

Infektions- und Tropenmedizin – International Health  
Gesundheitsbedarfe in Ländern mit niedrigem und mittlerem  
Durchschnittseinkommen

Enabling Researchers in Low- and Middle-Income-Countries to Define their  
Local Health Research Agenda

aus der

Medizinische Klinik und Poliklinik IV

Abteilung für Infektions- und Tropenmedizin

Habilitationsschrift zur Erlangung des akademischen Grades eines habilitierten Doktors der  
Medizin an der Ludwig-Maximilians-Universität München

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## Introduction

Health for all in all its forms is a maxim which was coined in the Alma Ata Declaration and which was laid down in the Millennium Development Goals and since 2015 in the Sustainable Development Goals as a contractually binding goal of the signatory states<sup>1</sup>. After the phase of the dissolution of the blocs of states in the 1990s followed a phase of reorientation which has continued to this day and in which particular dynamic developments took place. The People's Republic of China has assumed the position of the largest market economy, and with projects such as the Road and Belt Initiative has had a decisive influence on Low and Middle Income Countries (LMICs) in Asia and Africa. The government of the United States of America is in a state of retreat with relevant cuts in development cooperation<sup>2</sup>, and the European Union lacks a coherent development cooperation strategy. Both in specialist literature and in the political media, Germany is ascribed a role in this period that should provide orientation and also be a competent leader<sup>3</sup>. At present, however, there is a lack both of corresponding German specialists and of a coherent strategy for effective projects, of partnerships with LMICs at eye level, and of concepts for empowering specialists and researchers from LMICs. Particular attention has also been paid to health issues in the context of global security, as evidenced by the Ebola epidemic in West Africa 2014 - 2016 and the Zika epidemic in the Pacific region and Latin America (World Health Organization's call for a Public Health Emergency of International Concern 2014 and 2016)<sup>4,5</sup>. In the context of a reorientation of German development cooperation, various initiatives are currently being developed, such as the Schnell Einsetzbare Experten-Gruppe

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<sup>1</sup> <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

<sup>2</sup> [https://www.washingtonpost.com/news/monkey-cage/wp/2018/02/22/trump-wants-to-cut-immigration-and-foreign-aid-heres-how-theyre-connected/?noredirect=on&utm\\_term=.93c28be4ff6d](https://www.washingtonpost.com/news/monkey-cage/wp/2018/02/22/trump-wants-to-cut-immigration-and-foreign-aid-heres-how-theyre-connected/?noredirect=on&utm_term=.93c28be4ff6d)

<sup>3</sup> Kickbusch I, Franz C, Holzscheiter A, Hunger I, Jahn A, Köhler C, Razum O, Schmidt JO. Germany's expanding role in global health. *Lancet*. 2017 Aug 26;390(10097):898-912. doi: 10.1016/S0140-6736(17)31460-5. Epub 2017 Jul 3. Review. PubMed PMID: 28684024.

<sup>4</sup> <https://www.who.int/mediacentre/news/statements/2014/ebola-20140808/en/>

<sup>5</sup> [https://www.who.int/news-room/detail/01-02-2016-who-statement-on-the-first-meeting-of-the-international-health-regulations-\(2005\)-\(ihr-2005\)-emergency-committee-on-zika-virus-and-observed-increase-in-neurological-disorders-and-neonatal-malformations](https://www.who.int/news-room/detail/01-02-2016-who-statement-on-the-first-meeting-of-the-international-health-regulations-(2005)-(ihr-2005)-emergency-committee-on-zika-virus-and-observed-increase-in-neurological-disorders-and-neonatal-malformations)

(SEEG) of the Gesellschaft für Internationale Zusammenarbeit (GIZ), or the Global Health Strategy of the German Government. A special position is taken here by academic institutions, most of which are experts in the field of infectiology, or by separate working groups, e.g. on the Federal Government's Global Health Strategy.

A central element of the various initiatives in the field of global health, but also of the German Ministry for Economic Cooperation and Development as part of its Africa Strategy<sup>6</sup>, is the empowerment of local structures in LMICs to provide adequate health care for the respective populations at stake and to independently design solutions to overcome deficits in health care. At the same time, priorities need to be set for health issues (e.g. balance between traditional vertical programs such as tuberculosis and malaria control, and horizontal programs such as antibiotic stewardship or combating non-communicable diseases).

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<sup>6</sup> [http://www.bmz.de/de/mediathek/publikationen/reihen/strategiepapiere/Strategiepapier344\\_06\\_2014.pdf](http://www.bmz.de/de/mediathek/publikationen/reihen/strategiepapiere/Strategiepapier344_06_2014.pdf)

## **Aims and Objectives**

The aim of the habilitation project is to enable local resources in LMICs to solve health problems by integrating health research and capacity development of experts and researchers. Is it possible to collaboratively discuss local issues, jointly generate adequate projects, and then implement them locally? Can high-quality scientific contributions be generated? Can local experts be empowered in such a way that they can independently advance health care and health research?

For the applicant, the habilitation project therefore consists of two areas: capacity development projects (teaching and training) and research projects. The scientific papers cited for this habilitation are predominantly products of capacity development cooperation. The questions of sustainable empowerment are discussed in the section "Research Projects" on the basis of individual case studies, as the environmental conditions can vary greatly.

At the same time, it is the aim of the applicant's activities to propagate the internationalisation of the KUM and the LMU Munich and to contribute to the positioning of the universities and sciences within the framework of the promotion of global health.

## Capacity Development-Projects

### ***CIH<sup>LMU</sup> Center for International Health***

Problem: The lack of specialists and researchers in LMICs was identified by the WHO in 2006 in the World Health Report as an elementary obstacle to development <sup>7</sup>. The international research projects conducted at the Division of Infectious Diseases and Tropical Medicine have also shown that structured and strategic training and further education of local employees is problematic, as locally adequate training formats are hardly available and overseas training often goes hand in hand with leaving the region (brain drain).

Project: In 2009 the CIHLMU was founded by a group of institutions of the University Hospital of Munich, among them the Tropical Institute. The aim of the CIHLMU is to design education and training formats that meet the local needs of the various partners in LMICs. In addition, attention should be paid to the local design of research agendas.

Result: In 2009, the CIHLMU successfully obtained funding from the DAAD and BMZ within the framework of the exceed - Excellence in Higher Education in Development Cooperation call (annual budget 1 million euros over 5 years). In 2015 and in 2019 extensions of further 5 year periods were obtained, currently running until 2024. Since 2009, the CIHLMU has developed into a world-renowned institution, with Master and PhD-level education programs, as well as numerous short programs on various topics in the field of international and global health. The applicant is currently a board member of the CIHLMU<sup>8</sup>.

### ***Teaching & Training Unit at the Division of Infectious Diseases and Tropical Medicine***

Problem: The teaching volume at the Division of Infectious Diseases and Tropical Medicine has increased significantly over the past decade. The portfolio of training offers includes formats for the undergraduate sector (MECUM), a Master's and a PhD program in

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<sup>7</sup> [www.who.int/workforcealliance/about/hrh\\_crisis/en](http://www.who.int/workforcealliance/about/hrh_crisis/en)

<sup>8</sup> [https://www.international-health.uni-muenchen.de/about\\_cih/index.html](https://www.international-health.uni-muenchen.de/about_cih/index.html)

International Health, as well as special training modules. In addition, all doctorates are structured at the Division of Infectious Diseases and Tropical Medicine.

Project: The Teaching & Training Unit (T&TU) was founded in 2017 to support and harmonise the various teaching activities of the Division of Infectious Diseases and Tropical Medicine.

Result: The T&TU is currently responsible for 13 MECUM teaching modules, as well as for 9 annual Advanced Modules in English on various topics of international health. In addition, the T&TU coordinates the PhD program Medical Research - International Health and the Master's program Master of Science in International Health<sup>9</sup>.

### ***PhD Programm Medical Research – International Health***

Problem: The problems of poor prospects for promising researchers have already been addressed earlier in this section. The aim was to offer the personalities in the LMICs' research landscapes an internationally recognised doctoral opportunity in the form of leaders, junior researchers and multipliers and at the same time to counteract emigration from their home countries.

Project: From BMZ/DAAD exceed funds<sup>10</sup>, which were acquired in 2009, the PhD program Medical Research - International Health was launched in October 2010. The program has a sandwich structure that allows PhD candidates to realize their own research ideas and implement them in cooperation with local and LMU supervisors. The research phases in the home countries are only briefly interrupted by attendance phases within the framework of compulsory modules.

Result: The applicant was involved in the development of the PhD program Medical Research - International Health in a leading position. The program has been able since 2010 to enrol more than 100 PhD candidates<sup>11</sup>. Except for one alumna, there was no immigration of graduates to Germany. Numerous follow-up projects with the alumni could be recruited,

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<sup>9</sup> [https://www.international-health.uni-muenchen.de/about\\_cih/focus\\_areas/trop-medicin/index.html](https://www.international-health.uni-muenchen.de/about_cih/focus_areas/trop-medicin/index.html)

<sup>10</sup> [www.daad.de/exceed](http://www.daad.de/exceed)

<sup>11</sup> [https://www.international-health.uni-muenchen.de/education/phd\\_med\\_research/index.html](https://www.international-health.uni-muenchen.de/education/phd_med_research/index.html)

in addition numerous graduates are represented in key positions in their home countries, e.g. as head of research department at a university in Mozambique, as head of a research institute in Tanzania, as department head of a microbiology department of a university in Ethiopia or as head of a research group in Brazil. The gender distribution of > 50% women is conducive to the empowerment of women in science in LMICs. In addition, the PhD program is the first PhD program at the Faculty of Medicine, and is hence taking a pioneering role in the structuring of doctoral theses. In addition, it contributes to the international visibility of the Clinic of the University of Munich and the LMU.

### ***Master of Science in International Health***

Problem: The further development of health systems in LMICs requires correspondingly professional specialists. Humanitarian organisations as well as entities of development cooperation have complained in the past about the inadequate qualification of personnel employed (example on the part of the International Committee of the Red Cross<sup>12</sup>).

Project: In 2018, the Master of Science in International Health was established at the Tropical Institute. Basic knowledge in the field of health research, epidemiology and solution strategies is imparted.

Result: The establishment of the course of studies was approved by the Faculty Council and the University Senate and was carried out in October 2018<sup>13</sup>. So far, five Master candidates could be enrolled in the program. In the following years, a maximum of ten places per year are expected to be fully occupied.

The Master's program is also advertised in the worldwide network tropEd (Higher Education Institutions in International Health) and is subject to the strict quality assurance and control criteria established there. The tropEd network comprises 18 higher education institutions on all continents, in which 8 Master's programs and 117 course modules in International Health

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<sup>12</sup> <https://www.icrc.org/en/doc/resources/documents/article/review-2011/irrc-884-walter-russ.htm>

<sup>13</sup> [https://www.international-health.uni-muenchen.de/education/master\\_programs/msc\\_int\\_health/index.html](https://www.international-health.uni-muenchen.de/education/master_programs/msc_int_health/index.html)

are offered annually<sup>14</sup>. The applicant currently represents the Division of Infectious Diseases and Tropical Medicine on the board of the tropEd network. In addition, the applicant has been elected Secretary General of the tropEd network in 2019, and the tropEd Secretariat has been transferred from the Swiss Tropical Institute in Basel (Swiss TPH) to the Division of Infectious Diseases and Tropical Medicine in Munich.

### ***Advanced Modules in International Health***

Problem: The professionalization of specialists in international health requires differentiated training. Special training formats are required for the various areas of application in development cooperation.

Project: Various special modules have been designed since 2010 using BMZ/DAAD exceed funding acquired in 2009. The requirements of various organisations or partner institutions in LMICs were also addressed.

Result: Since 2010, more than 10 modules have been designed<sup>15</sup>. The modules last from a few days to weeks and are offered not only at the LMU in Munich, but also at various partner institutions, such as Ethiopia, Tanzania, Ghana or Nepal. The vast majority of modules are offered once a year and on an ongoing basis. The topics cover a broad spectrum from clinical topics such as ultrasound diagnostics or infection diagnostics, to method courses such as Qualitative Research, to policy courses such as Access to Medicines or Public Health in Nepal. Most modules are still ongoing on a yearly basis.

### ***Stärkung von Forschungseinrichtungen und Forschern***

Problem: Well-trained specialists need perspectives in order to be able to implement their ideas on site and to inspire other, young employees for education and science. A lack of such perspectives is a frequent reason for emigration.

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<sup>14</sup> [www.troped.org](http://www.troped.org)

<sup>15</sup> [https://www.international-health.uni-muenchen.de/education/short\\_term\\_courses/advanced\\_modules\\_int\\_health/index.html](https://www.international-health.uni-muenchen.de/education/short_term_courses/advanced_modules_int_health/index.html)



Project: The BMZ/DAAD exceed funding has generated seed funds (network funds), which are currently advertised annually by the CIHLMU and awarded to innovative and promising local network projects.

Result: Since 2015, more than 10 projects have been funded from the CIHLMU Network Funds, and the fresh graduates of the various training programs in particular have been able to gain their own early research funding experience. The applicant is involved in the selection process as a board member of the CIHLMU. Currently, a research project in the field of microbiology in Ethiopia on the causes of neonatal sepsis is also supervised by the applicant.

## Research Projects

In the following, important fields of research are presented as examples. These represent the result of the acquisition of new research fields by the capacity development projects. In addition, there are other research activities which are not discussed in detail here.

### ***Arboviroses***

**Problem:** The entire tropical subtropical belt is affected by endemic or epidemic mosquito-borne virus infections, which cause high morbidity and economic losses in the affected countries. For example, the Pacific region and Latin America were affected by a Zika virus epidemic between 2013 and 2016. In addition to acute febrile diseases, foetal malformations during pregnancy were particularly important for public health systems. In addition, dengue virus infections with, for example, an estimated 2 million cases in Brazil in 2013, cause high morbidity, associated with corresponding mortality of severe dengue forms, especially in children.

**Project:** Within the framework of an economic study, the applicant could describe in the province Espirito Santo in Brazil the risk of infection and the outbreak dynamics in different districts in the outbreak period 2012/2013 of dengue serotype 4.

During the peak of the Zika outbreak in the years 2015 to 2016, the risk of infection was relevant for German travellers, especially those wishing to have children in near future time. The applicant conducted a case study on the persistence of Zika virus in male semen in a vasectomized patient that had presented as a patient at the outpatient department of the Division of Infectious Diseases and Tropical Medicine.

**Result:** The economic Dengue study in Espirito Santo in Brazil showed that districts with a particularly high risk of infection were those in which the population density was high and the average income low. On the other hand, a particularly high relative prevalence amplitude was found in districts with a high average income<sup>16</sup>. The study was carried out as

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<sup>16</sup> Vicente CR, Herbinger KH, Cerutti Junior C, Malta Romano C, de Souza Areias Cabidelle A, Fröschl G. Determination of clusters and factors associated with dengue dispersion during the first epidemic related to Dengue virus serotype 4 in Vitória, Brazil. PLoS One. 2017 Apr 7;12(4):e0175432. doi:

part of a doctoral project of the PhD program Medical Research - International Health. The PhD Alumna of the program has also successfully acquired a DAAD Research Fellowship and is now a holder of a professorship in Espirito Santo.

The Zika case study demonstrated that viable Zika virus is also present in a vasectomized patient with proven lack of sperm excretion in the ejaculate<sup>17</sup>. In addition, it could be shown that, contrary to the prevailing assumption at that time, whole blood contains Zika virus DNA much longer than serum or urine. As a result, whole blood was established as a type of sample for routine diagnostics at the division. International guidelines for the diagnosis of Zika virus infections have also been adapted accordingly as a result of comparable results from different research groups<sup>18</sup>.

### ***Antimicrobial Resistances***

Problem: Antibiotics are an elementary pillar in the fight against infectious diseases, which continue to lead the causes of morbidity and mortality in LMICs, but also play an important role in the ageing population of high-income countries. The development of antimicrobial resistances (AMR) threatens the control of infectious diseases, and is a global phenomenon that calls for corresponding global interventions. AMR, for example, was declared a central concern in the field of health care by political decision-makers at the G7 and G20 summits.

Project: In 2017, the applicant successfully obtained research funding from both the BMZ and the BMBF on the subject of AMR. In addition to the prevalence of germ and resistance spectra, the responsible use of diagnostics and therapeutics at the partner institutions

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10.1371/journal.pone.0175432. eCollection 2017. PubMed PMID: 28388694; PubMed Central PMCID: PMC5384768.

<sup>17</sup> Froeschl G, Huber K, von Sonnenburg F, Nothdurft HD, Bretzel G, Hoelscher M, Zoeller L, Trottmann M, Pan-Montojo F, Dobler G, Woelfel S. Long-term kinetics of Zika virus RNA and antibodies in body fluids of a vasectomized traveller returning from Martinique: a case report. *BMC Infect Dis.* 2017 Jan 10;17(1):55. doi: 10.1186/s12879-016-2123-9. PubMed PMID: 28068904; PubMed Central PMCID: PMC5223480.

<sup>18</sup> [https://wwwnc.cdc.gov/eid/article/25/7/18-2000\\_article](https://wwwnc.cdc.gov/eid/article/25/7/18-2000_article)

Jimma University Medical Centre in Jimma, Ethiopia and Mbeya Zonal Referral Hospital in Mbeya, Tanzania are to be investigated and improved<sup>19</sup>.

Result: It was found that there was no effective use of microbiological diagnostics in both Jimma and Mbeya. In both facilities, elementary diagnostic measures such as resistance testing by disc diffusion tests could not be performed due to lack of training of staff and reagents. In addition, there were preclinical process deficits which led to improper storage of the samples (up to 3 days at room temperature). Training modules on AMR were carried out both in Jimma and in Mbeya. Sample collections are currently being carried out in both facilities as part of studies on germ and resistance spectra in routine samples.

### ***Health Systems Research***

Problem: Deficit health systems are regarded by the WHO as the cause of various global health problems, especially in LMICs. The limited efficiency of the public health system, as well as poor access for the general population, can prevent the improvement of mother-child health, hinder the care of chronic non-communicable diseases, and promote outbreaks such as the Ebola epidemic 2014 - 2016.

Project: In Bangladesh, a diabetes and health information project was carried out as part of a PhD doctorate. In Ethiopia, an assessment tool is being designed locally in the Jimma region to quantify the performance of the health care system. At the same time, qualitative methods were used to define key competencies of health care facilities at district level. In the very young state of Kosovo, the effect of informal private co-payment on private households was measured as part of the introduction of a health insurance system.

Result: In Bangladesh it was found that almost half of the diabetes mellitus type II patients cared for were poorly adjusted: 44.5% of the 515 diabetics had HbA1c > 8%, 62.6% had BMI >= 25, and 90.5% had complications<sup>20</sup>. In Ethiopia, 11 key competencies of district health

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<sup>19</sup> <https://www.giz.de/de/weltweit/41578.html>

<sup>20</sup> Islam SM, Alam DS, Wahiduzzaman M, Niessen LW, Froeschl G, Ferrari U, Seissler J, Rouf HM, Lechner A. Clinical characteristics and complications of patients with type 2 diabetes attending an urban hospital in Bangladesh. *Diabetes Metab Syndr.* 2015 Jan-Mar;9(1):7-13. doi: 10.1016/j.dsx.2014.09.014. Epub 2014 Oct 13. PubMed PMID: 25450814.

facilities were defined in the context of the qualitative survey of specialists, e.g. survey of health determinants in the target population, ensuring equal access to the health system or development of personnel competencies. In addition, an instrument for recording the range of services provided by the health care system is being developed using a multi-stage Delphi survey procedure among skilled workers. The final phase of the instrument's construction has now been completed with the validation of 59 indicators. This should enable a standardised assessment of the performance of the system at different levels. In Kosovo, it was found that 80% of households continue to make informal private co-payments. Treatments abroad were particularly harmful for private households, accounting for 1.1% of households. The poverty rate of 20.7% determined in the survey was increased by 7.3% through health payments alone<sup>21</sup>.

### ***Migration and Health***

**Problem:** According to the UNHCR, 68.5 million people were in refuge in 2018, more than 25 million of them cross-border<sup>22</sup>. In the same year there was a significant increase in immigration to Germany. Health care for people with a migration background, especially refugees, is in deficit in Germany<sup>23</sup>.

**Project:** Within the framework of a Master of Science in International Health research project, the morbidity and care needs of unaccompanied minors were examined at three institutions in Bavaria in the period from October 2014 to February 2016.

Furthermore, in 2018, in cooperation with Doctors of the World, Germany, a data analysis was carried out on their treatment data of 1,096 persons without sufficient insurance coverage treated in Germany in 2017 (Berlin, Hamburg and Munich sites only).

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<sup>21</sup> Arenliu Qosaj F, Froeschl G, Berisha M, Bellaqa B, Holle R. Catastrophic expenditures and impoverishment due to out-of-pocket health payments in Kosovo. *Cost Eff Resour Alloc.* 2018 Jul 28;16:26. doi: 10.1186/s12962-018-0111-1. eCollection 2018. PubMed PMID: 30069165; PubMed Central PMCID: PMC6064180.

<sup>22</sup> <https://www.unhcr.org/figures-at-a-glance.html>

<sup>23</sup> Bauhoff S, Göppfarth D. Asylum-seekers in Germany differ from regularly insured in their morbidity, utilizations and costs of care. *PLoS One.* 2018;13(5):e0197881. Published 2018 May 24. doi:10.1371/journal.pone.0197881

Results: 154 unaccompanied minor refugees underwent an initial examination at the participating institutions. This revealed a medical need of 87.7%, the two leading diagnoses were skin diseases and psychiatric diagnoses (suspected post-traumatic stress disorders). The lack of guidelines and uniform recording instruments during the initial examinations was conspicuous. The results were published by BMC Public Health.<sup>24</sup>

The data evaluation of the treatment data of 1,096 patients from Doctors of the World revealed a proportion of 18.7% children and adolescents under the age of 20 in the patient cohort. In addition, 22.4% (88/393) of adult women were pregnant. Of all patients, 96.3% lived below the poverty line (€ 1,033 per person per month). The countries of origin were Germany with 7.6%, EU countries (except Germany) with 56.7% and third countries with 35.7%<sup>25</sup>. The results were published in a special report „Verwehrtes Recht auf Gesundheit“ which was forwarded to the German Government and the United Nations<sup>26</sup>. The results were particularly regarded at a meeting of the Lancet Commission on Migration and Health in Berlin in December 2018<sup>27</sup>.

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<sup>24</sup> Kloning T, Nowotny T, Alberer M, Hoelscher M, Hoffmann A, Froeschl G. Morbidity profile and sociodemographic characteristics of unaccompanied refugee minors seen by paediatric practices between October 2014 and February 2016 in Bavaria, Germany. BMC Public Health. 2018;18(1):983. Published 2018 Aug 7. doi:10.1186/s12889-018-5878-7

<sup>25</sup> <https://www.aerztewelt.org/presse-und-publikationen/publikationen/2018/12/12/verwehrtes-recht-auf-gesundheit-krank-und-ohne-medizinische-versorgung-deutschland>

<sup>26</sup> [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(19\)30245-4/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)30245-4/fulltext)

<sup>27</sup> <https://www.migrationandhealth.org/launch-events>

## **Outlook**

At the time of the submission of the habilitation thesis, the following projects are still underway:

### ***Arboviroses***

At present, a comprehensive data set on Zika virus infections in returnees, who were cared for in the outpatient department of the Division of Infectious Diseases and Tropical Medicine, is being evaluated. A retrospective analysis of the incidence of the virus infection in travellers, stratified according to different global regions, as well as a phylogenetic analysis will be presented, which will shed light on the distribution pathways of the Zika virus on the basis of the collective of travellers returning home.

### ***Antimicrobial Resistances***

The above mentioned projects on antimicrobial resistances in Ethiopia and Tanzania, which are funded by BMZ and BMBF, did run until September 2019. Several publications are expected on prevalence of indicator bacteria and their antibiotic resistances in hospital patient groups as well as in healthy citizens. In addition, fresh and waste water samples as well as swabs and faecal samples from farm animals will be analysed. The activity is thus a showcase project for the one-health approach, in which the inseparability of environmental, veterinary and human medicine is established<sup>28</sup>. The project is carried out in the context of a larger network of German universities and their African partners. A further promotion of activities in the field of antimicrobial resistance has already been laid out by various German and European third-party donors.

### ***Health Systems Research***

The above-mentioned project on health system financing in Kosovo has led to feedback to the Ministry of Health and the World Bank. Further steps towards political implementation are expected here. The postdoc continues to work for the World Bank and the Ministry of Health in Kosovo, which makes it easier to monitor the impact of the research results. A

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<sup>28</sup> <https://www.who.int/features/qa/one-health/en>

research project is currently being developed to evaluate a health insurance system in Kosovo and to submit the WHO call "Research on Citizen Responsiveness and Empowerment in Health Insurance Programs". The project to analyse the performance of public health institutions in a region of Ethiopia is still in the data collection phase, and the results are expected to be taken into account by the regional health authorities.

### ***Humanitarian Aid and Development Cooperation***

The Department of Infection and Tropical Medicine has extensive cooperation experience in the field of humanitarian aid and development cooperation. The completed projects were carried out with organisations such as the Red Cross, Doctors Without Borders or Doctors of the World. Since 2016, the successful Humanitarian Symposium Munich has been held at the LMU Munich under the leadership of the applicant<sup>29</sup> (booked out annually with up to 110 participants), which is by now a well-respected counterpart to the Humanitarian Congress Berlin. The extensive exhibitor area also serves as a project exchange for numerous particularly young participants.

In cooperation with Doctors of the World, the applicant is currently responsible for the data evaluation of three mobile treatment facilities in Hamburg, Berlin and Munich, from which a status report on the health care of marginalised groups of people in Germany is drawn up annually, with over 4000 consultations annually<sup>30</sup>.

For the Red Cross as well as for the Gesellschaft für Internationale Zusammenarbeit (GIZ) the applicant is represented in pools for quickly deployable experts. In this context, the applicant was also released from the KUM and employed in an Ebola treatment facility as Medical Director 2014/2015.

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<sup>29</sup> <https://www.international-health.uni-muenchen.de/activities/symposia-series/symp-series-humanitarian/index.html>

<sup>30</sup> <https://www.aerztewelt.org/presse-und-publikationen/publikationen/2018/12/12/verwehrtes-recht-auf-gesundheit-krank-und-ohne-medizinische-versorgung-deutschland>



## ***Capacity Development***

At the time this manuscript was submitted, the Teaching & Training Unit at the Division of Infectious Diseases and Tropical Medicine level assumed responsibility for all teaching and training activities at the division. At the same time, the CIHLMU has been transformed into a centre at the University Hospital, LMU Munich and serves as a coordinating body for international health activities of various actors at the hospital as well as at other faculties of the LMU. The training formats PhD Program Medical Research - International Health, the advanced modules in International Health and the certificate course Diploma in Tropical Medicine and International Health are consolidated. The MSc International Health master course was established in October 2018 and is ongoing with an annual intake in October. Various key individuals have established themselves as alumni of the PhD program in the research and policy landscapes of various partner countries such as Ethiopia (Jimma University Medical Center), Tanzania (Director Mbeya Medical Research Center) or Kosovo (Ministry of Health). This has made a significant contribution to LMU's internationalisation and development cooperation efforts. The Ludwig-Maximilians-Universität München is now regarded as an important player in the field of Global Health in Germany and Europe, not least due to the activities mentioned above.

Günter Fröschl, Munich, 03 March 2020

## Publikationen

### A) Originalarbeiten als Erst- oder Letztautor

- 1    Authors                      Kangbai JB, Heumann C, Hoelscher M, Sahr F, **Froeschl G**

    Title                            Epidemiological characteristics, clinical manifestations, and treatment outcome of 139 pediatric Ebola patients treated at a Sierra Leone Ebola Treatment Center

    Journal/ Impact                BMC Infectious Diseases, 2019/ IF 2017: 2.62  
    Factor
  
- 2    Authors                      Kloning T, Nowotny T, Alberer M, Hoelscher M, Hoffmann A, **Froeschl G**

    Title                            Morbidity profile and sociodemographic characteristics of unaccompanied refugee minors seen by paediatric practices between October 2014 and February 2016 in Bavaria, Germany

    Journal/ Impact                BMC Public Health, 2018/ IF 2017: 2.42  
    Factor
  
- 3    Authors                      **Guenter Froeschl**, Marcus Beissner, Kristina Huber, Gisela Bretzel, Michael Hoelscher, Camilla Rothe

    Title                            Plasmodium knowlesi infection in a returning German traveller from Thailand: a case report on an emerging malaria pathogen in a popular low-risk travel destination

    Journal/ Impact                Eurosurveillance, 2018/ IF 2017: 7.13  
    Factor
  
- 4    Authors                      **Guenter Froeschl**, Elmar Saathoff, Inge Kroidl, Nicole Berens-Riha, Petra Clowes, Leonard Maboko, Weston Assisya, Wolfram Mwalongo, Martina Gerhardt, Elias Nyanda Ntinginya, Michael Hoelscher

    Title                            Reduction of Malaria Prevalence after Introduction of Artemisinin-Combination-Therapy in Mbeya Region, Tanzania. Results from a Cohort Study with 6,773 Participants.

- Journal/ Impact  
Factor Malaria Journal, 2018/ IF 2017: 2.85
- 5 Authors Tanaka LF, Latorre MD, Gutierrez EB, Heumann C, Herbinger KH, **Froeschl G**
- Title Trends in the incidence of AIDS-defining and non-AIDS-defining cancers in people living with AIDS: a population-based study from São Paulo, Brazil
- Journal/ Impact  
Factor International Journal of STD and AIDS, 2017/ IF: 1.49
- 6 Authors Vicente CR, Herbinger KH, Cerutti Junior C, Malta Romano C, de Souza Areias Cabidelle A, **Fröschl G**
- Title Determination of clusters and factors associated with dengue dispersion during the first epidemic related to Dengue virus serotype 4 in Vitoria, Brazil
- Journal/ Impact  
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- 7 Authors Janke C, Heim KM, Steiner F, Massaquoi M, Gbanya MZ, Frey C, **Froeschl G**
- Title Beyond Ebola treatment units: severe infection temporary treatment units as an essential element of Ebola case management during an outbreak
- Journal/ Impact  
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- 8 Authors Girma E, Möller-Leimkühler AM, Dehning S, Mueller N, Tesfaye M, **Froeschl G**
- Title Self-stigma among caregivers of people with mental illness: toward caregivers' empowerment
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B) Originalarbeiten als Koautor

- 1 Authors Turebekov N, Abdiyeva K, Yegemberdiyeva R, Dmitrovsky A, Yeraliyeva L, Shapiyeva Z, Amirbekov A, Oradova A, Kachiyeva Z, Ziyadina L, Hoelscher M, **Fröschl G**, Dobler G, Zinner J, Frey S, Essbauer S

Title Prevalence of Rickettsia species in ticks including identification of unknown species in two regions in Kazakhstan.

Journal/ Impact Factor Parasites and Vectors, 2019/ IF 2018: 3.03
- 2 Authors Yesuf EA, Grill E, **Fröschl G**, Koller D, Haile-Mariam D

Title Administrators, Health Service Providers, and Consumers Perspectives of Functions of District Healthcare Systems in Oromia Region, Ethiopia: A qualitative study

Journal/ Impact Factor The International Journal of Health Planning and Management, 2019/ IF 2017: 0.98
- 3 Authors Weinmann T, AlZahmi A, Schneck A, Mancera Charry JF, **Fröschl G**, Radon K

Title Population-based assessment of health, healthcare utilisation, and specific needs of Syrian migrants in Germany: what is the best sampling method?

Journal/ Impact Factor BMC Medical Research Methodology, 2019/ IF 2017: 2.52
- 4 Authors Espinosa Aranzales AF, Radon K, **Fröschl G**, Pinzón Rondón ÁM, Delius M

Title Prevalence and risk factors for intestinal parasitic infections in pregnant women residing in three districts of Bogotá, Colombia

Journal/ Impact Factor BMC Public Health, 2018/ IF 2017: 2.42
- 5 Authors Arenliu Qosaj F, **Fröschl G**, Berisha M, Bellaqa B, Holle R

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- payments in Kosovo
- Journal/ Impact Factor Cost Effectiveness and Resource Allocation, 2018/ IF 2017: 1.79
- 6 Authors Vicente CR, Pannuti CS, Urbano PR, Felix AC, Cerutti Junior C, Herbinger KH, **Fröschl G**, Romano CM
- Title First phylogenetic analysis of dengue virus serotype 4 circulating in Espírito Santo state, Brazil, in 2013 and 2014
- Journal/ Impact Factor Epidemiology and Infection, 2018/ IF 2017: 2.04
- 7 Authors Tanaka LF, Latorre MDRDO, Gutierrez EB, Curado MP, Dal Maso L, Herbinger KH, **Froeschl G**, Heumann C
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- Journal/ Impact Factor International Journal of Cancer, 2018/ IF 2017: 7.36
- 8 Authors Vicente CR, Herbinger KH, **Fröschl G**, Malta Romano C, de Souza Areias Cabidelle A, Cerutti Junior C
- Title Serotype influences on dengue severity: a cross-sectional study on 485 confirmed dengue cases in Vitória, Brazil
- Journal/ Impact Factor BMC Infectious Diseases, 2016/ IF: 2.77
- 9 Authors Vicente CR, Cerutti Junior C, **Fröschl G**, Romano CM, Cabidelle AS, Herbinger KH
- Title Influence of demographics on clinical outcome of dengue: a cross-sectional study of 6703 confirmed cases in Vitória, Espírito Santo State, Brazil
- Journal/ Impact Factor Epidemiology and Infection, 2017/ IF: 2.04

- 10 Authors Berens-Riha N, Kroidl I, Schunk M, Alberer M, Beissner M, Pritsch M, Kroidl A, **Fröschl G**, Hanus I, Bretzel G, von Sonnenburg F, Nothdurft HD, Löscher T, Herbinger KH
- Title Evidence for significant influence of host immunity on changes in differential blood count during malaria
- Journal/ Impact Factor Malaria Journal, 2014/ IF: 3.11
- 11 Authors Tanaka LF, Latorre MR, Gutierrez EB, Curado MP, **Froeschl G**, Heumann C, Herbinger KH
- Title Risk for cancer among people living with AIDS, 1997-2012: the São Paulo AIDS-cancer linkage study
- Journal/ Impact Factor European Journal of Cancer Prevention, 2017/ IF: 2.89
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- 13 Authors Nji AM, Ali IM, Moyeh MN, Ngongang EO, Ekollo AM, Chedjou JP, Ndikum VN, Evehe MS, **Fröschl G**, Heumann C, Mansmann U, Ogundahunsi O, Mbacham WF
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- Title Sustained use of biogas fuel and blood pressure among women in rural Nepal
- Journal/ Impact Factor Environmental Research, 2015/ IF: 3.09
- 16 Authors Islam SM, Alam DS, Wahiduzzaman M, Niessen LW, **Froeschl G**, Ferrari U, Seissler J, Rouf HM, Lechner A
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- 17 Authors Islam SM, Lechner A, Ferrari U, **Froeschl G**, Alam DS, Holle R, Seissler J, Niessen LW
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- Title                              Social and economic impact of diabetics in Bangladesh: protocol for a case-control study
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- 21 Authors                      Girma E, Tesfaye M, **Froeschl G**, Möller-Leimkühler AM, Müller N, Dehning S
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- 1 Authors **Froeschl G**, Kayembe PK

Title Pox-like lesions and haemorrhagic fever in two concurrent cases in the Central African Republic: case investigation and management in difficult circumstances

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- 2 Authors **Guenter Froeschl**, Kristina Huber, Frank von Sonnenburg, and Silke Woelfel

Title Zika Virus Germany ex Maldives

Journal International Society for Infectious Diseases - Promedmail, 2016
  
- 3 Authors **Froeschl G**, Huber K, von Sonnenburg F, Nothdurft HD, Bretzel G, Hoelscher M, Zoeller L, Trottmann M, Pan-Montojo F, Dobler G, Woelfel S

Title Long-term kinetics of Zika virus RNA and antibodies in body fluids of a vasectomized traveller returning from Martinique: a case report

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D) Übersichtsartikel/Reviews

- 1 Authors Reshman Tabassum, **Guenter Froeschl**, Jonas P. Cruz, Paolo C. Colet, Sukhen Dey and Sheikh Mohammed Shariful Islam

Title Untapped aspects of mass media campaigns for changing health behaviour towards non-communicable diseases in Bangladesh

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E) Buchkapitel/Book Chapters

- 1 **Fröschl G** und Riebel L. Medizin als globales Menschenrecht - Aus der Praxis der internationalen Nothilfe. In: Menschenrechte und Medizin - Grundfragen der Medizinischen Ethik. Verlag Barbara Budrich. 2016

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- 1 Abubakar I, Plasencia A, Bärnighausen T, **Froeschl G**, Burton M, Cobelens F. Horizon Europe: towards a European agenda for global health research and innovation. The Lancet, 2019
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