

## Re-orienting the Global Health Discussion

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Great effort and commitment is necessary to keep astride with modern medical practice, given its extensiveness and dynamism. In line with this, it often gets bothersome to find suitable fora for discussion. The Journal of Tropical Medicine and Surgery gives us an excellent forum from which we can share experiences, challenges, achievements, and have healthy discussions. This is largely attributed to its broad, yet "well-tailored", scope. "Tropical Medicine", as a discipline, refers to the wide-ranging clinical research, and educational input by chief actors in this field, namely physicians, clinicians, scientists, and surgeons. Typically, it deals solely with diseases occurring in tropical and subtropical regions (Figure 1). This Journal emphasizes the clinical attributes, diagnosis, and treatment of Tropical diseases, in both therapeutic and surgical contexts.

This broad scope is, no doubt, a huge undertaking. Nonetheless, it all makes a lot of sense when viewed in the perspective of certain key themes. These themes are - geographical, climatic, water resources, taxonomic diversity, and economies and income of these regions. It is important that we harmonize the various terminologies used in navigating this area; quite a few terms are interchangeably used, while others are loosely used. Tropical medicine is also sometimes called International medicine. It is a branch of medicine that deals with health problems that occur uniquely, are more widespread, or are indeed more difficult to control in tropical and subtropical regions. Many infections and infestations that are grouped as classical examples of "tropical diseases" were previously endemic in countries located in temperate or even cold areas. Malaria and helminthic (*Strongyloides*) infections are good examples. Many of these conditions have been controlled or even eliminated from developed countries, as a result of improvements in habitation, nutrition, personal hygiene and sanitation. Climate is now not accepted as the main reason for those infections remaining endemic in tropical areas. Some scholars consider calling it a specialty of "Geographic Medicine" or "Third World Medicine"; a term somewhat derogatory [1].

The rapid development of technology has hugely provided the direction and momentum for the development of tropical medicine. Contemporaneously, economic, environmental and social factors lead to variation in the species of pathogens, with infectious diseases becoming more complicated to prevent and treat. These are the real new challenges tropical diseases present currently, and in the future [1]. Well over 2 billion people, representing over a third of the global population, live in the tropics and sub-tropics [2]. In an attempt to bring out the "tropical surgery" contribution to the discourse, it is approximated that 11% of the global burden of disease is surgically treatable [3]. Shortly, we will emphasize the proportion tropical surgery has within this. The World Health Organization (WHO) recognizes the need to expand surgical services to the masses in the developing world though its program, Global Initiative on Essential and Emergency Surgery. The diabolic consequences of trauma have reached almost epidemic proportions in many places. Moreover, trauma remains, largely, poorly treated or is left untreated. In principle and definition, its effective treatment is surgical. Only until the last 2 decades, surgery was considered an expensive luxury for overzealous practitioners. Fortunately, major improvements in health care have been shown to be attainable without exorbitant cost inputs [4]. Evidence to back some

large-scale interventions, sprang out from observations of the impact of dealing with global problems of gastroenteritis, malaria, malnutrition, and, more recently, human immunodeficiency virus (HIV)/AIDS in the tropics. Insecticide spraying limited the advance of malaria, while immunization programs are close to achieving eradication of poliomyelitis from the world scene. Furthermore, many exotic tropical diseases, at one time endemic, have been virtually eliminated. The WHO introduced the important essential drugs program, which has shown high levels of effectiveness. Even the World Bank launched an essential clinical package. This intervention though, has a Caesarean section as the only surgical intervention contained within the entire package. At least, this is still a positive development given that the procedure is the commonest essential surgical procedure worldwide. All this withstanding, it is becoming evident that an essential or basic list of surgical procedures ought to be developed that covers the requirements of 80-90% of essential and emergency cases, particularly in the tropics. A study showed that a highly skilled, senior, and specialized surgeon may find that finesse and knowledge not directly applicable in up to 85% of cases [5]. This, in anyway, does not water-down the role of this surgeon. It only emphasizes the importance of first investing in essential and basic health care.

The global attitude towards surgery is changing. In the context of the discussion, this surgery for the under-resourced people of the world is what we can refer to as "Tropical Surgery"; no better term seems to be forthcoming. Straight away we realize that this is not as clear-cut as tropical medicine. The great thing about it all is that it has steadily been gaining recognition in recent years. But who will direct this new focus on Tropical Surgery? Who will steer its path? Where will be the implementing surgeons for the WHO recommendations? There are interventions like Safe Male Circumcision (SMC) aimed at curtailing incidence of HIV/AIDS. In countries like Uganda, it is being done, not only by surgeons and general practitioners/medical officers, but also by assistant medical officers or clinical officers who have undergone training by surgeons. The impact of this intervention is starting to show benefits. However, is this practice applicable and sustainable in other tropical countries? The answer is, most probably yes. It just has to be tried out.

Training programs in many countries are fixed to old, conservative Western models that cannot suit current needs. The drive towards specialization, and super-specialization, leads to well-qualified experts suited and willing only to practice in amply equipped centers of

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**Figure 1:** Global map showing the Tropical and Sub Tropical regions. The Tropics are “sandwiched” between the Sub Tropics (Yellow shaded areas).

excellence. Moreover, this is often in private practice. This minimizes their contribution to the global surgical need, yet there have been enormous resources invested in their education. Great initiatives aimed at bringing surgeons to rural areas, have been tried, including, surgical camps and specialist outreach clinics [6]. The downside of this is that it creates a top-to-bottom situation, rather than a bottom-to-top one; often with poor acceptability and sustainability. The resulting practice becomes a mix of state-of-the-art surgery for the rich, and practically none for the poor. It takes a global effort, with the corner-stone being the surgical teams in these tropical countries. Strong justification for the joint practice of Tropical Medicine and Tropical Surgery lies in the disparity in life expectancy and quality of life between high- and low-/middle-income countries. Significant differences exist. Fifteen percent of the global population resides in high-income countries, while the rest of the 85% resides in low- and middle-income countries [7]. Three quarters of individuals residing in low and middle-income countries die before the age of 70 years, as compared with 40% of the residents of high-income countries.

We need to spend some time pondering over the global burden of disease, with its inputs from both medical and surgical ailments. Two decades ago, developed regions accounted for close to 12% of the worldwide burden from all causes of death and disability, and took up 90% of health expenditure worldwide [8]. This meant that tropical and subtropical disease (most of developing world falls here), which contributed to approximately 88% of worldwide disease burden, took up only 10% of the resources; a huge paradox. Leading contributors to the burden of disease were communicable and perinatal disorders affecting children. The substantial burdens of neuropsychiatric disorders and injuries have been sub-optimally recognized. None-the-less, the epidemiological transition in terms of Disability-Adjusted Life Years (DALYs) worldwide has progressed greatly in China, South America and the Caribbeans, several Asian countries and islands, and the Middle East; Sub-Saharan Africa still lags behind.

More recently in 2010, there were 52.8 million deaths globally. Communicable, maternal, neonatal, and nutritional causes accounted for 25% of deaths worldwide, a figure down from 34% in 1990 [9]. This drop is plausibly explained by decreases in mortality from diarrhoeal disease, lower respiratory infections, neonatal disorders, measles, and tetanus. However, deaths from HIV/AIDS increased and reached a

peak in 2006. Malaria mortality also rose by about 20% between 1990 and 2010. Tuberculosis mortality presented a steady rise. Mortality caused by non-communicable diseases rose steadily, contributing to two of every three deaths worldwide. The specific contributors were: cancer, ischaemic heart disease, stroke, and diabetes. The proportion of global deaths due to injuries was slightly higher in 2010 compared to earlier data (8.8%). This was due to a 46% rise in deaths associated with road traffic accidents, and a rise in deaths from falls. Global mortality is well illustrated in Figure 2.

Viewed from another angle, the three leading risk factors for global disease burden are high blood pressure; tobacco smoking; and household air pollution from solid fuels. These accounted for 7.0%, 6.3%, and 4.3% of global DALYs in 2010 respectively [10]. Dietary risk factors and physical inactivity collectively accounted for 10.0% of global DALYs, with the most prominent dietary risks being diets low in fruits and those high in sodium (Table 1). Important risks that primarily affect childhood communicable diseases include unimproved water and sanitation, and childhood micronutrient deficiencies. These have seen a global drop in rank since 1990. However, in most of sub-Saharan Africa childhood underweight and non-exclusive and discontinued breastfeeding have posed a raised threat. Arguably, the leading risk factor for disease after childhood in Eastern Europe, Latin America, and sub-Saharan Africa in 2010 was alcohol use. That in most of Asia, most of Latin America, North Africa and Middle East, and central Europe was high blood pressure. Despite reductions, tobacco use remained the leading risk in high-income North America and Western Europe. High body-mass index has increased worldwide, and it is the leading risk in Australasia and southern Latin America, and also ranks high in other high-income regions, North Africa and Middle East, and Oceania.

In a nutshell, worldwide, the contribution of different risk factors to disease burden has changed substantially, with a shift away from risks for communicable diseases in children towards those for non-communicable diseases in adults. These changes are related to the ageing population, decreased mortality among children younger than 5 years, changes in cause-of-death composition, and changes in risk factor exposures. In much of sub-Saharan Africa, the leading risks are still those associated with poverty and those that affect children.

The current world population of 7.2 billion is projected to



Year	Risk factor	Predominant disease(s)
1990	1 Childhood underweight	
	2 Household air pollution from solid fuels	L, P, M L, B, C
	3 Tobacco smoking, including second-hand smoke	B, A, L, C
	4 High blood pressure	B, Q
	5 Suboptimal breastfeeding	L
	6 Ambient particulate matter pollution	B, L, C
	7 Diet low in fruits	B, A
	8 Alcohol use	I, E, F, D, T, U, R, K, O, G
	9 High fasting plasma glucose	B, J, N
	10 Iron deficiency	P, O
	11 High body-mass index	B, Q, A
	12 Diet high in sodium	B, Q, A
	13 Diet low in nuts and seeds	B
	14 High total cholesterol	B
	15 Unimproved sanitation	L
	16 Diet low in vegetables	B, A
	17 Vitamin A deficiency	L
	18 Diet low in whole grains	B, H
	19 Zinc deficiency	L
	20 Diet low in seafood omega-3 fatty acids	B
2010	1 High blood pressure	
	2 Tobacco smoking, including second-hand smoke	B, H
	3 Household air pollution from solid fuels	B, A, C, L
	4 Diet low in fruits	B, H, C, L
	5 Alcohol use	B, A, L
	6 High body-mass index	S, I, E, B, A, D
	7 High fasting plasma glucose	B, H, A, F, I
	8 Childhood underweight	H, B,
	9 Ambient particulate matter pollution	L, P, M
	10 Physical inactivity and low physical activity	B, A, C B, A, J B, A, J
	11 Diet high in sodium	B
	12 Diet low in nuts and seeds	B
	13 Iron deficiency	P, N
	14 Suboptimal breastfeeding	L
	15 High total cholesterol	B, J
	16 Diet low in whole grains	B, A
	17 Diet low in vegetables	B
	18 Diet low in seafood omega-3 fatty acids	G, K
	19 Drug use	S, U
	20 Occupational risk factors for injuries	

**Key**

A. Cancer	L. Diarrhoea, lower respiratory infections, and other common infectious diseases
B. Cardiovascular and circulatory diseases	M. Neglected tropical diseases and malaria
C. Chronic respiratory diseases	N. Maternal disorders
D. Cirrhosis	O. Neonatal disorders
E. Digestive diseases	P. Nutritional deficiencies
F. Neurological disorders	Q. Other communicable diseases
G. Mental and behavioural disorders	R. Transport injuries
H. Diabetes, urogenital, blood, and endocrine	S. Unintentional injuries
I. Musculoskeletal disorders	T. Intentional injuries
J. Other non-communicable diseases	U. War and disaster
K. HIV/AIDS and tuberculosis	

**Table 1:** Global burden of disease attributable to 20 leading risk factors, in descending order of magnitude, expressed as disability-adjusted life years (DALYs); trends over two decades.

venture. Consideration of some of the avenues to achieving this need, call for more insight. Earlier sections of this discussion have pointed out the need for appropriate and feasible training and implementation. In the long run, solutions to alleviating the global burden of surgical disease lie in creating a domestic surgical workforce, capable of responding to the major causes of surgically related morbidity and

mortality. The influx of volunteers and expatriates, with all their good intentions, only provide temporary relief. They are largely out of touch with the real situation.

Training programs have to include non-physicians, and contain a good working knowledge component of anaesthesia. Emphasis ought to be on the essentials of surgical practice. The objectives of the training should be set, and the components well coordinated. The process shouldn't be unduly long; short, intensive courses with further apprenticeship, are suitable. Academic institutes of tropical medicine, which have been in place for many years in various parts of the world, have made fundamentally vital contributions. Their influence on global health is evident. However, in spite of this effectiveness, the health workers involved in these institutes are not equipped with the resources to handle essential and basic surgery. Additionally, they have neither the time nor the expertise in areas related to surgery.

Tropical surgery is not just a transfer of skills, equipment and funding from high-income countries to this different environment. The complexities of surgical practice in the tropics are vast and varied [16]. Facilities are often basic, technological resources minimal and scarce, and finances very limited. Given the patient numbers, time for appropriate care is quite challenging. Surgeons often operate with minimally trained assistants, yet they may have to perform procedures which they are not well versed with. Anaesthesia is administered without a trained anesthesiologist; improvisation is the order of the day.

Surgery must, and can, be done with what is available, and not to be deemed impossible just because some advanced equipment is unavailable. Great improvements in trauma are achievable with minimal financial and technological capacity. Standards can be set, based on the outcomes of measures taken. One of the biggest set-backs is the lack of recorded data. Huge volumes of surgery are done without any forward submission for any form of analysis. This leaves practically no information about the suitability and effectiveness of most surgery that is done in the tropics. Yet, at the back of all this, much amazing and excellent work is done in adverse circumstances.

The lessons learned are, largely, never disseminated to a global audience. Additionally, when novel techniques are unveiled, for instance, the Hernia Prolene System (HPS) inguinal hernia repair, there are no data to support its applicability in our settings, compared with other methods. The "inferiority complex" tends to override, with the new method often being adapted religiously, and becoming a gold standard for the tropics because it has been stated as that in the western world. Practice without research is not realistic. We ought to utilize this enormous volume of surgical data in analysis, and come up with inferences and recommendations most suitable for the tropics. Only small numbers of surgical research papers emerge from the tropics, and even among the few, quite a number are often "side-lined", or considered of limited relevance to a global audience. I am glad that this journal is already very positively, and timely, producing work done in the tropics. By having little evidence on diseases quite prevalent in the tropics, the world is starving itself of a vast pool of knowledge. Typical illustration is derived from surgical tuberculosis or HIV/AIDS. There are papers published in reputable peer-reviewed Western journals, based on analysis of small numbers of patients. I am not trying to suggest that the analysis and inferences are not important. The point here is that there exists a wealthier sea of information on these diseases, right in the tropics. We shouldn't just let that information decay.

Alongside this practice involving globally prevalent disease,

Tropical Surgery also, directly, includes the treatment of specifically tropical diseases, namely, schistosomiasis, leishmaniasis, other helminthic infections, among others. Many of these conditions are classified as the neglected tropical diseases. Fortunately, some global health champions established journals to cater for these neglected diseases. What we now need to boost, is how to manage these surgical patients in their own environment. There is also a need to delve into the impact on surgery of widespread tropical conditions, such that better understanding is attained. This category includes conditions like sickle cell disease and HIV/AIDS. These patients tend to have atypical clinical presentation of diseases like peritonitis. These observations are known to many who have gained considerable experience working in areas where such disease is rife. Unfortunately, this often remains as anecdotal evidence, having not been published and subjected to other clinical studies.

If we are to achieve sustainable global health, tropical surgery must take root. The WHO can spearhead this; we the optimists will continue the discussion and implementation of the practice. The western world and the tropics can, and should, learn from each other. Let's borrow a leaf from the unfortunate consequences of disasters, natural or man-made. Often, teams are mobilized and sent from western countries. They require knowledge on local conditions in these disaster areas, the medical environment in which they will find themselves, and the sociopolitical setting in place. Even with all their modern equipment transported to the scene, emergency teams will always have to improvise, and for this they need the experience of the tropical surgeon. In these circumstances they will often have little access to laboratory services, and so will need to know how to evaluate patient vital requirements accurately by clinical estimation alone. For this, they will need instruction from those who have had to work in such situations. They have to also get out of their cocoons. A pediatric surgeon may have to reduce and immobilize a fractured tibia, a procedure he may have only assisted in performing a few times during his earlier medical school training.

Finally, governments should show more concern, and put more money into tropical medicine/surgery research and education. New technologies ought to be used in the diagnosis, treatment, surveillance and prevention of tropical medicine. We ought to aim for more sustainable and equitable health provision through the full scale adaptation of Tropical Medicine (an already fully fledged discipline), and institution of Tropical Surgery, to work in tandem with it. Healthier discussion will then blossom even further, right within this journal.

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