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 helmintic (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]. Shorty, 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 all makes a lot of sense when viewed in the perspective of certain key themes. Tropical surgery is focused on the prevention and management of injuries caused by accidents, violence, and other trauma-related conditions. It involves both surgical and nonsurgical procedures aimed at treating patients with surgical conditions. Tropical surgery is a key component of the broader field of tropical medicine, which encompasses the study of diseases and health conditions prevalent in tropical and subtropical regions. Tropical medicine is also referred to as international medicine, and it deals with health problems that occur uniquely, are more widespread, or are indeed more difficult to control in tropical and subtropical regions. It is a broad field that encompasses various disciplines, including epidemiology, virology, and parasitology, among others. Tropical medicine is important in addressing the needs of people living in these regions, who often face unique challenges due to the geographical, climatic, and economic factors of these areas. The Journal of Tropical Medicine and Surgery emphasizes the clinical attributes, diagnosis, and treatment of Tropical diseases, in both therapeutic and surgical contexts.

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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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
increase another 1 billion by 2025 and reach 9.6 billion by 2050 [11]. Regional variations that exist in disease causation should not be forgotten. Continued population growth in many countries, as well as raised population aging, urbanization, and migration is bound to have a profound impact on social and economic development, and the environment in the near future. This complex population and demographic interplay, impacts on access to - health, education, housing, sanitation, water, food and energy. By 2050 it is estimated that the earth’s human population will be 9.07 billion [12]. 62% of the people will live in Africa, Southern Asia and Eastern Asia; tropical and sub tropical regions. This, again, emphasizes the role tropical health care will have to play.

In discussing tropical health, it is important to highlight the role geographical properties of the globe play in disease distribution. Climate and water resources dictate the constitution of ecosystems. There is a significant negative relationship between latitude [13] and Parasitic and Infectious Diseases (PID) species richness. Overall, species diversity increases as one proceeds from the poles to the equator. So the tropics have a propensity to parasitic and infectious disease diversity. The effect of global climate change on infectious disease is still more hypothetical [14]. Global warming may result in an increase in certain disease prevalence’s, with new and more effective methods for control needed. But we know that rapidly warming climate is likely to seriously alter crop yields in the tropics and subtropics, and given time and lack of adaptation, will leave half the world’s population facing serious food shortages [11]. This has important health implications.

Public policy to improve the health of populations will be more effective if it addresses the major causes of disease burden. Even small reductions of population exposure to large risks, tends to yield substantial health benefits. Targeted prevention strategies aimed at leading risk factors for disease are feasible. They can be applied in Tropical health interventions.

To illustrate the effectiveness of region-wide disease control measures, I will take the example of Malaria. It is a disease which illustrates tropical and sub-tropical diversity. It is a fine example of topical/subtropical versus temperate regional disease diversity. Previously, it was even prevalent in some of the temperate regions. Through appropriate public health and epidemiological interventions, it was largely eliminated and eradicated from temperate areas. There have been many successful programs at country level. In recent times, and predictably in the near future, there seems to be a reemergence of infections in the previously malaria-free areas. Over the last century, despite human activities reducing the land area that supports malaria, by half, demographic changes resulted in a 2 billion increase in the total population exposed to the risk of malaria infections [15]. Basing on previous population projections, it is suggested that population growth per se will not substantially change the regional distribution of people at malaria risk. The world is facing a rapidly increasing disease burden. This accentuated threat has been attributed to by – population movements into malaria prevalent regions; changing agricultural practices, including the building of dams and irrigation schemes; deforestation; weakening public health systems in some low-income countries; and, ostensibly, long-term climate changes. These conditions are also very conducive for schistosomiasis, a neglected tropical disease.

Tropical surgery, as I have already highlighted, is not a fully-fledged academic discipline, like tropical medicine is. However as long as the practice of ‘medicine’ exists, so shall ‘surgery’ support it, and vice versa. So, another burning question whose answer seems just a stone-throw away is, “shouldn’t we have an official speciality of Tropical Surgery?”
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 anaesthesiologist; 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 setbacks 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 this enormous volume of surgical data in analysis, and come up with inferences and recommendations most suitable for the tropics. Only this enormous volume of surgical data in analysis, and come up with inferences and recommendations most suitable for the tropics. Only this enormous volume of surgical data in analysis, and come up with inferences and recommendations most suitable for the tropics.

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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.

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.

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

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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 time 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 and prevention of tropical medicine. We ought to aim for more money into tropical medicine research and education. New school training.

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