Abstracts

Session 2
RSTMH Symposium

S2.1 Challenges facing tropical medicine: 1907, 1957 and 2007

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In 1907 the British Empire embraced parts of the world where exotic diseases presented threats to the well-being of the indigenous peoples, expatriate civil servants, traders and military personnel. But this was a time of great optimism, the causes of many tropical diseases had been unravelled and drugs and vaccines were becoming available for their control. Schools of tropical medicine had been established and specialist laboratories had been built in tropical countries. The challenge appeared to be merely the application of knowledge and the coordination of measures to alleviate diseases. Against this background, the Society of Tropical Medicine was formed to advance the cause of tropical medicine. By 1957 the era of empires had ended, dependence had turned to cooperation and many of the poorer newly independent countries looked to wealthier countries for help which was willingly forthcoming. This too was a period of great optimism, DDT was available to control insect-borne diseases and it even became possible to contemplate the global eradication of malaria. Now in 2007 much of the optimism voiced in 1907 and 1957 is muted. Considerable progress has been made, smallpox has been eradicated, poliomyelitis is nearing eradication as are dracunculiasis, lymphatic filariasis and onchocerciasis. However many of deep-seated challenges remain and new ones have emerged. Biotechnology might seem to provide some of the solutions but it would be wise to look back at what our predecessors in 1907 and 1957 were thinking and to remember that they too thought that they had all the answers.

S2.2 Malaria situation: research on new antimalarial drugs and management of malaria

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At the Bangkok Hospital for Tropical Diseases, clinical trials on new fix artemisinin combination therapy (ACT), such as Artekin® (dihydroartemisinin + piperaquine), Pyramax® (pyronaridine + artesunate) and fix combination of artesunate + mefloquine have been studied. Results show they could be ideal antimalarial drugs for use in the near future. Currently, the treatment for uncomplicated malaria is aimed at producing a radical cure using the combination of either **(1)** artesunate (4 mg/kg/day) plus mefloquine (8 mg/kg/day) for 3 days;**(2)** a fixed dose of artemether and lumefantrine (20/120 mg tablet) named Coartem® (4 tablets twice a day for three days for adults weighing more than 35 kg); **(3)** quinine 10 mg/kg 8-hourly plus tetracycline 250 mg 6-hourly for 7 days (or doxycycline 200 mg once a day for 7 days as an alternative to tetracycline) in patients aged 8 years and over; and **(4)** a combination of atovaquone and proguanil called Malarone® (in adult, 4 tablets given daily × 3 days). In treating severe malaria, drugs included intravenous quinine or a parenteral form of an artemisinin derivative. A recent study from multi-center trials proved that artesunate i.v. is better than quinine i.v. and the recommended dose is artesunate 2.4 mg/kg i.v. at 0, 12, 24 hour then daily for 7 days. The treatment of vivax malaria in Thailand is still using chloroquine and primaquine. However, if ineffective to primaquine (relapse rate of 15%) the higher dose (22.5-30 mg/kg/day for 14 days) is recommended. The efficacy studies of high dose primaquine (30 mg/d)and new drugs like Tefenoquine® and Bulaquine® are undergoing clinical trials.

S2.3 Cost effective drug development in response to the neglected disease crisis

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Over the past 30 years, the amount of R&D effort in neglected diseases, both by private industry and public bodies, steadily shrunk until the problem became a crisis. Private industry disengaged from tropical disease R&D, and support from national governments, especially in the north, waned. A radical change occurred in the late 1990's with a reawakening of interest in the field and a significant injection of money, led by donations from the Bill and Melinda Gates Foundation, so that today the level of funding is at unprecedented levels. Despite this, the level of engagement remains low, and is largely driven by the Public Private Partnerships (PPPs) such as the Medicines for Malaria Partnership (MMV), the Drugs for Neglected Diseases Initiative (DNDi) and several others. It appears that the main block on a major expansion of R&D for neglected diseases is the cost of development which has been steadily rising year on year. The current industry estimate of development costs for bringing a single drug to market now exceeds $800million but this includes many hidden costs. Realistically, the true cost of development may be as little as $20 million, depending on how one looks at the figures. This paper will examine some of the issues and fallacies associated with such development and suggest ways that the problem can be solved to the benefit of all involved.

S2.4 Challenges of parasitic disease control in sub-Saharan Africa

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The burden of parasitic diseases in Africa remain very high. Several attempts at control have not yielded the desired results in many countries. The challenges of implementing disease control and elimination programmes remain daunting but not insurmountable. Some of the reasons assigned to the little success include: Inadequate commitment by national ministries of health to disease control and elimination. Uncoordinated and fragmented disease control strategies. The skewed distribution of international and national resources towards the control Malaria, HIV/AIDS and tuberculosis. Inadequate human resource. The success stories of the Onchocerciasis Control Programme shows that where there is commitment and concerted efforts, it is possible to eliminate some diseases as a public health problem. The initial gains of the Lymphatic Filariasis go to confirm this; however in the light of limited international funding, there is the need to re-think disease control in Africa. Indeed "integration of disease control programmes" has in recent times become a buzz-phrase with little explanation of what it really means. This paper discusses the success of disease control in sub-Saharan Africa and looks at the challenges of this new era of limited funding and re-defined global strategies focusing on integration and "neglected tropical diseases", and makes suggestions on how we may improve and sustain disease control in sub-Saharan Africa.

S2.5 The Global Programme to Eliminate Lymphatic Filariasis – *"It takes a community to raise a programme"*

Eric A. Ottesen

Building on remarkable scientific discoveries, on extraordinary drug donations from GlaxoSmithKline and Merck & Co., Inc., on early financial support from the United Kingdom and Japan, and on initial grants from the Arab Fund and the Gates Foundation, the Global Programme to Eliminate Lymphatic Filariasis (GPELF) was created in 2000 with the goal of meeting the challenge of World Health Assembly Resolution 50.29: to eliminate lymphatic filariasis as a public health problem worldwide. The principal strategy to achieve this goal is to deliver once-yearly, single-dose, 2-drug treatment to all individuals in 'at risk' populations, thereby reducing transmission of LF to levels below which even after ceasing interventions, there is no risk of recurrence. Since 2000 the GPELF has experienced an unparalleled rate of growth, now having active programs in 46 countries that target treatment of more than 500 million people annually. Careful monitoring has provided proof that this Programme strategy to reduce LF transmission is highly effective, and because LF programmes are both cost-effective and have easily recognized immediate and long-term health benefits, they are so popular that national governments have increasingly taken responsibility for their principal financial support. However, especially in African countries, needs augmentation from the international community – a challenge increasingly being met particularly by the U.S., U.K. and Japanese governments which recognize not only the enormous burden that LF and other Neglected Tropical Diseases impose on the world's most underserved populations but also the extraordinary, cost-effective opportunities being provided by the public-private partnerships dedicated to addressing them.

S2.6 Travel medicine: giving the correct advice to travellers

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Travel medicine is emerging as a new multidisciplinary specialty area catering for an increasing number of travellers worldwide. Travel health advisers are engaged in the provision of pre-travel health advice, chemoprophylaxis against travel-related diseases, traveller's medical kits, and post-travel assessments and eradication treatment for various travel-related diseases. They are also in a key position to liaise with public health authorities on possible imported disease risks. In terms of risk assessment and provision of preventive measures, vector borne diseases, in particular malaria, influenza and the arboviral diseases, stand out as major concerns for travellers; however common problems, such as travellers' diarrhoea and respiratory tract infection, also need to be addressed. In terms of giving the correct advice to travellers, travel health advice needs information, training, and experience, as well as detailed risk assessments to be undertaken for each traveller. It also needs to be documented and needs travellers to seek pre-travel health advice. Travel and aviation medicine have many linkages, especially in terms of fitness to fly and dealing with problems that may arise in travellers due to physiological and psychological stresses of travel. In the face of recent terrorism and conflict, travel advisories have assumed great importance in travellers planning. Travel insurance remains an important safety net for travellers, which provides coverage for medical and dental treatment abroad as well as an emergency assistance service, which may include aeromedical evacuation.

S2.7 Malaria, monkeys, man and Malaysia

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Plasmodium knowlesi was first isolated in India from a long-tailed macaque monkey imported from Singapore in 1931. *P. knowlesi* was known to be infectious to humans by blood passage since then, but naturally acquired human knowlesi malaria infections were thought to be rare as only 2 cases had been reported, both in Peninsular Malaysia. However, using molecular detection methods we discovered a large focus of human infections in the Kapit Division of Sarawak. Subsequent studies have shown that human *P. knowlesi* infections are not confined to the Kapit Division as over 400 human knowlesi cases have been detected from 30 locations studied in Sarawak and Sabah in Malaysian Borneo, and Pahang in Peninsular Malaysia. *Anopheles latens*, which feeds outdoors on man and monkeys, has been incriminated as the vector for knowlesi malaria in Kapit. A zoonotic source of human infections in Sarawak was confirmed by our findings that 19 (52.8%) of 36 wild long-tailed and pig-tailed macaque monkeys from Kapit were infected with *P. knowlesi*. The *P. knowlesi* small subunit ribosomal RNA and circumsporozoite genes from monkey blood samples were phylogenetically indistinguishable from *P. knowlesi* isolates from humans and mosquitoes. Although genotypically diverse, certain genotypes were shared between human, mosquito and monkey hosts. The epidemiological, molecular and entomological data strongly suggest that knowlesi malaria is a zoonosis and monkeys are the reservoir hosts. Recent reports of human knowlesi malaria cases in Burma and Thailand indicate that human knowlesi infections are probably distributed in areas in Southeast Asia inhabited by macaque monkeys.