximately 1.11%, 1.17% and 0.72% for reports on malaria, leptospirosis and tuberculosis, respectively. To increase interest of research in Malaysia, RM2.7 billion was allocated in the RMK10 Human Resources Plan to promote post-graduate studies through three sponsorship programmes; *myMaster, myPhD* and industrial PhD which targeted to produce 5000 graduates by 2015. This would also complement the Higher Academic Training Scheme which targeted 18 500 graduates by the year 2015. According to Dr Lokman, the way forward for R&D in Malaysia was to invest in infrastructure.

Q&A Session

Prof Emeritus Dato' C.P. Ramachandran asked if the 5000 to 7000 cases of malaria reported in Sabah/Sarawak or Peninsular Malaysia. With regards to leptospirosis, he enquired whether the lack of proper diagnosis was the cause of death.

Dr Lokman mentioned that Sabah and Sarawak were the major contributors to malaria in the country. However he mentioned that there were also fatal cases of malaria in Peninsular Malaysia despite the fact that better access to proper healthcare was available compared to those living in Sabah and Sarawak. With regards to leptospirosis, there were many contributing factors of fatal cases. Granted that a proper diagnosis for leptospirosis was yet to be established, he mentioned that diagnosis could be the main reason for deaths. He added that diagnosis for leptospirosis was still complicated as it was however required for the samples to be sent to reference laboratories.

Prof Norhayati Mokhtar from UKM mentioned that research on the basic and fundamental science was still needed to be highlighted in the country. On the other hand, universities were targeting applied research that could be commercialized and patented as more grants were given. She asked for comments.

Dr Lokman mentioned that the 5th and 6th Malaysian Plan was focused to develop the R&D capacity in the country and at that time there was no issue of commercialization. Malaysia had invested a lot on basic research and now it was time to reap the fruits of the investment. He mentioned that basic and fundamental research was still important presently and if one wanted to be innovative and be recognized, one had to start with basic fundamental research. Otherwise it would be like riding on people's boat.

Current Research Activities and Future Plans in Tropical Diseases

DR LEE HAN LIM
Institute for Medical Research

Dr Lee Han Lim briefed the audience on the history of IMR and mentioned that IMR's research focus was presently on tropical diseases, natural product discoveries, stem cell, cancer and the other centres on specific research which involved allergy and immunology, environmental health, diabetes and metabolic syndrome. With regards to dengue vector control research, IMR was in collaboration with Oxitec Ltd (which is a spinoff company of Oxford University) to field test transgenic mosquitoes by releasing it into the environment. Besides transforming *Aedes aegypti*, RIDL *Aedes albopictus* would also be developed shortly. Besides that, IMR had also introduced biocontrol agent, *Bacillus thuringiensis israelensis* (Bti) and the IMR autocidal gravidtrap, for which patent application was filed. Research work was also carried out to isolate *Aedes sex* pheromones which would be useful for trapping adult mosquitoes. In terms of diagnostics for dengue, biomarkers for dengue as prognostic markers for severe dengue was developed. Studies on arbovirus with special reference to dengue and chikungunya have highlighted the possibility of sylvatic cycle of chikungunya virus in monkey, as similarly found in dengue since chikungunya virus had been isolated in monkey. Newer diagnostic methods and reagents for dengue, chikungunya and JE were also in the pipeline. For the control of malaria vectors, long lasting residual spraying was tested and was found that indoor residual spraying could be applied only once a year. Further to this, GIS mapping of malaria risk areas in aboriginal settlement in Kuala Lipis Pahang was also constructed. On drug discoveries for neglected tropical diseases (NTD), there was an initiative at the IMR for diseases such as malaria and filariasis. Work on natural product was conducted on *Carica papaya* leave juice for the treatment of dengue. IMR also had collaborations with Karolinska Institute to develop phytoceuticals from *Kacip Fatimah* and this technology was patented. In tuberculosis, a chip based on microarray assay for tuberculosis detection was developed and filed for patent. Some current research on leptospirosis was also highlighted by Dr Lee. He also reviewed the financial grants for research and the number of research projects, patents and commercialized products which were developed by IMR.

The way forward and the future plans of IMR was to focus on climate change and its effect on the assessment and adaptation strategies for vector-borne diseases (Dengue, Chikungunya, Malaria), other tropical diseases (Tuberculosis and Leptospirosis), pollution and impact on health. He also emphasized on dengue research directions. He mentioned that the focus was now on the development of drug against dengue, the establishment of a centre of excellence on NTD, innovation of vaccine and biotechnology through Natural Products Discovery, stem cells, cancer (breast and nasopharyngeal) and centre-specific research (allergy and immunology, environmental health and diabetes and metabolic syndromes). IMR was also involved in several collaborations (international and national levels).

Comment

Prof Emeritus Dato' C.P. Ramachandran: Could Malaysia by itself help towards the control of dengue because dengue has become a regional problem in all ASEAN countries? He asked if there was any attempt to get everybody involved in this region to work together rather than working separately because the strategic plans for dengue control by WHO was to get every country in this region to work together. He enquired on the focus in the next 10–15 years in Malaysian research and development and other concerns that IMR ought to implement. IMR is the major national research institution contributing to tropical diseases and its directions set the pace for others to follow. He also mentioned that there were very few research training centres today that were training parasitologists and medical entomologists, and IMR has played a major role for the past 30 years or more in doing so and still continuing to do so. In this region, many of the current entomologists and parasitologists employed by the MOH were trained under IMR. However, the numbers of entomologists and parasitologists were decreasing. Currently, many students do not take up applied parasitology and entomology courses. Prof Ramachandran also added that there was a need for the molecular aspects of the diseases to be looked into, understanding of ecological aspects of these diseases should not be disregarded.

Q&A Session

Prof Dr Johari Surin: What is the possibility of applying fungi spores against mosquitoes like anopheles as done in other countries? Is it possible for dengue, and well as a biological control agent?

Dr Lee mentioned that biological control agent comprised the predator, the parasite and the pathogen. Fungus was known as the pathogen for the mosquito and the only successful stories were related to BTI. However, fungi have its own problems (i.e. mass production, shelve life, dosage and application method). There are many examples for biocontrol agents (i.e. fish) but there are so many other factors which limit the use of such control agents.

Dr Tang Thean Hock (USM): Of all the kits that have been developed by IMR, how many has reached the grounds of general hospitals and district hospitals of the country, and have they really benefited the people?

Dr Lee mentioned that there were a few kits that have been commercialized and some were basically meant for in-house testing. IMR was in the process of commercializing some of these products. Presently, only Agensi Inovasi Malaysia was given the task to commercialize the product developed by research institutions and universities. Many of these would go through commercialization before being used in hospitals. IMR being a research institute was therefore is not capable in handling the commercialization process. Companies which are capable of producing these kits in large numbers are needed. Dr Lee stressed that commercialization was not about generating money but how IMR could fully utilize findings and convey them to the end users. In conclusion, IMR have yet to mass produce and commercialize their products for use in hospitals.

Member of the audience : To what extent is IMR committed to the partnership with DNDi in their fight against malaria, leishmaniasis and chagas disease?

IMR is currently conducting *in-vitro* and *in-vivo* screening of drugs for NTD especially filiarisis and malaria. However, it was not involved in screening drugs for diseases not found in Malaysia.

Current Research Activities and Future Plans in Tropical Diseases

ASSOCIATE PROF DR JAMAL I-CHING SAM
University of Malaya

Assoc. Prof Dr Jamal briefed on the role of Tropical Infectious Diseases Research and Education Centre (TIDREC), Department of Microbiology, UM, in advancing knowledge in tropical infectious diseases in Malaysia. This centre focuses on research in neglected and emerging tropical infectious diseases that have significant impact on the global community. TIDREC also serves as a focal point for collaborative research efforts in tropical infectious diseases. Research areas that the centre is focusing on are: (1) dengue and arboviruses; (2) bacterial and fungal research; (3) influenza and other respiratory viruses and (4) nipah virus and highly virulent pathogens. They have international and local collaborators and world class facilities (BSL-2 Bacteriology, mycology and virology laboratories and a certified modular BSL-3 laboratory). Besides TIDREC, research on tropical diseases is also actively carried out by the Department of Parasitology, Faculty of Medicine, UM. Diseases and research areas of interest include toxoplasmosis, malaria (i.e. *Plasmodium knowlesi*), water-borne parasitic infections (*Blastocystis*, *Cryptosporidium*, *Giardia*, free-living amoeba), filariasis, soil-transmitted helminthiasis and entomology (i.e. mosquitos, spiders). Research aspects that are actively studied for each of these diseases/infections include epidemiology, genomics, diagnostics, structural biology, pathogenesis and screening for potential natural product. The current total for 21 research grants amounted to approximately RM1.7 million. The Department of Parasitology has published 42 ISI publications between 2009–2010 and is in collaboration with Mahidol University and Prince of Songkhla University, Thailand, and Cornell University, USA. He mentioned that, in terms of future plans, they would continue to expand their current research and on issues that they were facing presently. The two major issues that were affecting R&D in UM are funding and human resources. He felt that one should look for more international funding. He mentioned that from experience, getting grants from international body was possible particularly if the diseases are of importance. Secondly, there was a difficulty in finding dedicated staff and students for research.

Q&A Session

Prof Emeritus Dato' C.P. Ramachandran: What are the specific areas of research on tropical diseases? What are the types of research being conducted in the Department of Parasitology?

Assoc Prof Dr Jamal explained that the Department of Parasitology, UM, was actively working on the epidemiology, diagnostics, pathogenesis, entomology and forensic entomology aspects. Assoc. Prof Dr Yvonne added that researchers were also looking into elucidating zoonotic transmission of some of the parasitic diseases. Besides malaria, they also had soil-transmitted helminthiasis (STH). One area of STH that UM could contribute was in assisting MOH in establishing a database for soil-transmitted helminthiasis. Presently, national data on STH was scanty and sporadic. Currently, researchers at the Department of Parasitology, UM, were conducting on-going field trips to gather data as well as to collate previous available data from relevant agencies. With a comprehensive baseline data, areas of research could be further identified and a roadmap formulated. In terms of *Plasmodium knowlesi*, a rapid, cost-effective, less labor-intensive, and convenient single step multiplex PCR assay which could simultaneously identify all five Plasmodium species infecting human, including *P. knowlesi*, was established. Besides that, development of other diagnostic methods were also in the pipeline.

David Baguma: To what extent has your work been translated into actual practise to help and support the basic necessities of hospitals in Malaysia and other developing countries?

In diagnostics, a few kits which were established, have been used in the University Malaya Medical Centre (UMMC). Some of the newly developed kits were also used to aid UMMC. Some of the epidemiology, molecular epidemiology or pathogenesis work was more for basic fundamental knowledge and applications are something which might occur later on. About clinical epidemiology, data is utilised in talks and presentations to doctors. Most of the translation work was confined within UMMC.

Dr Lim Boo Liat: Stating his interest in bats and nipah virus, he asked "What is the current research done on Nipah virus? As it is known, Nipah virus is carried by fruit-eating bats; has any work been done on insect-eating bats?

Currently, there are researchers working on epidemiology and UPM is doing some work on the proteomic of Nipah virus. The lack of biosafety level 4 facilities in the country limits researchers from studying this virus further.

R&D on the Development of Diagnostics for Tropical Parasitic Diseases

PROF RAHMAH NOORDIN
Universiti Sains Malaysia

Prof Rahmah Noordin briefed the participants on INFORMM which is a translational research institute at USM. The main focus of this Institute is on 'Diagnostics'. It has gained the recognition as one of MOHE's centres of excellence (HiCOE) on diagnostic platforms. Parasitic Disease Cluster is one of the main research clusters at INFORMM. Among the parasitic diseases that are being studied are: lymphatic filariasis, toxocariasis, amoebiasis (extraintestinal), strongyloidiasis, common intestinal parasites, toxoplasmosis and echinococcosis. USM produced two rapid kits which detects *B. malayi* and *B. timori* and all species of lymphatic filariasis. It has the sensitivity of 94%–100% and a specificity of 99%–100%. These kits were recognized by WHO for Global Programme to Eliminate Lymphatic Filariasis (GPELF) in *Brugian filariasis* endemic areas. For amoebiasis, proteomic studies on proteins in pus and serum from patients with ALA (in collaboration with Academia SINICA, Taiwan) were being carried out. From this study, three proteins of potential diagnostic importance were identified and patent application was being filed. USM was working towards development of an antigen detection test to identify *Brugia malayi* proteins in serum of brugian filariasis patients using proteomics approach (2-DE & mass-spectrometry) and to create a Brugia-specific phage antibody library. A pentaplex PCR for four common soil-transmitted helminthes were developed and reported. According to Prof Rahmah, Malaysia is in need of a national centre for the evaluation and validation of diagnostic tests to verify their sensitivity and specificity for national usage. A similar closed cycle concept available in Cuba enabled well-validated tests developed by local scientists to be used within the country. Prof Rahman also stressed for more grants for prototype development of neglected tropical diseases.

Comments

Dr Lokman commented on the proposal on the national centre for evaluation and validation of diagnostic test; IMR is the national evaluation centre for MOH facilities. At the end of the day, the main consumer in this country is the MOH. If the kit is evaluated by IMR, it will be used by the whole country. He mentioned that procurement would still follow the standard government procedures because there is already a policy on "Buy Malaysian First". However, the price must be competitive. The policy gives priority to Malaysian products but Malaysians must be competitive.

Prof Emeritus Dato' C.P. Ramachandran wanted to answer the question on lack of resources. He felt that this was not true as the Malaysian government was putting a lot of money in R&D. Furthermore, several external funding were also available from various sources. Malaysian researchers cannot depend entirely on our national resources; there is a need to compete for external funding. Currently, there are many groups funding research on tropical diseases. Malaysians need to be more competitive in order to receive these funding.

Prof Johari Surin from UM commented that if the government thinks that diagnostic kits are able to generate vast amount of revenue, this might not fulfill the government's vision; as diagnostic kits in tropical diseases are not money generating for the consumer market is not large.

Dr Zainuddin from USM mentioned that although IMR was the designated centre for testing and evaluation, however, the reality was otherwise. The message does not transpire to the institutions. National evaluation did not have a well organized approach whereby there was no systematic way for the developers to endorse their product to be used by the country.

Current Research Activities and Future Plans in Tropical Diseases

PROF NORLIJAH OTHMAN
Universiti Putra Malaysia

Prof Norlijah introduced the Faculty of Medicine and Health Sciences. She said that UPM had already produced its 10th batch of medical students. She mentioned that the research in tropical diseases in Universiti Putra Malaysia was mainly contributed both by the Faculty of Medicine and Health Sciences (FMHS) and Faculty of Veterinary while for the FMHS, research was mainly contributed by preclinical lecturers in the Parasitology Department ranging between 10–25 years of experience which was led by Prof Wan Omar. Looking at the research activities of parasitology and tropical diseases, it involved a small group of researchers. The research areas emphasized by the Faculty are malaria, toxoplasmosis, filariasis, dengue, tuberculosis, intestinal infections and leptospirosis. In the area of toxoplasmosis, they focused on these three aspects: (1) sero-epidemiology of toxoplasmosis in Malaysia where the prevalence of antigenemia among various occupational groups was studied; (2) serological diagnosis of IgM and IgG toxoplasmosis using IFA test, ELISA and Dot-ELISA procedures and (3) development of a vaccine based on recombinant SAG1 from fatal toxoplasmosis. Prof Norlijah mentioned that the faculty currently received 118 funds from E-Science Fund, FGRS, RUGS and other resources with the total amount of RM32 052 968 where RM934 000 was allocated for research in tropical biomedicine. The faculty was looking towards re-identification and re-strategizing to involve the clinicians in their niche areas, to have interfaculty networking, local and overseas collaboration and to provide training and attachment courses to enhance intellectual property output.

Comments

Prof Emeritus Dato' C.P. Ramachandran commented that UPM had the research strength of the Veterinary Faculty. Veterinary Faculty should be able to help and work together with the Medical Faculty to look at the new and re-emerging tropical diseases which are basically zoonotic in origin.

Plasmodium knowlesi: Past, Present and Future

PROF BALBIR SINGH
Universiti Malaysia Sarawak

Prof Balbir Singh briefed the audience on an ancient simian malaria parasite which was presently re-emerging and was known to infect man in nature. He also mentioned that this was not a new parasite and naturally acquired *P. knowlesi* infections in man that have been reported since 1965 in Pahang, Malaysia. He talked about his study done in 2004 which reported a large number of naturally acquired cases of knowlesi malaria infection in Kapit, Sarawak and this report was published in *Lancet* 2004. He mentioned that knowlesi transmission to man via blood injection was reported in 1931. However, there were no report on human-to-human infections via mosquito bites. He also mentioned that macaques colonized Asia since more than 5 million years ago while the knowlesi malaria existed since 98 000 – 478 000 years ago. He stated that the CSP alleles and the mitochondrial haplotypes are shared between monkeys and humans. However, there were no mitochondrial DNA lineages associated with either host. He mentioned that their current research was on the characterization of parasite and host determinants of severe knowlesi malaria, the epidemiology of *Plasmodium knowlesi* and other malaria parasites in Malaysian Borneo, human *Plasmodium knowlesi* diagnostics and clinical outcome. Recommendation following WHO informal consultation on *P. knowlesi*, in February 2011 was that in areas where knowlesi malaria was confirmed, all cases diagnosed as *P. malariae* by microscopy was reported as *P. malariae / P. knowlesi*. Prof Balbir mentioned that the future of *P. knowlesi* depended on changes in ecology (logging), vector behaviour and the increase in human population whereby *P. knowlesi* might then prefer humans as host, compared to macaques as previously preferred.

Comments

Prof Balbir Singh mentioned that funding from Malaysia was micro-managed with wastage of time writting reports. He proposed a policy change. He recommended that post-doctorate students be given an opportunity for a permanent post. He also stressed that paper work should be reduced. At the end of the day, there would be benefits to the people. Scientists are presently trying to rush to fulfil KPIs and that these requirements were ridiculous. A grant for three years required 50 publications! It takes about 4 years to really train someone. Even the Wellcome Trust in Thailand was not producing 50 publications. Instead there should be only one or two good publications in good journals. The good researchers are bogged down with KPIs, administrative work and others, and the output turn out to be of no quality.

Tropical Diseases: The Zoonotic Connection

DR M. RAMLAN
Veterinary Research Institute

The Veterinary Research Institute (VRI) of Malaysia carries the mission to support the growth of animal industry by providing diagnostic, research, advisory and monitory services. The major focus of VRI in R&D in tropical diseases is on zoonotic diseases such as brucellosis, salmonellosis, melioidosis, leptospirosis, nipah, avian and swine influenza, Japanese encephalitis and rabies. In 2010, five major zoonotic-related research projects were carried out by VRI team focusing on avian and swine influenza, brucella, leptospirosis and H5N1 influenza virus. VRI also plays a role in reporting notifiable diseases for the headquarter compilation to OIE reference laboratory for the region.

Q&A Session

Prof Emeritus Dato C.P. Ramachandran: In the last slide, it is indicated that there is no early warning system for detection of zoonotic diseases. Why is it said so, even with the well established infrastructure in VRI?

Dr Ramlan replied that at VRI, there was no proper epidemiological data/surveillance system for the lifestock industry.

Comments

Prof Emeritus Dato' C.P. Ramachandran mentioned that it was critical to have an indicator/ monitoring system for some of the emerging zoonotic infections. There was a need to find a mechanism to create a proper surveillance system.

Current Research Activities and Future Plans in Tropical Diseases

ASSOC. PROF DR PATRICIA LIM KIM CHOOI
International Medical University

The International Medical University gained university status in 1998. Since then, emphasis has been given to research. The number of research projects, be it internal or external have increased gradually from 2000–2010. In 2010, approximately 140 internal projects and 10 external projects were carried out. The current research studies in tropical diseases in IMU revolves around systemic fungal infections using immunoassays and rodent model, molecular characterisation of acanthamoeba, bioactive compounds in Bacillus thuringiensis, house dust-

mite allergies and typhoid. Apart from these, studies in human subjects are also being done to investigate parasitic infections in acute appendices, prevalence of intestinal helminthiasis, filiarisis and malaria as well as some bacterial pathogens. In future, IMU aims to focus on environmental pathogen related to human health, development of better diagnostic test for selected tropical diseases and tropical infections of oral cavity.

Comments

Prof Dr Mak Joon Wah: A lot of emphasis needs to be given for field research as we have been doing laboratory based research most of the time. The area of interest should focus on hospital infections, tuberculosis and acanthamoeba infections.

Prof Emeritus Dato C.P. Ramachandran: Agreed with Prof Dr. Mak's remark. Research on pulmonary tuberculosis should be highlighted as there is no proper diagnostic tool to date.

Global Situation and Future Research in Tropical Diseases

DR CORRINE CAPUANO
World Health Organization

Dr Corrine Capuano the WHO representative for Brunei Darussalam, Malaysia and Singapore discussed on the global situation and future research in tropical diseases focusing on neglected tropical diseases. The overall goal of WHO, where tropical disease is of concern, is to reduce burden due to communicable diseases/eliminate where feasible based on evidence from research. The regional goal is to harness science, technology and broader knowledge in order to produce research-based evidence and tools to reduce the burden or eliminate where feasible, infectious diseases due to poverty in the Western Pacific Region. It was stated that among the neglected tropical diseases such as protozoan infections which includes leishmaniasis and Chagas disease, helminthiasis, elephantiasis, onchocerciasis, schistosomiasis, dracunculiasis, viral infections such as dengue and dengue haemorrhagic fever and bacterial infections such as leprosy, trachoma, buruli ulcer and rabies. WHO also reported that the majority of NTDs occur in low-income group people. The progress done so far in this area are capacity-building through small scale research grants, strategy development through collaboration on multi-diseases and, multi-sectoral intervention for NTDs, information sharing via website update and resource mobilization by giving postgraduate scholarships and funds.

Panel Discussion

Tropical Diseases — The Way Forward

Dr Lee Han Lim
He explained that IMR's role is in assisting MOH in improving public health in controlling and eliminating diseases. He stressed that IMR and universities have different needs and aims to be accomplished in the research on tropical diseases. Granted that some diseases are nearing elimination such as malaria, he reckoned that resources should be diverted to other diseases that are critical especially where no effective treatment is available. In addition, it is also important that diseases with high morbidity such as soil-transmitted helminthiasis should be targeted as the knowledge of disease burden of these infections is crucial in formulating effective control and preventive measures. Lastly, he emphasized that there should be efforts into identifying innovative research if we were to propel tropical diseases research to greater heights.

Prof Mak Joon Wah
Prof Mak emphasized on good leadership to spearhead tropical diseases research. Funds for Tropical diseases research should also be channelled to appropriate people and appropriate projects. He also suggested to harness expertise and capabilities not only from public universities but also to be inclusive of private universities. To further enhance clinical research, medical doctors need to be trained to conduct good clinical research.

Assoc. Prof Dr Jamal I-Ching Sam
Dr Jamal mentioned that the human resources support in terms of staff and students are crucial for research to be successful. He also said that good dedicated students with keen interest in research is lacking. Currently, the remuneration for research assistant is very low. There should also be an appropriate and effective utilization of available expertise and current resources. Policy-makers should make decisions reflecting on happenings that are on the ground.

Prof Rahmah Noordin
Prof Rahman observed that universities were competing with each other rather than working together. One of the contributing factors to the competition could be the requirement of the key performing indices (KPIs). A more positive culture of working together should be inculcated. Another point that she highlighted was the need to have more post-doctoral candidates.

Prof Balbir Singh
Prof Balbir noted that there was more emphasis on applied research such as product-based research resulting in lower priority for fundamental and basic research. The country he said, was in dire need of more taxonomists and experts in biodiversity. This was made worse with less funding for field work. Researchers should also be allowed to have more flexibility in conducting their research. The lack of proficiency in English among students was also a limiting factor. He stressed that healthy competition among universities was good; however realistic KPIs should be in place. Implementation of research policies should be transparent and funds should be dispersed based on merits (track record) of the investigators.

Dr Ramlan Mohamed
Dr Ramlan proposed that a proper career development path for VRI staff should be formulated. He also encouraged collaborating universities to acknowledge the contribution of VRI in their research outcomes and publications.

Dr Corrine Capuano
Dr Corrine suggested for the establishment of a national agenda on tropical diseases research for Malaysia with regular consultation. Malaysian researchers should outline how WHO could assist and vice versa and the means researchers could assist WHO into combating tropical diseases. In short, she emphasized on the importance of a roadmap for tropical diseases.

CONCLUDING REMARKS

Prof Dato' Dr C.P. concluded the one-day Forum on the status of R&D in tropical diseases by emphasizing that the success of tropical diseases research should be by enhancing inter- and intra-collaborations between research institutions and universities. By advocating such collaboration, research output will be of high standards and quality and this will further reduce the duplication and repetition of research projects.

A number of recommendations to enhance research in tropical diseases were proposed:

1) Development of Human Resource

2) Training of researchers (mentoring)

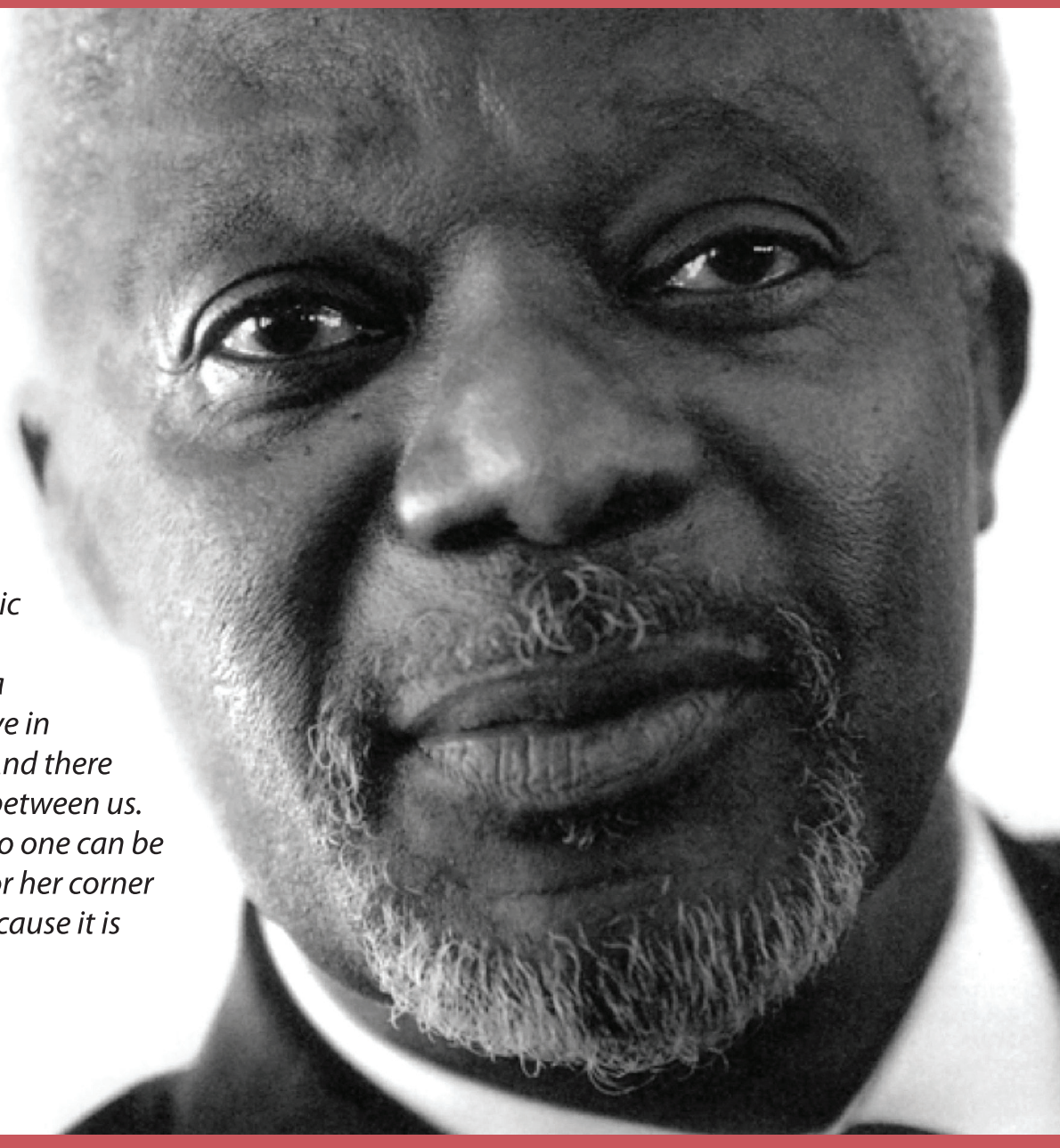
3) Create task force/ advisory role to sustain interest in tropical disease

4) Infrastructure — available reasonably. (Prof Rahmah – Need for a national centre for the evaluation and validation of diagnostic tests to verify their sensitivity and specificity for national usage)

5) Funding — distribution of funds should be even; and

6) Research policy — national agenda on neglected tropical diseases research through enhancing inter- and intra-collaborations between research institutions and the universities and enlarging the scope, particularly in the field of epidemiology, neglected tropical diseases and surveillance system.

FROM CONCEPT TO COLLECTIVE ACTION



"THERE ARE NO ISLANDS in the world today, and there are no domestic and international diseases. We live in a global village. We live in a shrinking world. And there are many contacts between us. No one is isolated, no one can be smug and sit in his or her corner and say, 'I'm safe because it is somewhere else.'"

Kofi Annan,
Former Secretary-General
of the United Nations

AKADEMI SAINS MALAYSIA

ACADEMY OF SCIENCES MALAYSIA
902-4, Jalan Tun Ismail, 50480 Kuala Lumpur
Tel: +603-2694 9898 Fax: +603-2694 5858
E-mail: publication@akademisains.gov.my
http://www.akademisains.gov.my

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