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Heikki Paakkonen[i], Arja Suikkala[ii], Marketta Fredriksson[ii], Patrick Owili[iii]

Motto*: "He ain't heavy, he is my brother" (Scott B. & Russell B. 1969)*

Abstract

Health care professionals are increasingly faced with challenges that require an understanding of global health trends, practices and threats. The PubMed search was limited to articles published in the Lancet journal between 2016 and 2017 with a special effort to better understand future perspectives of global health issues and ultimately to plan, reconstruct and develop the curriculum for the next cohort of the Master's Programme in Global Health Care. The database search identified 102 references of which the abstracts were reviewed more closely. As a result, the most prominent health issues are related to neglected tropical diseases (NTDs) – a diverse group of communicable diseases highlighting the importance of vaccination coverage and adequate sanitation. Organic and inorganic pollutants also pose a challenge in the form of increased burden of disease. Burden of non-communicable diseases, such as diabetes and memory disorders increase globally. Furthermore, the need for prevention, recognition and treatment of mental health problems are obvious. Unexpectedly, there were no articles related to the content of female genital mutilation (FMG) issues. Nevertheless, we became convinced that FMG cannot be omitted from the curriculum.

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1 INTRODUCTION

There is no widely agreed definition of the term global health and it is often used interchangeably with such terms as public health and international health. Koplan et al. (2009) have defined "global health as an area of study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide. Global health emphasizes transnational health issues, determinants, and solutions. It involves many disciplines within and beyond the health sciences and promotes interdisciplinary collaboration. Global health is a synthesis of population-based prevention with individual-level clinical care." Furthermore, global health involves many disciplines within and beyond the health sciences and promotes interdisciplinary collaboration with other disciplines that can affect global health, such as economy, geosciences and geography.

New health challenges are emerging in high-, middle-, and low-income countries as a result of several factors such as climate change and environmental pollution, migration from war-torn regions, inadequate or expensive health care services, gender violence, emerging and reemerging communicable and non-communicable diseases etc. Global health-related issues need to be taught on a generation that is well equipped not only on leadership and innovation but also to do research on these critical global health-related issues. Moreover, the health problems of other countries are now a global health burden even with advanced technology. For example, Ebola outbreak can easily spread across boarders because of the modern transportation systems. The world is more closely interwoven than ever before. Thus, this paper provides the basis for planning, reconstructing and developing the curriculum for the next cohort of Master's Programme in Global Health Care.

2 GLOBAL HEALTH CARE EDUCATION IN MASTER'S DEGREE PROGRAMME

Master´s Degree Programme in Global Health Care is designed to respond to the challenges faced by people on planet Earth due to climate change, rapid population growth, threats of terrorism, industrial development, and rural and urban development trends as experienced in both North and South countries. The programme is jointly organized by the coalition of three accredited higher education institutions in Finland and Kenya: Diaconia University of Applied Sciences (established in Finland), Arcada University of Applied Sciences (established in Finland) and University of Eastern Africa, Baraton (later Baraton, established in Kenya). Master´s Degree Programme in Global Health Care (also referred as

Master of Science in Global Health Programme at Baraton University) aims at training students with a bachelor's degree in nursing or other related health sciences and with genuine interest in developing their skills and competencies to be able to act in training, leading and developing positions in the field of disaster management and preparedness. The programme offers professional development in four competence areas: Evidence based Global Health, Ethics and Values, Global Health Research and Development, Global Health Policies and Actors, and Incident and Emergency Condition Work. Graduates awarded the qualification of Master of Global Health Care are qualified for key positions in emergency and disaster training, management and development both at home and abroad, and they will be well versed in advanced research and innovation in regards to this field. (Anjejo et al 2013.)

The value-based curriculum for Master's Programme in Global Health Care focuses on the disaster preparedness and crisis management. The theoretical framework is based on Leininger's Theory of Transcultural Nursing and the values of love, forgiveness, compassion, participation and safety. The studies are offered by the methods of blended learning including virtual studies and intensive learning symposiumwhich takes place in Kenya. The implementation location of the intensive learning symposium is the disaster areas, eg. flood prone area or some other relevant area in Kenya, and the University of Eastern Africa, Baraton. Intensive courses familiarize students to conduct community analyses, learn the local situation, compare the local situation to the global health situation with an ultimate aim to produce learning assignments and final master's thesis for the benefit of these communities in Kenya. Thus, this jointly organized intensive learning symposium requires also student mobility. The scope of this programme, in Finland, is 90 ECTS and 45 Credits in Kenya. (Anjejo et al 2013.)

3   PURPOSE AND AIM

The purpose of this endeavor was to find evidence-based data on global health issues that are considered, by health-care specialists, to call for urgent actions. The aim was to highlight themes to be taken into account when planning, reconstructing and developing the curriculum for the next cohort of Master's Programme in Global Health Care.

4   MATERIALS AND METHODS

The method chosen was a literature search among the journal *The Lancet* which is a weekly published peer-reviewed general medical journal. It is one of the world's oldest and best known general medical journals founded in 1823. *The Lancet* has established several specialty journals e.g. *The Lancet* Neurology, *The Lancet* Oncology, *The Lancet* Infectious Diseases and *The Lancet* Global Health. We decided to review the journal and the specialty journals published during the last two years (2016-2017) paying attention to global health issues brought out. Authors' unscientific experience demonstrated that *The Lancet* and the specialty journals repeatedly cover global health issues in the published articles. This was considered to be a valid criteria for choosing these sources as the objects of our literature review.

Special effort was invested in trying to find possible future perspectives among the articles dealing with global health issues. However, there does not seem to prevail a generally acknowledged definition of the concept of *future*. The authors decided to apply several futures researchers' definition of middle range future i.e. five to twenty years from now (Brier 2005, Paakkonen 2008).

The decision to conduct a literature search among the journal *The Lancet* and its specialty journals was made at the meeting of the three universities' representatives at Baraton University of East Africa, Kenya, in January 2018. The decision was unanimous.

5   LITERATURE SEARCH

The Search was conducted in January 2018 in PubMed –database. It was narrowed down to the Lancet publication and the MeSH- search term "global health"; the date range was set to the past two years (2016-2017). The result was 102 hits of which the chosen abstracts were reviewed more closely.   *The search: ("Global Health"[Mesh]) AND "the Lancet"[Journal] Filters: From 2016/01/01 to 2017/12/31.*

6 GLOBAL HEALTH CHALLENGES AS PRESENTED IN THE LANCET

The abstracts (*n* = 102) published in The Lancet journal between 2016 and 2017 produced evidence of actual issues related to global health. The main areas regarding global health challenges focused on the trends of communicable diseases such as infections caused by viral, bacterial, and/or parasitic organisms or fungi. Non-communicable diseases were such as neurological diseases, diabetes and those related to substance abuse and mental health problems. These will add to the challenges already facing many developing countries. A particular clearly stated future orientation could be discovered in five of the 102 articles scrutinized in this endeavor.

The challenge is to continue to push holistic maternal health well beyond pregnancy and childbirth to enable all women to realise their full potential in all facets of their lives (Knaul et al 2016, Paireau et al. 2016, Popova et al. 2017) as well as new born health (Blencowe et al. 2016, Popova et al. 2017). The burden of HIV on adult mortality is rapidly shrinking, but remains large for women, despite their better engagement with HIV-care services (Reniers et al. 2017). Globally, cryptococcal meningitis is responsible for 15% of AIDS-related deaths and this highlights the substantial ongoing burden of HIV-associated cryptococcal diseases as a metric of HIV treatment programme failure; timely HIV testing and rapid linkage to care remain an urgent priority. (Rajasingham et al. 2017.) Prevention of mother-to-child transmission of HIV (Wang et al. 2016) as well as maternal and congenital syphilis (Wijesooriya et al. 2016) have been successes of global health. HIV and mother-to-child transmission of syphilis or other sexual transmitted infections as well as all types of viral hepatitis, A, B, C, D, E can be either prevented by vaccinations or cured by medicines (Dehne et al. 2016, Osterholm et al.2016 , Rajasingham et al. 2017, Reniers et al. 2017, Shearer et al. 2017, Trentini 2017, Unemo et al. 2017).

The highest numbers of children with tuberculosis are in Africa and Southeast Asia. The World Health Organisation Eastern Mediterranean region, European region, and Western Pacific region also contribute substantially to the burden of drug-resistant tuberculosis because of their much higher proportions of resistance. Far more drug-resistant tuberculosis occurs in children than is diagnosed, and there is a large pool of drug-resistant infection. (Dodd et al. 2016.) There is evidence that investments in social protection could contribute to a reduced tuberculosis burden, especially in countries that are investing a small proportion of their GDP in this area. However, further research is needed to support these ecological associations. (Siroka et al. 2016.) Without adequate treatment,

children with tuberculosis, especially those younger than 5 years, are at high risk of death. Children with HIV have an increased mortality risk, even when receiving tuberculosis treatment (Jenkins et al.2016). At the same time, the numbers of cases and deaths of pertussis in children have fallen substantially (Yeung et al. 2017). Tuberculosis screening by (mobile) chest radiography improved screening coverage and tuberculosis identification, reduced diagnostic delay, and was cost-effective among several hard-to-reach populations (Heuvelings et al. 2017).

Cost-effective and impactful prevention strategies (McGillen et al. 2016) and continued efforts are needed to improve access to reducing new infections (Wang et al. 2016, Wijesooriya et al. 2016). Communication of the importance and the safety of vaccination to be able to close the immunisation gap and thus meet the elimination targets for diseases (Shearer et al. 2017, Trentini 2017). Measles can be eradicated through vaccination coverage (10.1016/S1473-3099(15)00504-6). There is need for vaccination coverage, innovations in prevention of mother-to-child transmission and population-wide testing to eliminate such major public health threats (Larsson et al.2016, Nayagam et al. 2016) and new born infections (Fitchett et al. 2016). There are important gaps, e.g. in vaccination coverage, that can contribute to improved quantification of outbreak risk, and help to guide planning of future vaccination efforts and emergency stockpiling (Shearer et al. 2017).

The incidence of unprecedented emergence of epidemic arboviral diseases (notably dengue, chikungunya, yellow fever, and Zika virus disease) have been seen in last decades resulting from the triad of the modern world: urbanisation, globalisation, and international mobility (Stanaway et al. 2016, Wilder-Smith et al. 2016). Of these, the Zika-virus as a new infectious disease has a potential link with neurological disorders, and it is essential to have rigorous research protocols to obtain reliable and meaningful data. An estimated 2.6 billion people live in areas of Africa and the Asia-Pacific region where the presence of competent mosquito vectors and suitable climatic conditions could support their vulnerability to Zika virus. Strategic use of available health and human resources is essential to prevent or mitigate the health, economic, and social consequences of Zika virus, especially in these areas. (Bogoch et al. 2016.)

With global malaria eradication on the international agenda, malaria control altering local transmission and the threat of drug resistance, understanding these patterns and their drivers is increasing in importance (Tatem et al. 2016). Investment strategies concerning malaria should consider more equitable research and operational investments across countries to include currently neglected and susceptible populations (Head et al. 2017). Schistosomiasis (bilharziasis) also remains an important public health issue, with a large number of cases reported across sub-Saharan Africa, and parts of Asia and Latin America (Lo et al. 2016,

Xu et al. 2016). The burden of scabies is greater in tropical regions, especially in children, adolescents, and elderly people (Karimkhani et al. 2017). Furthermore, the burden from cutaneous leishmaniosis mainly falls on countries in Africa and the Middle East. Global and national data on the burden of cutaneous leishmaniosis disease are pivotal to promote field studies and initiate behavioral change. (Karimkhani et al. 2016).

There is an increasing aged population in Africa with burden of diabetes and other non-communicable diseases, such as dementia. There is also need to invest, economically, in prevention and treatment of mental health problems (Chisholm et al.2016, Farooq et al. 2016, McIntosh et al. 2016, Summergrad 2016, Vigo et al. 2016) as well as to strengthen tobacco and other substance use control interventions and programmes in young adolescents globally but also to an increasing extent among those from low-income and middle-income countries (Hall et al. 2017, Mehrtash et al. 2017, Xi et al. 2016). These cause health-, social-, and economic consequences for individuals and societies with weak health systems, which are ill prepared to manage the swift epidemiological transition of NCDs (Davies et al 2016). Thus, there is an acute need for new data in order to get the needed information for prevention, identification and reduction of the risk, planning and delivering of services and allocation of funds (both domestic and from international donors) in order to match and track demand, and to ensure the best possible solutions for the unique needs of African people (Davies et al. 2016, Shah et al. 2016).

There is also need to ensure universal access to medicines for these communicable diseases (Beran et al. 2016). Furthermore, elder abuse seems to affect one in six older adults worldwide. Nonetheless, elder abuse is a neglected global public health priority. (Yon et al. 2017.)

Civil wars with refugees living in cramped, unsanitary camps with increased risk of diarrhoeal diseases challenge the safety of all in the camp including also doctors, nurses, and health-care workers (Troeger et al. 2016). Furthermore, it challenges to develop systems that can withstand shocks and mega-disasters but also prevent those communicable and non-communicable diseases that could circulate widely in such circumstances, compounded by shortages of medical instruments, clean running water, electricity, vaccines, protective equipment like gloves, sterilisation tools, drugs, and advanced diagnostic services. Moreover, those who endured persecution, injuries, stress, and brutality have psychological traumas, with impacts on their general and oral health, eating habits, and behaviour. Besides medical interventions, there is need to include the economic, social, psychological, spiritual, and cultural determinants of health as the kernel of global public health and health promotion. (Al Qutob 2016.)

7   DISCUSSION AND CONCLUSIONS

Our ambitious aim was to find articles with a clearly stated future orientation in order to develop the curriculum to be better prepared to tackle the challenges which are anticipated to threaten global health. However, among the 102 articles published in *The Lancet* and its specialty journals during 2016 – 2017 we could discover only five articles fulfilling the requirement of clearly stated future orientation. We still consider it reasonable to call our paper "future oriented" because the changes that will be made to the curriculum will have effects at the earliest after several years.

As expected, the most prominent global health issues were the large variety of communicable diseases. The burden of disease is largely, but not merely, responsible of the global burden of disease, which was highlighted in the articles reviewed. The first theme to be addressed in the curriculum development has to be dedicated to the whole chain of communicable diseases. Expanding the vaccination coverage and developing sanitation have to be on the checklist of the team that rewrites the curriculum.

Prevention, recognition and treatment of mental health problems emerged as one of the global health challenges that inevitable warrants attention during the pending curriculum development process. This was not expected by the authors but become evident very clearly in the articles.

Africa has been the youngest continent considering the mean age of the population. However, this is changing rapidly and ageing of the African population is carrying health-related issues with it. It seems necessary to address ageing-related phenomena in the curriculum.

Several articles ended up with comments as follows: "The results are, however, not totally reliable due to the lack of reliable and adequately documented data. Especially, epidemiological data are lacking." Thus, we conclude that for our part we have to strengthen the education and training related to versatile data collection, analysis, construct and understand results and draw adequate conclusions. This applies especially to epidemiological data. On the other hand, there seems to be an apparent under-representation of research projects and authors from low-income and middle-income countries in the articles that cover health-related scenarios around the world. Interventions are needed to promote the opportunities of these "disadvantaged populations" to contribute to global health research. (Iyer 2018.)

7.1 Weak signals detected

The authors dare to claim that we could discover two group of phenomena that might be called weak signals of the future. However, these signals are not weak, as explained next. First, neglected tropical diseases – a diverse group of communicable diseases that prevail in tropical and subtropical conditions – affect more than one billion people and cost developing economies billions of dollars every year. Populations living in poverty, without adequate sanitation and in close contact with infectious vectors and domestic animals and livestock are those worst affected (http://www.who.int/neglected_diseases/diseases/en/). Furthermore, organic and inorganic pollutants also poses a challenge of increased burden of disease in several regions.

Secondly, unexpectedly, among our material we did not find any articles related with the content of female genital mutilation (FMG) issues. The authors were left with astonishment as we were convinced that FMG most probably will be one phenomena that has to be highlighted when the curriculum is rewritten. The reason for this remains unclear for the authors and the speculation about it is left outside this paper. However, this issue can hardly be omitted from the curriculum.

Thirdly, issues related with cross-border management and collaboration on emerging infectious diseases were also limited in the materials reviewed. The world has become a global village and health problems have not remained the problems of "other countries." Almost all United Nations countries have committed to developing and upholding public health principles required for detecting, diagnosing, reporting and responding to public health menace as entrenched in the WHO's International Health Regulations (IHR). (World Health Organization, 2008.) Other also committed to assisting nations with low capacities. Nevertheless, as the world becomes more closely knit, there is need for more research on cross-border disease management and response strategies within and between countries to help inform decisions and the next generation of Global Health students and the allied fields.

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