MTb

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FROM TROPICAL MEDICINE TO GLOBAL HEALTH

CONTENT

Cover: Cape Province South Africa

WHAT'S IN A NAME?

Global is hot. No, we are not referring to global warming – denied by some, worrisome to many others. No, this time the spotlight is on global health. It is the focus of the celebration of the 110th anniversary of the Netherlands Society for Tropical Medicine and International Health (NVTG) on June the 9th. It is also the focus of this MT*b*.

The definition of global health is a subject of debate among scholars and practitioners, as it encompasses many angles and implies a multidisciplinary approach. As Koplan et al. explain in the Lancet (2009), *"A shorthand term such as global health might obscure important differences in philosophy, strategies, and priorities for action between physicians, researchers, funders, the media, and the general public"*. According to them, global health is considered more politically correct than international health. This could be true, as history shows us that health issues and how they are dealt with is very much part of a wider context, including geopolitical relationships and socio-political and economic circumstances in a particular country. And interestingly, with globalization impacting highly on all spheres of our daily lives, we seem to increasingly cherish the local flavours of our direct environment. Or as described by the historian Leo van Bergen in his keynote address delivered at the 2017 NVTG conference: 'global health in times of nationalism'.

It is of course more than a semantic discussion, as Zijlstra also argues in his article. *'Global health did not develop from tropical medicine, nor has it replaced it'*. On the contrary, the two disciplines are complementary. Examining more closely the features of global, international and public health, one can see the commonalities – for example international and global health both promoting prevention in populations and clinical care for individuals – but also the differences, most notably in their geographical reach. One of the differences is that global health takes a *truly* global approach by focusing not only on health issues in low- and middle-income countries alone.

Global health is also popular among students, and many universities are offering bachelor and master programmes and short courses in global health. Van de Velden et al. and Koot highlight some of these trends, presenting an overview of 'who is doing what and where' in global health education in the Netherlands. The multidisciplinary nature of the concept is embraced in the curricula, and what was initially meant for medical students (only) has become quite popular among students of health/life science and other students. In *a truly global spirit*, global health leverages both perspectives – the medical and the social – to jointly 'tackle' cross-border health problems, at home and abroad.

Ankie van de Broek, chair of NVTG, looks back at her 34 years with the Society, sketching a personal view of more than three decades in which the NVTG remained true to its mission – amidst the many changes that of course influenced the Society. It comes as no surprise that the discussion of the Society's name – and what the NVTG stands for – has been on the agenda many times. That the sentiments were strong is evident, as it wasn't until the year 2000 that 'international health' was added to the name. Twenty years later, is it time to consider changing the name yet again?

ESTHER JURGENS, ED ZIJLSTRA

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From Tropical Medicine to Global Health?

Equity in health for all, but needs differ

The concept of Global Health was introduced in the beginning of the 21st century to describe the interrelationship of health issues of all people, including those living in low- and middle-income countries (LMICs), classically the domain of tropical medicine and tropical hygiene. It encompasses all preventive as well as curative aspects of health care and aims at equity for all. Does this mean that Tropical Medicine as a discipline is best abandoned and that a geographical focus is no longer-appropriate? How does this affect health care in LMICs?

COLONIAL MEDICINE

Patrick Manson (1844-1922) is generally considered the father of tropical medicine. He lived during the era of colonial expansion of Great Britain, which also occurred in France, Germany, Belgium and the Netherlands. At the time, tropical medicine took shape as a discipline dealing with diseases that were common in hot climates overseas, that were related to poverty, and that were often caused by parasites transmitted by vectors from an animal reservoir. As civil servants and the military were affected by these exotic and unknown conditions in the colonies and after returning home, Manson emphasized the need of special training and research. At the same time, others identified the need for prevention and hygiene (Tropical Hygiene). [1]

In 1997, when colonial times were well behind us, a motion to abandon tropical medicine as a formal discipline was rejected during a debate among members of the Royal Society of Tropical Medicine and Hygiene in the UK. Those opposed argued that the field of tropical medicine had expanded and had become more diverse and now included infectious diseases and non-communicable diseases, all of which affect populations in the tropics as well as expatriates. [2]

FROM COLONIAL MEDICINE TO MEDICINE IN THE (SUB)TROPICS

Starting in the 1980s, healthcare in many parts of the (sub)tropics became dominated by the HIV/AIDS epidemic, and limited resources remained available for the classical tropical diseases. The practice of care was even referred to as the medicine of immunosuppression. [3] An epidemic of tuberculosis followed in the wake of HIV/AIDS. Malaria remained important as optimism on achieving control through DDT spraying appeared not justified. It was not until 1997 that Neglected Tropical Diseases, which had been the core of tropical medicine during the time of Manson, were recognized by policymakers and donors and placed higher on the research agenda. Thereafter, emerging infectious diseases, emergency medicine (disasters, conflict), travel medicine, migrant health, and non-communicable diseases were defined or given more attention (Figure 1). [4] This broadening of the field of tropical medicine is also reflected in Manson's Tropical Medicine, the most authoritative textbook in the field. While the first edition in 1889 was about diseases of 'warm climates', the latest (23th) edition from 2014 covers a wide scope of infectious diseases and also includes prevention, economics, ethics and non- communicable diseases. [5]

FROM TROPICAL HYGIENE TO GLOBAL HEALTH

With the end of colonial times, emphasis was increasingly placed on the health care of all people living in LMICs. Tropical hygiene became increasingly important, in particular with regard to prevention. This included improved sanitation to prevent diarrhoeal disease, better housing, and the application of insecticides and bed nets to prevent contact with insects (leishmaniasis, Chagas' disease). Mass chemotherapy was used to treat and prevent onchocerciasis, lymphatic filariasis, and schistosomiasis. Intensive case detection has led to virtual eradication of dracunculiasis (Guinea worm), and improved vaccines and vaccine delivery have made eradication of smallpox possible, with poliomyelitis and measles likely to follow.

In addition to poverty, a failing public health infrastructure (responsible for the outbreak of Ebola), poor governance, and antibiotic resistance remain important challenges. [6] New factors include global warming, which contributes to the spread of vectors such as *Aedes aegypti* to new areas, resulting in the spread of Zika, Dengue, and West Nile and Chikungunya viruses. New outbreaks of zoonoses (Lyme disease, bird flu) have occurred, and increased international travel has led to major concern about the spread of MERS-CoV [Middle East Respiratory Syndrome Corona virus] and Ebola.

Tropical hygiene has been gradually developing. It still encompasses prevention and control as a central theme, but with a wider focus and increasing attention for global distribution, travel, zoonoses, international relations, environmental factors, and human rights. In 1964, the World Medical Association defined the ethical principles for medical research, including human subjects, in the Declaration of Helsinki, which has guided the conduct of research in the tropics. [7]

Public health and community health developed from tropical hygiene and usually concern the health of people in a certain area or region, with an emphasis on prevention and equity. It is not to be confused with Primary Health Care (PHC) (Table 1). Later, international health described the bilateral relationship between an HIC (High Income Country) and an LMIC.

'Global health' has developed from public health and international health. Over the years, several definitions have been used by different institutions (universities, donors, governments) to define their area of interest or to describe how it evolved from public health and international health or was driven by idealism with equity in health for all as the general theme. [8,9] The rapid spread of pathogens such as bird flu and Ebola as well as antibiotic resistance and obesity has contributed considerably to the evolution of the concept.

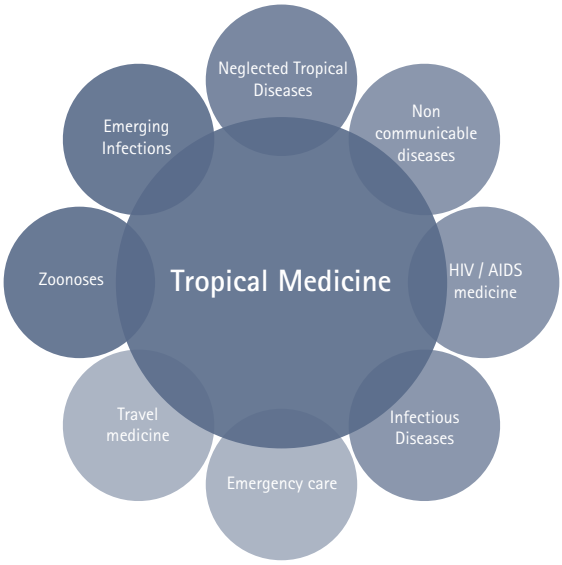

Figure 1. Broadening and deepening of Tropical Medicine anno 2017 (adapted from ref. 4)

The relationship of these various disciplines and LMICs is shown in Figure 2.

HOW ARE THE MEDICAL NEEDS OF LMICS COVERED IN GLOBAL HEALTH?

Global Health takes the overall global view and focuses on public health issues. The concept typically comes from the 'North' (HICs) while the needs from the 'South' (LMICs) are different, with poor standards of clinical care and lack of disease control as the central themes. These needs, which are typically covered by the disciplines of tropical medicine and hygiene, do not feature in global health. This lack of focus could have adverse effects for LMICs (Table 2).

Table 2. Health priorities in LMICs

Clinical care

- need to be defined in each region for primary health care and hospital-based care
- human resources
- infrastructure

Medical education

- Undergraduate
  - › focus on clinical and public health teaching relevant for that region
  - › principles of global health included in curriculum
  - › doctors need excellent clinical skills and knowledge of how to practise medicine with poor support services
  - › trained locally preferably with elective in HIC
- Postgraduate
  - › strengthening of South-South collaboration
  - › should include exposure in HIC

Research priorities

- epidemiological surveys to assess burden of disease and interventions
- surveillance of diagnoses and antimicrobial resistance
- point-of-care diagnostic tests
- effective, safe and affordable treatments

Figure 2. A schematic representation of patient care, public health, international health and global health and characteristics thereof, in relation to relevance at individual and population level, in an LMIC setting

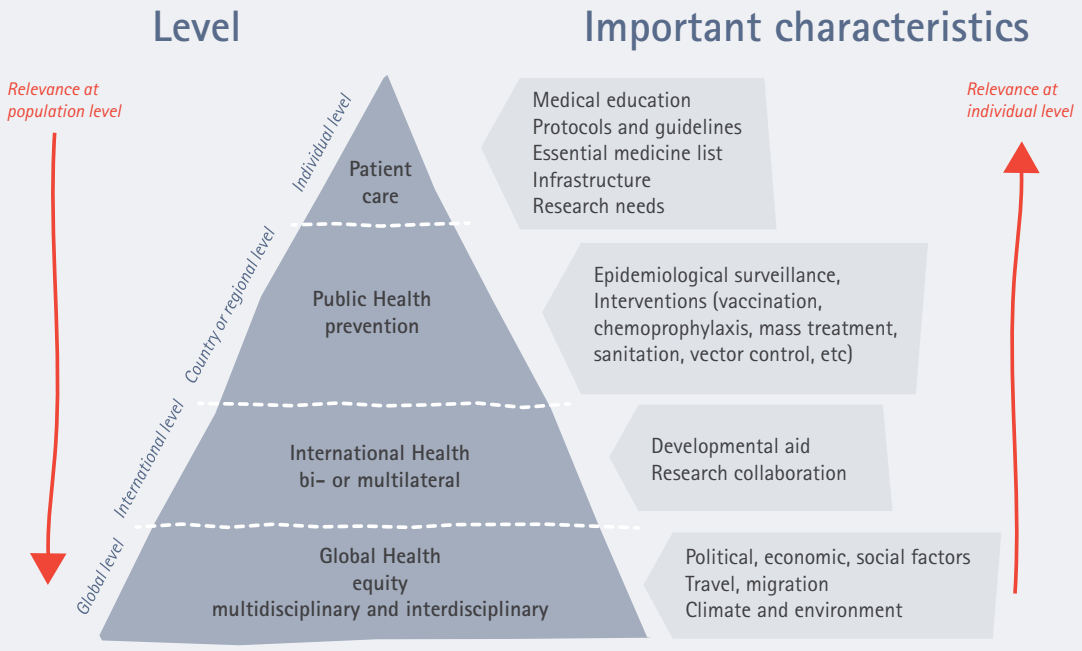

Table 1. Description of various terms used in health care

Term	Description
Tropical medicine (classical)	Classically included exotic parasitic diseases transmitted by vectors from an animal reservoir Associated with poverty and warm climates Primarily concerned with military and civil servants
Tropical medicine (modern)	Medicine in the (sub)tropics Includes all conditions relevant to a region or country: infectious and non-communicable diseases, according to local epidemiology Emphasis on curative medicine Multidisciplinary Synergy with public health
Tropical hygiene	Established at same time as tropical medicine Concerned with prevention and control of tropical diseases
Public health or community health	**Public health** includes 'all organized measures (whether public or private) to prevent disease, promote health and prolong life among the population as a whole' **Community health** tends to focus on geographical areas rather than people with shared characteristics Multidisciplinary
International health	Aims at promoting health in another nation (LMICs) Often in a bilateral relationship with a high-income country (HIC) Prevention as well as clinical care Not necessarily multidisciplinary
Global health	Has developed from Public Health and International Health Aims at health equity for all Addresses transnational health issues in holistic approach Multidisciplinary: also includes other sciences such as economics, law, history, technical sciences and biomedical and environmental sciences; includes political or economic factors. Interdisciplinary: also includes curative medicine and rehabilitation, but in a less central role. Addresses not only infections or the eradication thereof, but also all factors that influence health including nutrition (malnutrition as well as obesity), accidents, health worker migration (brain drain), urbanisation, use of tobacco etc.
Primary health care (PHC) [10]	Defined as the key to 'Health for all' in the declaration of Alma Ata PHC addresses the main health issues in a community including preventive, curative and rehabilitative services, and addresses, among other issues, immunisation, sanitation, nutrition, family planning and appropriate treatment.
'One Health Initiative' [11]	Integrates human medicine, veterinary medicine and environmental sciences, as these are interconnected. Addresses zoonoses and antibiotic resistance induced by use of antibiotics in animal husbandry.

CONCLUSION

Global health did not develop from tropical medicine nor has it replaced it, but the two disciplines are complementary. This distinction is not merely a semantic one. The expertise, training, focus and commitment acquired by those working in tropical medicine (in synergy with public health) are the best guarantee that addressing the health needs of LMICs remains the highest priority.

© ED E ZIJLSTRA, INTERNIST- SPECIALIST IN TROPICAL MEDICINE AND INFECTIOUS DISEASES, ROTTERDAM CENTRE FOR TROPICAL MEDICINE
E.E.ZIJLSTRA@ROCTM.COM

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110 years of NVTG: From Tropical Medicine to Global Health

I first became a member of the NVTG in 1983. During the past 34 years, it never crossed my mind to give up my membership. When I lived in Africa, the NVTG provided me with a platform for sharing knowledge of my profession and my experiences in different countries, and it gave me insight into where in the world other members practiced their profession. In the pre-internet era, the annual, blue-covered membership list and the black and white hardcopy of Medicus Tropicus brought us this - very relevant - information by snail mail. Tropical doctors spent many hours reading them during long, dark nights abroad. Wherever you were and however far away, it made you feel somehow a bit closer to colleagues.

After coming back to the Netherlands in the second half of the 1990s as an International Public Health Doctor, I started to appreciate the platform function of the NVTG in another way. I was an active member of the 'Health and Development' working group, and we held bimonthly meetings, exchanging updates on our profession, and organized sessions during the annual NVTG Congress. I quickly realized that the working groups were the backbone of our organisation. Many motivated professionals in tropical medicine from several medical specialties organized themselves in working groups like the public health doctors' group. The working groups facilitated the sharing of knowledge within the national and international 'tropical health' community. Many of the NVTG members from working groups contributed to the training of a new generation of doctors who wanted to work abroad.

In 2002, the name of the NVTG, although the acronym stayed the same, was changed to 'Netherlands Society for Tropical Medicine and International Health'. The focus of the NVTG broadened from the tropical climate zone to equity, and from medicine to health. Poverty related diseases, the organization of health systems and services, and capacity building in countries were all put on the agenda. Health became a field for multidisciplinary action. Not only doctors and paramedics, but also social scientists and health economists were equally needed to resolve the inequity in health. The NVTG attracted non-doctors to become members, and although the majority of our members are still medical doctors, they have become a more diverse bunch. Young researchers with a variety of professional and educational backgrounds have found their way to the NVTG. The 'tropical doctor' is now called a 'Medical Doctor in Global Health and Tropical Medicine'. The broad range of the work done in our Society will become visible during its 110th anniversary congress.

I experienced only one third of the lifetime of the NVTG. Before I joined, the Society had already existed for 55 years. The book by Leo van Bergen, *Van Koloniale Geneeskunde tot Internationale Gezondheidszorg* (From Colonial Medicine to International Health Care), published on the occasion of NVTG's centenary celebrations, gives a rich overview of facts, developments and paradigm shifts over time in relation to Tropical Medicine and International Health. Leo van Bergen's interpretation of global health trends in the past decade, written and presented for the occasion of our 110th anniversary, will add a further chapter to the history of the NVTG.

Currently, the NVTG has over 900 members. Many of them voluntarily invest a lot of energy in various NVTG activities. They make us visible - in the Netherlands and abroad - to the external professional world and to a wider audience. The NVTG acts in a continuously changing environment. For 110 years now, it has been a dynamic, committed and friendly community. I am convinced that the NVTG will not only adapt to global challenges but will also be able to initiate and accelerate changes, where and when needed.

© ANKIE VAN DEN BROEK, CHAIR NVTG
VOORZITTER@NVTG.ORG

Interview with Theo Vos

Theo Vos, MD, MSc, PhD, is Professor of Global Health at the Institute for Health Metrics and Evaluation (IHME) at the University of Washington. He is a key member of the research team for the landmark Global Burden of Disease (GBD) study, which is coordinated by IHME. In this role, he is working to improve the GBD methods, update sources of data, and develop partnerships with countries and disease experts to produce GBD estimates that are most relevant to policy decision-making. He is also focused on linking the epidemiological estimates from GBD to information on health expenditure and cost-effectiveness.

Dr. Vos received his PhD in Epidemiology and Health Economics from Erasmus University and his medical degree from Groningen University, both in the Netherlands. He also studied at the London School of Hygiene and Tropical Medicine, where he obtained an MSc in Public Health in Developing Countries.

From: http://www.healthdata.org

WHY TROPICAL MEDICINE?

'I had the idea of becoming a doctor when I was a child. I was already fascinated by the tropics by that time. This was probably because it was very common at home to have guests around from all over the world, including people from low- and middle-income countries (LMIC). So I was used to hearing and thinking about those parts of the world. My own first experience with global health was in a school-building-programme in Kenya. Thereafter, at the end of my medical study, I did a 3-month internship in the same country. After I had finished my internship, my girlfriend (who I can call my wife nowadays) came over and we travelled through Africa for six months. From my side, this was the trick to lure her to Africa; she quickly smelled a rat!

After my surgical and obstetrical training, we left for Lesotho in 1984. I was working as a bush doctor, and she as a bush psychologist. We worked there for four years and then we moved to Zimbabwe where we stayed for another five years. It was a really great experience. I am very grateful for the experiences of working in a government health system in LMICs, because I use those experiences in my current job.

I have experienced that it helps to understand the context of health problems in these settings. Often few data are available in LMICs, which raises problems in estimating burden of disease. For example, I never diagnosed ischemic heart disease (IHD) in Africa, while the statistical models based on scarce data give a higher incidence of the disease in that area. It is possible that things have changed

since the 80s, but it illustrates the very different cause pattern of diseases.'

OUT OF AFRICA?

'After many years of clinical work, the question arose what to do next. I didn't aspire pursuing a long career in Zimbabwe, because I would always feel like a foreigner. Towards the end of that period, I was already more involved in public health work, so the next step was the Master of Public Health course at the London School of Hygiene and Tropical Medicine (LSHTM). During the master programme, I was asked to stay as a faculty member, and one week later I was asked to do a project in Mauritius. I said: "I have no idea what it is, but I'll do it!"

That was my first introduction to the burden of disease concept - measuring the health of a whole population. At that time, there were no records of methods whatsoever. Yet, I was sent there as an expert. We had to build everything from scratch, which was a very interesting lesson. Mauritius was a great place to do that, because the data were quite good. They had complete records of deaths, causes of death, and hospital admissions – a far better system than in similar countries in the early 90s. Mauritius is a very interesting country as well, having a very mixed island population with people from India, China, the African continent and France. Like many other beautiful tropical islands, a lot of people are obese. As a consequence, diabetes and cardiovascular disease are very prominent. There were remnants of poverty-related diseases, like diarrhoea and pneumonia, but almost no malnutrition and way better birth outcomes than I had experienced before in Southern Africa. The example of Mauritius in the 1990s is playing out in many other LMICs. We call this the epidemiological transition: a drop in fertility, better education and increasing wealth in a country typically lead to a massive reduction in childhood deaths and a shift from communicable to non-communicable diseases. So yes, Mauritius was a very interesting place. And... a perfect place for snorkelling!'

DOWN-UNDER

'After 4 years in London and frequent commutes to Mauritius, I moved to Australia, partly to escape the poor quality of life in London, but to do similar work. I worked there as a government bureaucrat in a State Health Department but in the privileged position in which they basically let me do what I thought was important. A lot of 'burden' work for Australia, but there I also focused on cost-effectiveness analyses. It was a natural step from mapping health problems to looking at possible solutions, how effective they are and what they cost. Within Australia, I moved to Queensland for an academic position and ran a centre of burden of disease and cost-effectiveness on a larger scale. We helped many Asian and African countries do their burden of disease analyses and economic evaluations.

But this time around, we did it with much better methods of course! Ten years before, we still did much small-scale analyses, with a rather big influence by the researcher picking the one data source that best represents a population. Nowadays, we combine all the information that is known about a specific disease, and with statistical models we analyse the burden of it, including the predictors and the level of uncertainty – a much more sophisticated approach! When I came to the Institute for Health Metrics and Evaluation in Seattle four years ago, there were just over a hundred people working on the global burden of disease. Nowadays, there are over 300 and we cooperate with thousands of experts from all over the world. It is not possible anymore to do this type of work alone, like I did in Mauritius 20 years ago...'

OLD HAND

Can you give an example of your daily work?

'At the moment, I am working on the submission of a paper for the Lancet about nonfatal consequences of disease. This article is about incidence, prevalence and severity of all consequences of diseases. This morning I worked on malaria, dementia, air pollution, and zinc deficiency. Because I am one of the old hands here, I work in a very broad area. That is very important, because 25 years ago we asked folks at the WHO with responsibility for a specific disease, "How many people die from the disease you are working on?" Adding up all these estimates, we got 2.5 times the amount of global deaths that would have been possible! There are many reasons for overestimating the numbers of deaths from your "favourite" disease, for example financial reasons, but professional interests may have a strong influence as well. That obviously leads to exaggeration, although not always intentional. At our institute, we claim to be less influenced by bias, since we don't have a particular stake in any particular disease. We treat all diseases in the same way, and my main role is to be involved in all the different areas that people work on.'

WHERE TO PUT YOUR MONEY

'We create visualization tools for our data that are very user-friendly (check them out at http://www.healthdata.org/gbd/data-visualizations). Our main target group consists of policy makers, but also the general public, researchers and funders. The origin of this project lies in the Gates Foundation. Bill Gates invested large amounts of money in healthcare and he wanted to know the impact of his investments. He realized early on that when you only focus on specific problems, for example TB, malaria or HIV, you can get a very distorted picture because you ignore the rest. He funded the major part of our global project and will continue to do so the coming ten years. That is a tremendous endorsement. We built a great reputation as a neutral institute that applies the best possible scientific methods and statistics to produce estimates of the global burden of disease.

Interestingly, this type of work used to be done for a long time by the World Health Organization (WHO). That led to problems, not only because some people had financial interests, but also certain countries would disagree on certain statistics for their country. The WHO culture is to have full consultation with all countries, which makes projects like this very slow and difficult.'

FROM DOCTORING PATIENTS TO DOCTORING GLOBAL HEALTH NUMBERS

'This title of my congress* lecture was meant as a joke. Of course, our goal is to improve the care that health workers give to patients. When you look at the bigger problems and trends, you can influence health policy and find the right balance between preventive measures and care for individual medical problems. Also, how are populations changing, and how do we plan healthcare accordingly? For example, the ageing of populations and changes in disease pattern require the flexibility to shift focus to new areas beside those that have been successful in the past.'

MESSAGE FOR THE CLINICIAN

Do you have a message for tropical doctors in the field?

'With the visualization tools, you can display the health profile of any country in the world, and it is very interesting to see how this relates to what you see in your clinical practice. Are there diseases you rarely see? For example, mental disorders often present differently in African countries than in western countries. Fact is that wherever we measure, there is a substantial burden of mental health problems. Should you look differently at certain complaints? Could chronic pain be a clue of underlying depression or other mental disorders?

Another message is the importance of data collection. One of the main things that can be of enormous help is the correct registration of death certificates. I remember that when I was doing clinical work, every time I was asked to fill out such a certificate, I felt I had more urgent things to do, with a full ward of living patients. However, good registration of deaths and underlying causes is extremely valuable. The same holds for registration of usual work activities and even information about correct measurements of children's weight and length – you name it. Take this seriously. It might not have an immediate benefit, but it is an important long-term goal.'

The French paradox

One of the challenges of our work is to compare data from different countries. A famous example is the 'French paradox'. French people misbehave in many ways. They smoke a lot, drink too much and eat fatty food, yet they have very little ischemic heart disease. But when you look at the data, France marks a lot of deaths as cardiac arrests or atherosclerosis, rather vague diagnoses, most of which most likely represent ischemic heart disease. When you correct for this, half of the paradox disappears. Still, a part of the paradox remains, so there might still be some secret in the petit rouge...

*Theo Vos is keynote speaker at the symposium From Tropical Medicine to Global Health, June 9, 2017, with his presentation 'From doctoring patients to doctoring global health numbers'.

JOSEPHINE VAN DE MAAT, PHD STUDENT PAEDIATRICS
J.S.VANDEMAAT@ERASMUSMC.NL

Example of data visualisation of Global Health at the Institute for Health Metrics and Evaluation. https://vizhub.healthdata.org/gbd-compare

Global health training and education at universities in the Netherlands

Over the last decades, Global Health training and education programmes have been developed at all eight University Medical Centres (UMCs) in the Netherlands. While initially meant for medical students, these programmes have become very popular with biomedical and health/life science students. They help them to acquire a good understanding of the global burden of disease, its distribution and contributing factors. Students familiarize themselves with some of the successes, failures and ongoing efforts to alleviate the global burden of disease. They further develop critical views on the challenges that global health threats pose to local health systems and society in general, in low and middle income countries but also in Europe.

In this brief overview, we reflect on the different Global Health training and education programmes from which students can choose in the Netherlands.

All universities and all (bio) medical curricula follow the internationally accepted Bachelor - Master model. All eight University Medical Centres have incorporated global health aspects in their core BSc and MSc programmes and also offer specific global health courses (see Table 1). These courses attract Dutch and foreign students from the biomedical and health & life sciences as well as social sciences.

Medical curricula in the Netherlands are based on a nationally agreed framework that sets the targets to be achieved for all relevant topics. Although the content and the quality (indicators) of programmes are set, the way the various medical curricula are implemented differs. This has led to different priorities and emphases between the UMCs in their Global Health medical curricula. The biomedical and health & life sciences curricula have no national framework, allowing for differentiation of the training programmes at various UMCs in line with their respective expertise and specific fields of global health research.

Several faculties have recently revised their training curricula quite radically. Radboud UMC, for example, emphasizes self-directed learning and has adopted a personalized healthcare approach based on the molecule-man-population continuum. UMC Groningen dedicates 40% of its Bachelor curriculum to competency development via learning communities (of which Global Health is one), with 60% of the curriculum focused on typical medical content through problem-based learning. The CanMEDS competencies of medical expertise, communication, collaboration, health advocacy, academic development, professionalism and leadership are at the heart of the curriculum.

LAYING A GOOD BASIS IN THE BACHELOR PHASE

The various curricula typically offer three types of Global Health training and education programmes:

- *a loose set of elective or compulsory courses* around Global Health themes throughout the bachelor phase. This used to be the set-up, but at most UMCs it has been replaced by:

- *a minor in Global Health*: over a period of 10 to 20 weeks, students follow a programme organised around a certain theme or a mix of themes (e.g. sexual & reproductive health rights, child health, infectious disease control, non-communicable diseases, health systems development), sometimes followed by participation in or evaluation of a project in a low or middle income country. In other cases, it includes a visit to one or more multilateral health agencies (WHO, UNAIDS, the International Red Cross).

- *a profile in Global Health*: at Groningen University Medical Centre, first-year medical students may choose Global Health as one of four bachelor profiles.

THE VALUE OF INTERNSHIPS IN THE MASTER PHASE

Medical students have the option of a doing a clinical Tropical Medicine/Global Health internship for three months in a hospital in a low or middle income country or a research internship. Several faculties have a long tradition of providing clinical internships, sometimes in partnership with universities in Africa, Asia or Latin America. Some offer preparatory courses that include specific skills training and social-cultural aspects of working in a foreign setting. UMC Utrecht offers an on-line pre-departure course. Biomedical and health/life science students may do a research internship abroad as part of their master training.

Students who completed an internship in a low or middle income country have pointed out that it is an invaluable experience to get exposed to a foreign setting and situations of serious resource constraints. It broadens their horizon and helps them to expand their

EDUCATION

University	Bachelor	Master phase	Other courses
UMC Groningen	Learning Community in Global Health www.rug.nl/bachelors/medicine-profile-global-health/programme	Tropical Medicine course (preparation course for interns) https://www.panacea.nl/nl/master/vereniging/nieuws/2017-01-27-tropencursus-master Internships abroad	Master in Clinical and Psychosocial Epidemiology track with options for Global health research topics. Summer school course Global Health http://www.rug.nl/research/gradschool-medical-sciences/summerschools/global-health
UMC Utrecht	(the Global Health and Tropical Medicine course for MSc students is open to BSc students as well)	Global Health and Tropical Medicine course http://portal.juliuscentrum.nl/globalhealth/en-us/education/educationprograms/globalhealthtropicalmedicinecourse.aspx Clinical and public health internships Global health scientific internships, e.g. http://portal.juliuscentrum.nl/globalhealth/en-us/education/educationprograms/studentinternships.aspx Global Health online pre-departure course	Summer school courses: - Reproductive and Maternal Health: a global perspective - Challenges in Global Health - Fundamentals of Global Health http://portal.juliuscentrum.nl/globalhealth/en-us/education/educationprograms/summerschoolutrecht.aspx In preparation: Global Health & Primary Care 'Transition year' (6th year students; expected start Sept 2017)
VUmc Amsterdam	Minor in Global Health www.vu.nl/nl/opleidingen/minoren/a-z/global-health/index.aspx	Global Health Research Masters, 2 years http://masters.vu.nl/en/programmes/global-health/index.aspx#accept	Summer school: - Global Health course http://bachelors.vu.amsterdam/en/summer-school/courses/GlobalHealth/index.aspx
UvA/AMC, Amsterdam	Minor in Global Health, Care and Society www.uva.nl/shared-content/programmas/en/minors/global-health-care-and-society/global-health-care-and-society.html?origin=82GWfEiiTCOFzZKOK9%2FDZA	Global Health and Development course, as part of the Master in Medical Anthropology and Sociology (MAS) http://gsss.uva.nl/content/masters/medical-anthropology-and-sociology/study-programme/study-programme.html	Winter school courses (thematic electives in MAS): - Medicine and Human Rights in cross-cultural perspectives - Anthropology of Sexuality, Aids and Reproductive Health -Culture, Psychology and Psychiatry http://studiegids.uva.nl/xmlpages/page/2016-2017-en/search-programme/programme/2084/179521
Erasmus MC, Rotterdam	Minor in Global Health www.eur.nl/minor/minoren/faculteit/emc/trogeind/	Clinical and public health internships abroad	STOLA course (Association for Internships in developing countries) www.stichtingstola.nl

University	Bachelor	Master phase	Other courses
Maastricht University, Faculty of Health, Medicine and Life Sciences	Elective courses www.maastrichtuniversity.nl/about-um/faculties/faculty-health-medicine-and-life-sciences International Track Medicine www.maastrichtuniversity.nl/education/bachelor/bachelor-medicine-1	Global Health, 1 year www.maastrichtuniversity.nl/education/master/master-global-health	
Radboud UMC, Nijmegen	Minor in Global Health & Infectious Diseases, including visit to WHO HQ in Geneva www.studiegids.science.ru.nl/2015/en/fmw/prospectus/biomed_ba/course/38552/ Global Health research internships	Global Health & Infectious Disease course (4 weeks), with emphasis on Health Technology Assessment Clinical and Public Health internships abroad Research internships	
Leiden UMC and Leiden University College	Major in Global Public Health, Leiden University College https://studiegids.leidenuniv.nl/en/studies/show/4921/Global-Public-Health#tab3 Half Minor in Global Health (10 weeks) with modules on infectious diseases, NCDs, Safe Motherhood and global aspects of women's cancers https://www.lumc.nl/onderwijs/international-students/electives	Clinical and public health internships abroad Global health scientific internships	Obstetrics and Gynaecology in low-income settings (course for AIGTs)

personal networks. It also helps them in making a choice whether to specialize as a doctor global health & tropical medicine – or as a global health researcher – and pursue an international career.

Our modern society requires global health professionals who have not only (bio) medical and public health skills and expertise, but who are also able to work in multidisciplinary teams and appreciate different socio-cultural environments. Today's students are the professionals of tomorrow. They are expected to actively contribute to appropriate forms of healthcare and health systems that incorporate appropriate and sustainable innovations that societies value and can afford.

KOOS VAN DER VELDEN, RADBOUD UMC
KOOS.VANDERVELDEN@RADBOUDUMC.NL

KERSTIN KLIPSTEIN-GROBUSCH, UMC UTRECHT
K.KLIPSTEIN-GROBUSCH@UMCUTRECHT.NL

LEON BIJLMAKERS, RADBOUD UMC
LEON.BIJLMAKERS@RADBOUDUMC.NL

Make way for a new generation of Global Health doctors

The Learning Community in Global Health is offered by the University Medical Centre Groningen. Between 100 and 120 students join this learning community annually to actively participate for up to three years. About half of the students come from abroad, and of the Dutch students, more than half have lived abroad for some time. It truly is an international learning community. The former International Bachelor of Medicine programme in Groningen laid the foundation for the Learning Community in Global Health (LCGH). Three of the five members of the Global Health core team and around a quarter of the 60 coaches involved in small-scale education have worked abroad themselves.

FOCUS ON DEVELOPING COMPETENCIES

LCGH students participate in course modules where health issues are put in a global context: infectious diseases (malaria, HIV, hepatitis C, etc.), non-communicable diseases (COPD, diabetes, anaemia, etc) and safe motherhood. Students analyse preventive programmes such as polio eradication, nutrition rehabilitation, and vitamin supplementation. They are challenged to discuss ethical, political and cultural aspects of health, for example in abortion, depression or end-of-life issues. Students are exposed to the right to health, equity issues and access to medicines. They discuss the organisation of health services, for example in relation to emergency medical care or maternal health. They play the role of an MSF doctor performing triage in emergency situations, and they compare diseases and treatment options across countries. It goes without saying that much attention is focused on public health and epidemiology in the LCGH. Students also learn how to critically analyse scientific literature and perform statistical analysis on large databases.

As we focus on competency development, students learn to write essays, produce posters, give pitch presentations, and participate in debates or role plays. They even learn how to make videos and animations. Students in the Global Health modules are assessed on how they translate theory into practice. There are no written exams.

During the last semester of the Bachelor programme, students perform a project in which they demonstrate their competencies, usually in the form of a product that has a direct relation to health service delivery such as health education materials, a work plan for health promotion, or an analysis of an ongoing nutrition project. Students are challenged to identify and propose their own project. This year around 40 of our students went abroad, mostly to low income countries, to work on nutrition, maternal health, child health, etc.

INTERNSHIPS ABROAD

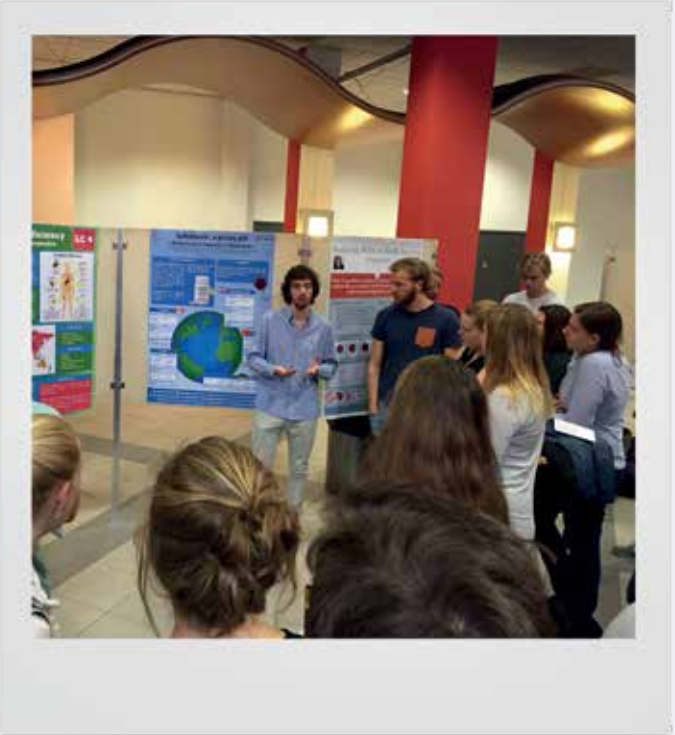
In the Master phase, when students no longer participate in learning communities, they may follow the Global Health track and opt for an internship abroad, e.g. in surgery, internal medicine, tropical medicine or public health. Alternatively, they can do a research project abroad. The maximum duration of an internship abroad is 54 weeks, which comprises 40 percent of the Master programme. Students going abroad follow an extra course on tropical medicine and international health. Every year, around 150 Master students from UMCG do an internship abroad.

LESSONS LEARNED

With so much attention going to Global Health and so much time spent practicing competencies, don't we neglect our duty of preparing students for medical practice? We don't think so. Our students perform well in the national progress tests that are simultaneously taken in all medical schools in the Netherlands. The recent accreditation visit was very enthusiastic about our approach. We see very engaged and vocal students, who dare to present in public and dare to speak out and take initiatives in organising projects. They participate in international student organisations, go to international conferences, and maintain international relations with students and health workers abroad.

Of course, it all came at a price. It was not easy to develop competency-based education modules. We were not specialists in this type of education, so we had to learn by doing. And at times students felt they were the guinea pigs of education innovation. Even now, teaching staff sometimes find it difficult to take on the role of a coach rather than an instructor. For many students, especially those who are more familiar with traditional forms of education, self-directed learning is quite a challenge. It's sometimes easier to be taken by the hand and be told exactly what to do. But during the first semester students are coached intensively in learning how to take responsibility for their own learning process.

Live debate with WHO office in Afghanistan on polio eradication



Students presenting their posters on global health

Many students want to do an internship abroad in the Master phase. We are continuously looking for new partner hospitals that can offer our students learning opportunities. Meeting the quality standards for accreditation, however, remains a challenge for these partner hospitals.

DOCTORS WITH A NEW SPIRIT

In a recent survey, around 60% of our Dutch students in the LCGH indicated they plan to work for some time in a low or middle income country. We expect to be preparing a good number of students for training as MDs in Global Health and Tropical Medicine. We hope that these young doctors, trained in Groningen, will stand out in leadership and interdisciplinary collaboration. But even if students decide not to go abroad and prefer to work in the Netherlands, their knowledge of migrant health and divergent cultural perceptions of health and disease will enable them to contribute to Global Health. Their ability to recognise equity or gender related health issues will make them better, future-proof professionals. Our motto is 'You don't necessarily have to go to exotic countries in order to get involved in Global Health. As a medical doctor, you can practice Global Health in the consultation room, wherever you are, every day.' Global health is so much more than international medicine!

JAAP KOOT MD-GHTM MBA, DEAN OF LEARNING COMMUNITY GLOBAL HEALTH, UMCG J.A.R.KOOT@UMCG.NL

JANINE DE ZEEUW PHD, COORDINATOR OF LEARNING COMMUNITY GLOBAL HEALTH, UMCG J.DE.ZEEUW@UMCG.NL

Where do Dutch medical doctors global health and tropical medicine work?

Since its foundation in 1907, the Netherlands Society for Tropical Medicine and International Health (NVTG) has been involved in the postgraduate training of physicians.[1] After the former Dutch colonies gained their independence and after decades of globalization, the focus of this training has gradually shifted towards global health. In 2012, a two and a half years curriculum was adopted, consisting of a clinical training in Obstetrics & Gynecology, Surgery and/or Paediatrics, and courses in Public Health and in Global Health in the Netherlands, followed by a 6-months internship in a low- or middle-income country (LMIC). With the accreditation of the Medical Doctor Global Health Tropical Medicine (MD GHTM) training by the Royal Dutch Medical Association (KNMG) in 2014, The Netherlands became the first and to date only country to offer such an extensive training in Global Health and Tropical Medicine (GHTM). [2] On average 30 medical MDs GHTM graduate each year.

After completing their training, the MDs GHTM career paths are diverse both in scope and geographic location, but so far they had not been mapped yet. This article describes the result of a mapping study, which primarily aimed to identify where and for how long MD's GHTM work abroad. The second aim was to describe their further career paths after they have returned to The Netherlands.

METHOD

A survey was conducted among MDs GHTM registered in the NVTG database (about 900 email addresses). They were sent a questionnaire asking them for details about their employment record abroad as well as in The Netherlands and some demographic and geographic information of the populations they served. For consistency of data only responses from those MDs who had graduated in 1995 or later were included in the analysis.

RESULTS

In total 217 persons completed the questionnaire, of whom 146 had worked abroad after 1995. Overall, 59% were female, and this percentage increased over time. The majority of respondents had worked abroad during more than one period, resulting in 409 foreign postings in total, of which 252 took place during the years 1995-2015. Most postings were in sub-Saharan Africa, with more than a third (37%) in Tanzania, Zambia, Malawi or Sierra Leone (Figure 1). (See also Box on the project 'Linking Doctors'.)

Twenty-four percent of the respondents had worked on a local contract, and half of them had received supplementary funding. Over one third of the postings between 1995 and 2015 were for Médecins Sans Frontières (MSF; 16%), Voluntary Service Overseas (VSO; 8%) or African Health Placements (AHP; 8%). (Figure 2)

Figure 3 shows that MDs worked on average 32 months abroad (n=104) during the study period (1995-2015). This is comparable with another study by Baerends et al. among doctors who graduated between 1998-2008. [3]

The main reasons to return to The Netherlands for doctors who had worked abroad were family related issues and career ambitions in the Netherlands. As of October 2015, five out of 70 (7%) MD GHTM who graduated between 1995-2015 and who had working experience abroad were still working in a LMIC. (Figure 4)

Upon their return to the Netherlands the majority of MDs GHTM started working as a practicing physician in the Dutch health care system. Most chose to become a General Practitioner (37%), followed by Gynaecologist (17%), Surgeon (8%), Pediatrician (7%) and Emergency Room-specialist (7%) (Figure 5). Forty percent of the respondents considered a career in Public Health, and 9% actually work in the Public Health domain. 43% of the respondents indicated they have been active in research while working abroad, resulting in 8 PhD dissertations. Topics of research included tuberculosis, malaria, growth charts and maternal mortality.

No reliable statistics on unemployment of graduates from 1995 onwards upon their return to the Netherlands were found. Stolk et al. reported a 24% unemployment rate among MDs GHTM that graduated in 1979-1984 (two years after return). [3] Baerends et al. found in their 2010 study an unemployment rate of 4% only. [4] Overall, looking at the role played by their training in their current position, Stolk et al. found that 80% of returning MD GHTM attribute a positive effect of their GHTM training and experience obtained abroad. [4]

DISCUSSION

The study was conducted to gain information on the career paths of the MD GHTM. It is one of the few attempts to systematically collect and analyse this information. This and other studies underline the importance of the GHTM training, for MDs working in low resource settings, but also for their subsequent career and employment after they finish their contract in LMICs. [5-7] More quantitative and qualitative research is needed to substantiate the added value of the GHTM training for MDs both in LMICs and after returning to the Netherlands.

For lack of space, Figures 3-5 are not shown; the full article can be accessed at www.nvtg.org, see under Publications

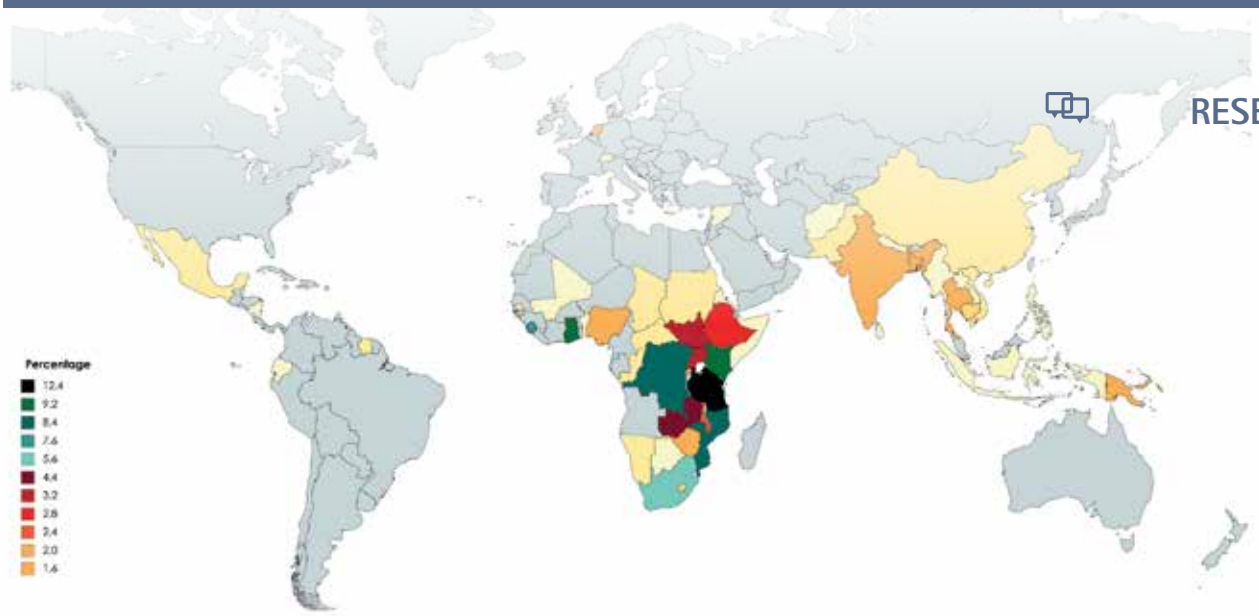


Figure 1. Countries where MDs GHTM worked between 1995-2015

Project 'Linking Doctors'

Data from this study was used to assist medical staff with an interest in working in a LMIC to find a suitable project. Therefore, the society for GHTM residents (TROIE) and the Netherlands Society for International Surgery (NSIS), together with two of the authors (JVN and MGdG), provided a platform for those who are interested in working abroad. We have formatted the majority of the LMIC projects from our study to an interactive geographical lay-out and we encourage everyone to customize their search through our database (Figure 6). Interested in becoming involved in a project? Or do you want to add your project to the database? Please go to www.surgicalneed.nl or www.troie.nl for more information.

Update April 2017: we currently have roughly 400 projects in the database. For privacy reasons, not all email addresses are displayed. We are working on providing all addresses and more detailed descriptions of the projects in the future. Feedback on the project is welcome (webmastertroie@gmail.com).

JONATHAN H. VAS NUNES, RESIDENT MD GHTM, INVOLVED IN LINKING DOCTORS PROJECT
JHVASNUNES@GMAIL.COM

MARIJE GORDINOU DE GOUBERVILLE, RESIDENT SURGEON AT VUMC, AMSTERDAM, THE NETHERLANDS. MD GHTM, INVOLVED IN LINKING DOCTORS PROJECT

MARLOES I. PRINS, MD GHTM AND SURGICAL REGISTRAR AT ST FRANCIS HOSPITAL, KATETE, ZAMBIA

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Eijkman Medal going global

The term 'global health' did not exist in the time of Christiaan Eijkman (1858–1939), although his work could certainly be seen as representative for the field. In this article, we want to commemorate the life and work of Christian Eijkman, who was awarded the Nobel Prize in 1929 for his invaluable insights into the role of vitamin deficiency and nutrition. This year, the Eijkman Medal will once again be awarded, four years after the previous award. We will also reflect on why we value this tradition, which started with the first medallist in 1929, and share our thoughts on the future of the Fund.

CHICKENS AND PRISONERS

In 1883, the young Eijkman moved to Java with his wife to serve the Dutch military as a medical officer, just after he received his medical degree cum laude from the University of Amsterdam. It was there that he was first confronted with beriberi, a nasty nutritional disorder from which many soldiers suffered, causing peripheral neuropathy, muscle pain and atrophy, cognitive dysfunction, heart failure, and even death. In those days, the germ theory of disease was popular, and Eijkman committed himself to finding what he believed was the microbial causative agent.

However, shortly after his arrival he got malaria, for which he was eventually sent home to recover. Back in the Netherlands, he continued studying beriberi. He travelled to Berlin where he met Robert Koch, who had discovered the tuberculosis bacterium three years earlier and had developed a method to grow bacteria and infect animals. Eijkman worked with Koch for a year and was included in the team of bacteriologist Pekelharing and neurologist Winkler, both of whom were commissioned to study beriberi.

In 1886, Eijkman returned to Batavia where he continued his research on neuritis. As he searched for a micro-organism as the cause of neuritis and to demonstrate Koch's postulates, he injected chickens with blood and urine of beriberi patients. However, the chickens developed polyneuritis independently of what they were injected with. The chickens from both the experimental group and the control group developed the disease, and even sterile chickens that had not been in contact with sick peers did so. But one day, strangely enough, the condition of the affected chickens improved and the disease disappeared. Eijkman found that a change in food – the new cook had changed their diet from left-over white rice to cheap brown rice – cured the chickens from their beriberi-like disease. Nine years later, Eijkman expanded his research to include humans, with the support of Adolph Vorderman, Inspector of Public Health of Java, by surveying inmates in 101 prisons for cases of beriberi. Their research showed that beriberi mortality was about 300-fold higher in prisons that served polished rice.

FROM VITAL AMINE TO VITAMIN

The correlation between beriberi and nutrition was made. Thereafter, developments went fast. In 1898, Sir Frederick Hopkins postulated that some foods contained 'accessory factors' that were vital for the human body, and in 1901, Gerrit Grijns, an assistant and successor to Eijkman, correctly interpreted beriberi as a dietary deficiency of a 'protective nutrient' in the outer hull of rice grains that gets lost during polishing. Between 1910 and 1913, Edward Bright Vedder established that an extract of rice bran is a treatment for beriberi. In 1914 the Polish chemist Casimir Funk coined the name of 'vitamin' from 'vital amine', and in 1926, Jansen and Donath separated the crystalline vitamin B1 in the same laboratory in Batavia.

In 1929, both Eijkman and Hopkins were awarded the Nobel Prize for their discoveries. Christiaan Eijkman and his fellow researchers laid the foundation for vitamin supplementation, and nowadays beriberi is rarely observed, although accurate statistics on the incidence of the condition are no longer available. Beriberi has been reported among refugees who rely on emergency food aid, due to the lack of available micronutrient supplementation. In high-income countries, beriberi is limited to persons with high alcohol intake, people on fad diets, persons on long-term peritoneal dialysis without thiamine replacement, persons undergoing long-term starvation, or persons receiving intravenous fluids with high glucose concentration.

GLOBAL HEALTH RESEARCH AVANT LA LETTRE

In honour of Christiaan Eijkman as one of the founders of modern nutrition, the Eijkman Medal Fund was established on the occasion of his twenty-fifth anniversary as a professor at the University of Utrecht, on 1 October 1923. After the award of the first medal to Dr B Jansen for his research in the Dutch East Indies on the anti-beriberi vitamins in 1927, another 22 years passed before the next medal was awarded (1949). The list of people who were honoured is long. A total of 51 researchers received recognition for their work, predominantly in tropical medicine. Of these, some received the medal for their work as a Director of a Tropical Institute, and in a few cases,

it went to social scientists for their research in medical anthropology or health systems. Sister Barten received the Medal in 1985 for her continued work and inspiration for public health in Indonesia, in particular for mother and child health. She is one of six women among the 51 laureates.

Gradually, the Eijkman Medal Fund has developed into a foundation that aims to promote research in global health, thereby defining global health as 'the area of study, research and practice that places a priority on improving health and achieving equity in health for all people worldwide'. This focus is very much in line with the work of Eijkman, who also addressed what we now would call a 'poverty related disease', as beriberi was very common among the poorer populations in Southeast Asia who ate mostly rice. Because of the new rice-producing machines that were introduced by the Europeans, beriberi was their sure fate. In that sense, Eijkman's work can be seen as global health research *avant la lettre*. Four years after the previous Eijkman Medal ceremony, the Medal will be awarded again during this year's NVTG symposium 'From tropical medicine to global health'.

Over the past years, the Board of the Eijkman Medal Fund has discussed broadening its mission, for example by including research in the field of global health and research being conducted in developing economies. For this, the statutes of the Foundation need adaptation, something which will be done in close collaboration with the Royal Tropical Institute (KIT) and the NVTG, giving them a more prominent role in the Foundation to shape the proposed change. Promoting research in the field of tropical medicine and global health in the Netherlands remains relevant, also in view of the fact that the Dutch government identified health care as one of the top sectors on its research agenda. KIT and NVTG are willing to deploy capacity to support the Foundation in its mission and in efforts to raise funds to safeguard the future of the Eijkman Medal. Promotion of scientific research in the field of global health – including tropical medicine – is still relevant, now perhaps even more so than ever. One of the ways to do so is strengthening the links between the Eijkman Medal Fund and the activities of both organisations. The Board of the Eijkman Medal Fund is looking forward to this new impulse for the Eijkman Medal and all it stands for.

PROF. PAUL R. KLATSER, PHD
PAULKLATSER@GMAIL.COM

DR. MAARTEN A. VAN CLEEFF, MD, PHD
PAUL KLATSER AND MAARTEN VAN CLEEFF ARE MEMBERS OF THE BOARD OF THE EIJKMAN MEDAL FUND

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COLOPHON

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Highlights of the 15th Conference of the International Society of Travel Medicine

The International Society of Travel Medicine (ISTM) is committed to the promotion of healthy and safe travel. This year's ISTM conference was held in Barcelona (May 14-18). Many festive events were organized in this beautiful Spanish city to celebrate ISTM's 25th anniversary. Some highlights of the ISTM conference are presented below.

FEMALE TRAVELLERS

Generally, it is thought that both male and female travellers have an equal risk of developing travel related disease. In fact, sex and gender are often associated with travel health and illness. For example, malaria occurs more in males, while urinary tract infections are more prevalent in women. The research of P. Schlagenhauf-Lawlor shows that women are significantly more likely to develop adverse events after travel vaccination and medication. Future research on new vaccines and drugs should therefore also address the potential association with sex.

RESEARCH ON RABIES IN TRAVELLERS

Many sessions during the conference were focused on rabies vaccination, as discussed by L. Visser, C.A. de Pijper, P. Soentjes, P. Gautret and D. Shlim. Interestingly, D. Shlim demonstrated that the risk of getting rabies was not associated with duration of travel. Travel destination, on the other hand, was found to be an important risk factor. Furthermore, abbreviated rabies schedules were of interest among the research results presented by the previously mentioned speakers. One or two vaccinations, compared to the current three-dose primary schedule, seem to induce adequate antibody titers (>0.5 IU/mL). Other studies on rabies booster vaccination, as presented by L. Visser, P. Sjoentjes, C.A. de Pijper and A.C. Langedijk, indicate that adequate antibody responses are achieved after one year and last even up to ten years or more.

IMMUNOCOMPROMISED TRAVELLERS

A growing number of patients using immunosuppressive medication are travelling nowadays. Good pre-travel care, concerning vaccinations and prophylactics, is even more important in this patient group because of their immunocompromised status, as was demonstrated by H. Hervius Askling. D. Turner indicated the need of pre-travel serology for identifying those patients at risk. Moreover, M. van Aalst added that standby antibiotics should be considered for immunocompromised travellers.

ANNEFLEUR LANGEDIJK
MSC STUDENT INFECTIOUS DISEASES, RESEARCHER CENTER OF TROPICAL MEDICINE AND TRAVEL MEDICINE, ACADEMIC MEDICAL CENTER

Figure 1

Figure 2

PLEURAL EFFUSION, LEADING TO REFERRAL AND CONFUSION

SETTING

This case is taken from a health care facility situation in the highlands of Papua Province, Indonesia. The facility has an outpatient clinic without ward capacity, and has access to basic diagnostic facilities with a laboratory; no X-ray capacity is available. Currently the medical staff consists of a local doctor, four nurses and two consultants. A Dutch medical doctor in tropical medicine assists in the clinic on consultant basis, mostly by advising on difficult cases. The nearby hospital has 4 wards and staff consists of several specialists, including an internist. Common conditions include HIV, tuberculosis, asthma, bronchitis and pregnancy-related issues.

CASE

A 20-year old woman presented with right thoracic pain, fever and nocturnal sweating, which had started five weeks earlier. A week before, she had also developed dyspnoea and a non-productive cough. She had been suffering intermittent chest pains with fever over the course of a few years and had been treated with antibiotics several times with satisfactory results. Recently, she had been treated with cefixime and metronidazole, followed by amoxicillin, salbutamol and prednisone in another clinic.

On physical examination, the patient did not appear ill but was tachypnoeic and dyspnoeic. On pulmonary auscultation, normal breath sounds were heard over the left hemithorax. On the right side however, there were absent breath sounds over the right middle and lower zones. There was no fever or lymphadenopathy. A chest X-ray showed a right-sided pleural effusion in the basal regions of the lung without infiltrates, miliary opacities, cavities or mediastinal lymphadenopathy.

The differential diagnosis included tuberculous pleural effusion, bacterial pneumonia with pleural effusion and pulmonary embolism.

SPECIALIST ADVICE

Internists were consulted to ask for advice on this case. Particularly, the tropical doctor requested advice on differential diagnosis and therapy. Would it be wise to perform a therapeutic thoracocentesis (pleural tap) and to start the patient on empirical anti-tuberculous medication?

The advice was to perform a diagnostic pleural tap to examine the appearance of the pleural fluid. A cloudy fluid sample would suggest an exudate and bacterial empyema, in which case drainage would be indicated. Alternatively, repeated pleural taps combined with antibiotic therapy (amoxicillin and clavulanic acid or clindamycin) could be considered. In the case of a clear exudate, tuberculosis would be more likely, warranting anti-tuberculous therapy. Furthermore, it was advised to test the patient for HIV.

FOLLOW-UP

The patient was referred to a local hospital, where she tested negative on HIV. A pleural tap was not done, because the local internist was afraid of complications and quite convinced that this would be a case of TB. She was started on standard anti-tuberculous medication, after which she gradually improved with reduced dyspnoea and pain. After six months of treatment, an X-ray still showed some pleural effusion, which made the internist decide to continue the anti-tuberculous medication for three more months.

BACKGROUND

PATHOPHYSIOLOGY OF PLEURAL EFFUSION

Physiologic pleural fluid is a transudate. (1) Fluid formation is balanced with drainage capacity, maintaining an estimated volume of 0.1 to 0.2 mL/kg. In case of excess formation or decreased drainage, a pleural effusion can occur.

Pleural effusions can be transudates or exudates. In transudates, high hydrostatic pressure or low oncotic pressure lead to fluid extravasation in the pleural cavity. Examples are heart failure, liver cirrhosis, nephrotic syndrome and hypoalbuminemia. In exudates, vascular hyperpermeability due to an underlying malignancy or inflammation gives rise to plasma leak and fluid accumulation; the most common conditions are infection (tuberculosis, bacterial in-

fection), amoebic liver abscess (by spread though diaphragm) and malignancy.

DIAGNOSTIC APPROACH TO PLEURAL EFFUSION

In a resource-limited setting, a diagnostic tap may be done for appearance of the fluid, total white cell count and differential, protein level and Gram and ZN staining. [2]

The appearance of the fluid can provide useful information: red-brown in amoebic abscess; bloody or chylous in malignancy; straw-coloured in pneumonia or TB; pus in empyema. Raised white blood cell count suggests an exudate; predominantly neutrophils in bacterial infection and lymphocytes in TB, lymphoma and malignancy.

Transudates and exudates can be distinguished from one another using Light's criteria. [1] An exudative pleural effusion fulfils at least one of the following criteria (none in transudate):

1. Pleural fluid / serum protein ratio > 0.5
2. Pleural LDH / serum LDH ratio > 0.6
3. Pleural fluid LDH > two-thirds of the normal upper limit for serum LDH

These criteria have a sensitivity of 98% and a specificity of 74%. [1] There is a relatively large chance of misclassifying a transudate as an exudate, particularly when the patient is using diuretics or when the criteria are only minimally met (ratios just exceeding the limit). (3) Pleural effusions can correctly be classified as transudates if the difference between protein levels in serum and pleural fluid is greater than 3.1 g/dL. A transudate can be ruled out if the protein level is more than 4.0 g/L.

GRAM STAIN SHOULD BE DONE AS WELL AS ZN STAIN, ALTHOUGH THE LATTER HAS LOW SENSITIVITY

Depending on the facilities available, a culture may be obtained. Other parameters include pH, glucose, adenosine deaminase (ADA), amylase, triglycerides, procalcitonin, NT-proBNP and tumour markers. [4] Further diagnostic methods in high-resource settings include serum analysis and urinalysis, pleural biopsy, radiology (chest radiograph and CT-scan), thoracoscopy and bronchoscopy. [3,4]

TREATMENT OF PLEURAL EFFUSION

In most cases of pleural effusion, the underlying cause should be treated. In cases of empyema or severe dyspnea due to large effusions, thoracocentesis should be performed. Pleurodesis (artificial obliteration of the pleural space f.e. chemically) can be beneficial for refractory symptomatic effusion. [1]

PLEURAL EFFUSION IN TUBERCULOSIS

BACKGROUND

Pleural effusion is among the most common extrapulmonary manifestations of TB. Pleuritis occurs in 25% of patients with TB. It was once thought to develop after a subpleural caseous focus in the lung ruptures into the pleural space, followed by a delayed hypersensitivity reaction. [1,5] However, more recently it has been described to be the consequence of direct infection of the pleural space. [6] It can arise after primary infection or reactivation of latent tuberculosis. [5]

CLINICAL FEATURES

Presenting features are an acute febrile illness, pleuritic chest pain and cough. [1,5] Less acute symptoms include dyspnoea, weight loss, night sweating and malaise. [1] The pleural effusion is often unilateral, is characterised by a high protein level (>5 g/dL) and predominantly contains lymphocytes. [5] Compared to serum, it has a similar or reduced glucose level and a high lactic acid dehydrogenase (LDH) level. [5] Pleural fluid pH is >7.30, but can also be reduced. [5]

DIAGNOSTIC CRITERIA

Evidence of mycobacterium in pleural fluid can provide the diagnosis. However, as extrapulmonary TB is paucibacillary, pleural fluid smears and cultures are usually negative in immunocompetent patients. [5] Alternatively, tubercle bacilli can be demonstrated in sputum or pleural biopsy, or granulomas in pleura can lead to the diagnosis. Adenosine deaminase (ADA) and gamma-interferon levels in pleural fluid can be helpful, making TB unlikely in case of ADA <40 IU/l and gamma-interferon <140 pg/mL. [3] In endemic regions, a predominant lymphocytic exudate with a high ADA level can justify treatment initiation. [6]

THERAPEUTIC OPTIONS

Tuberculous effusions are self-limiting, resolving within 6-12 weeks. [5] Anti-tuberculous therapy should always be initiated, as more than 50% of patients will develop active TB over the course of 5 years. [1,3] A standard 6-month anti-tuberculosis regimen should be followed. [5,7] In some patients, paradoxical worsening of the pleural effusion is seen. [1,5] In severely dyspnoeic patients with large effusions, therapeutical thoracocentesis can be performed. If severe systemic symptoms (fever, malaise, chest pains) continue, administration of 80 mg prednisone every other day is recommended; when the symptoms subside, corticosteroids can be tapered. [5] In co-infection with HIV, co-trimoxazole prophylactic therapy should be started, followed by HAART after two weeks of tuberculostatic medication. [2]

ALIES COENDERS – MEDICAL DOCTOR (TROPICAL DOCTOR IN TRAINING)
CONSULTONLINE@TROPENOPLEIDING.NL

WIJNANDA VAN DER BURG – MEDICAL DOCTOR GLOBAL HEALTH AND TROPICAL MEDICINE, WORKING IN INDONESIA, PAPUA PROVINCE

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Introducing the Student forum

FROM THE EDITORIAL BOARD

In this new section of MT*b*, we welcome contributions from (medical) students who at some point during their studies have written a thesis or a paper, for instance as part of a course in tropical medicine or global health, or after an elective, internship or research period abroad. Only abstracts will be published, while the full report will be made available on the NVTG website.

Contributions should have a maximum of 300 words including title, name, affiliation and e-mail address; see also Author Instructions (www.nvtg.org). All contributions will be subject to review by the Editorial Board and selected on the basis of excellence, relevance and style.

IN DEVELOPING COUNTRIES, HOSPITALS AND THEIR PATIENTS HARDLY PROFIT FROM INTERNATIONAL MEDICAL STUDENTS DOING INTERNSHIPS

ANNE VLAK

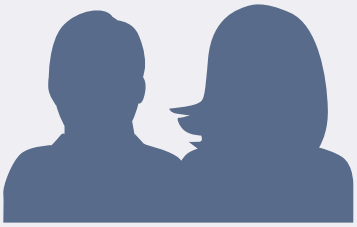
1ST YEAR STUDENT ERASMUS MC, ROTTERDAM, THE NETHERLANDS

ANNEVLAK@LIVE.NL

Report for STOLA course on Tropical Medicine 2016

ABSTRACT

A short-term medical internship is popular amongst medical students. The benefits for students include a chance to experience another culture, learn a new language and gain some practical experience. Unfortunately, the advantages to the receiving hospital and their patients are less clear, and there are many downsides to these internships. Students are often underprepared for the circumstances in which they will work and problems they will face, such as ethical dilemmas that arise in a low-resource setting, obtaining informed consent in another language or diagnosing locally endemic diseases. Additionally, students are sometimes asked to carry out treatment independently that they are not yet qualified for in their home country. This leads to higher risks for the patient. Finally, medical staff need a lot of time to explain procedures to incoming students, while they are busy with other tasks. Some recommendations for solving these problems are: abolishing short-term internships in favour of longer lasting internships; offering internships abroad later on in the study, when students are more experienced; offering internships in the form of exchanges, so that foreign medical students will get a chance to gain experience in the Netherlands; and explicitly prohibiting students from doing procedures for which they are not qualified. More awareness regarding the downsides to medical internships abroad is needed.



THE NEED FOR MENTAL HEALTH SCREENING OF REFUGEE CHILDREN IN THE NETHERLANDS

EMMA DOGTEROM

6TH YEAR STUDENT ERASMUS MC, ROTTERDAM, THE NETHERLANDS

EMMADOGTEROM@GMAIL.COM

Report for STOLA course on Tropical Medicine 2016

ABSTRACT

Sixty thousand refugees applied for asylum in the Netherlands in 2015. Roughly one third of them are children. A lot of these children have fled from a warzone and may have experienced traumatic events. These children therefore have an increased risk of developing psychological problems. In this article, I advocate for mental health screening of all refugee children based on questionnaires, based on the following arguments.

Mental health screening is necessary because all children are entitled to the best medical help regardless of their nationality, financial situation or residence permit, under the Children's Convention of the United Nations and the reception standards for under-age refugees in the European Union.

This screening will enable an earlier detection and treatment of the psychological problems that refugee children might have. This will not only result in a reduction of subsequent consequences for the refugee children, but also in a reduction of financial costs for Dutch society.

Finally, psychometrical research shows that questionnaires are reliable as a first step in the detection of psychological problems. Questionnaires also have the advantage that they cause fewer communication problems, involve multiple respondents in the investigation, thereby improving their validity, and are cheaper than conducting interviews.

I also address the controversy in academic literature about the cross-cultural validity of psychiatric diagnoses worldwide, as this might present a counterargument against my thesis that mental health screenings should be performed. I point to a recent review of Hinton et al. which concludes that, based on biomarkers, epidemiological studies and factor analysis, the diagnosis of PTSD is valid worldwide.

My recommendation is to implement mental health screening for all refugee children. Questionnaires can be downloaded for free from: http://www.childrenandwar.org.

FULL ARTICLES (IN DUTCH) AT WWW.NVTG.ORG

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President: A.A.L.J. (Ankie) van den Broek
Secretary: M.G.P. (Marieke) Lagro
Secretariat: J.C. (José) Hoppenbrouwer
P.O. Box 82
3738 ZM Maartensdijk
The Netherlands
+31(0)6-53515773
info@nvtg.org
www.nvtg.org