# Are Dutch physicians in global health and tropical medicine adequately trained for their work in a low resource setting: a qualitative study

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# I. ABSTRACT


## Background

Dutch physicians in global health and tropical medicine (PGHTM) are educated to work adequately in a low-resource setting. There are multiple institutions that train doctors for working in global health and tropical medicine. One of them is the 'Training Institute for Global Health and Tropical Medicine' (OIGT) in the Netherlands. In 2014, the OIGT started with a new two and a half year training program including a global health residency where PGHTMs go to a low-resource setting for six months to bring into practice what they have learned in the Netherlands. In 2025 the residency program is scheduled to be revised. For this next revision, the OIGT wishes to thoroughly examine to what extent PGHTMs are adequately trained for their work in a low-resource setting on a global level. Such a revision has not been done before. This explorative qualitative study is part one of a research project that will support revision of the training program.

## Objective

The aim of this study was to gather a wide perspective of PGHTMs' experiences and opinions on the training program and their work in a low-resource setting.

## Methods

In this explorative qualitative study, 23 PGHTMs graduated since 2016 were interviewed. The interviews were semi-structured and used a topic lists with relevant themes such as: the work field of PGHTMs, the training program and the discrepancies between the two. The interviews were then transcribed and coded (open, axial, and selective) using Atlas ti. Interviews were held until theoretical saturation was reached.

## Results

Through data analysis, experiences, and opinions of PGHTMs could be divided into five identified core categories: (1) the training program, (2) the work of PGHTMs, (3) 'the' PGHTM, (4) challenges PGHTMs face, and (5) current dilemmas.

## Conclusion

The findings of this study suggest that the OIGT is succeeding in adequately training PGHTMs for their work in a low-resource setting at a global level. The addition of the global health residency plays an important part in this. However, there are a few discrepancies between what competencies are taught in the program and what is required in the field. Further research is needed to explore to what extent these competencies should be revised in the training program. The OIGT could use present findings to make needed adjustments to the program.



## Keywords

Global health, Tropical medicine, Training program, Physicians, Semi-structured interviews, Qualitative study

## II. LIST OF ABBREVIATIONS

In this rapport many abbreviations are used. To make their meaning easily accessible, a list of abbreviations and their meaning is provided below.

| **Abbreviation** | **Meaning** |
|---|---|
| AIGT | Arts Internationale Gezondheidszorg en Tropengeneeskunde, PGHTM in Dutch |
| CanMEDs | Canadian Medical Education Directives for Specialist |
| CIGT | Concilium Education Tropical Medicine |
| CGS | Committee Medical Specialties |
| COREQ | Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups |
| EPAs | Entrusted Professional Activities |
| ER | Emergency room |
| EQUATOR-network | Enhancing the QUAlity and Transparency Of health Research |
| GHTM | Global health and tropical medicine |
| GGD | Dutch municipal health service |
| HIC | High-income country |
| HIV/AIDs | Human immunodeficiency virus infection/acquired immunodeficiency syndrome |
| IT | Isabelle Tiggelaar, head researcher of this study (female) |
| IUDs | Intrauterine devices |
| KIT | Royal Tropical Institute |
| LMIC | Low- and middle-income country |
| MD | Medical Doctor |
| MKP | Mother-child profile (MKP) |
| MSF | Doctors without Borders |
| NCDs | Non-communicable diseases |
| NGO | Non-governmental organization |
| NTC | 3-Month course in Global Health and Tropical Medicine |
| NVTG | The Netherlands Society for Tropical Medicine and International Health. |
| OBGYN | Obstetrics and Gynecology |
| OIGT | Training Institute for Global Health and Tropical Medicine |
| OLVG | Hospital in Amsterdam |
| PGHTM | Physicians in global health and tropical medicine, sometimes referred to as ‘tropical doctor’ |
| RDMA | Royal Dutch Medical Association |
| REC | Research ethics committee |
| SDGs | Sustainable development goals |
| UN | United Nations |
| Tropical Doctor | See PGHTM |
| VUmc | Vrije Universiteit medical center |
| WMO | Medical research law |

# III. TABLE OF CONTENTS

# 1 Introduction

To better understand the value and necessity of this research, this introduction will discuss the history of global health and tropical medicine (GHTM), the value of physicians in global health and tropical medicine (PGHTMs), different training programs, Dutch PGHTM's profile, current developments, and the planned evaluation of the Dutch training program. Two important definitions are those of tropical medicine and global health. Tropical medicine is "the practice of medicine in the tropics between the tropic of Cancer and Capricorn." It entails both communicable and non-communicable diseases (NCDs) (1). The current definition of global health defined by Koplan et al. describes global health as "an area for study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide"(2). One setting where tropical medicine and global health play a prominent role is that of the low-resource setting. According to a recent qualitative study, nine themes relate to the term low-resource setting: financial pressure, suboptimal healthcare service delivery, underdeveloped infrastructure, paucity of knowledge, research challenges and considerations, restricted social resources, geographical and environmental factors, human resource limitations, and the influence of beliefs and practices (3). In this study these settings are described as disadvantaged areas.

*History of tropical medicine and global health*

Education in tropical medicine has been around for more than a hundred years. One of the founding fathers of tropical medicine was sir Patrick Manson (1). In the late 19$^{th}$ century sir Patrick Manson founded the London Institute for Hygiene and Tropical Medicine. The institute gathered research on tropical diseases and educated Medical Doctors (MDs) before they would serve in the colonies. The United Kingdom was not alone in the belief that MDs required more knowledge before they went overseas. For example, in 1906 the Prince Leopold Institute for Tropical Medicine in Antwerp, Belgium was founded and in 1907 the Netherlands followed with the establishment of the Netherlands Society for Tropical Medicine and International Health. (in Dutch: Nederlandse Vereniging voor Tropische Geneeskunde en Internationale Gezondheidszorg (NVTG))

All these programs focused on educating MDs who are heading to the south in the specific tropical diseases found there, combining this with research on tropical diseases. For example, it was the aforementioned Manson who proposed the mosquito-malaria theory in the late 1890s (1,4). The European tropical institutions founded in the early 20$^{th}$ century still educate MDs today in tropical medicine and global health.

Since its foundation one century ago, the field of tropical medicine has changed quite a bit. First of all, the medical aspect of tropical medicine now does not only focus on infectious diseases (communicable diseases), but has expanded to emergency care, travel medicine and non-communicable diseases (5). Secondly, the motivation for working in LMICs and especially in a low-resource setting has changed. A hundred years ago people would serve their country to work in the colonies or were interested in discovering new diseases and aimed for adventure. Nowadays, the work of MDs in a low-resource setting also involves global health, where MDs strive to achieve health equity worldwide (2). These changes in the practice of tropical medicine ask for an adaptation of the education programs to train physicians, not only in tropical medicine, but also in global health. These MDs are called physicians in global health and tropical medicine (PGHTMs). Interest in global health has

increases amongst medical students at a global level, for example with 270% between 1998 and presently in the US and Canada alone (6).

*Value of physicians in global health and tropical medicine in High Income Countries (HICs)*
Recently urgent calls have been made to incorporate global health education into the mandatory curriculum for all medical students in multiple HICs including the United Kingdom and the Netherlands (7,8). One of the reasons is that global health and tropical medicine is not something that just happens outside of Western countries, but due to our globalizing world it is also of added value in domestic health care (9).
For example, tropical diseases like tuberculosis, malaria, and human immunodeficiency virus infection and acquired immunodeficiency syndrome (HIV/AIDS are also prevalent in the Netherlands (10,11). In addition, research shows that global health electives help MDs to work more as a generalist resulting in better patient care (9). Not only HICs show a growing interest in global health, in many LMICs global health education centers and institutions are started, including South Africa, Rwanda and Mexico (12).

*Value of physicians in global health and tropical medicine in LMICs*
Besides the beneficial effects on local health care systems in HICs, PGHTMs could have a global impact. This because PGHTMs strive for better health care worldwide, they help with reaching the sustainable development goals (SDGs) of the United Nations (UN).
In 2015 the UN announced the SDGs, the successor of the Millennial Development Goals (13). They consist of seventeen new goals, agreed upon by the general assembly of the UN, to make our world more sustainable and a better place to live. Interestingly, many of the SDGs are associated with health care, and especially global health care. With the work that PGHTMs do they work towards obviously goal number three: Good Health and Well-Being. But also goals number one (no poverty), two (zero hunger), and ten (reduced inequalities) (13). According to Our World in Data, statistics show that hunger and poverty are more present in Sub-Saharan Africa than in any other part of the world (figure 1 and 2) (14,15). These factors, combined with the fact that this area of the world also has the least medical professionals per 100.000 people (16), adds to the great differences in wealth and well-being across the world. A recent study shows these professionals include MDs that migrate from lower income countries to work in higher income countries, adding to the inequality of health needs and health care provision worldwide (17). This phenomenon is known as 'brain drain' (18).

*Different training programs*
Most (post) graduate and specialization programs around the globe nowadays incorporate a module or elective on Global Health in their curriculum. For instance, an MD specializing in family medicine in HICs would have the opportunity to go to a LMIC and gain experience in global health and tropical diseases that could occur in their home country as well (19,20).

Worldwide there are a few institutes that educate MDs specifically for working in tropical medicine and global health. These include programs of the London school for Hygiene and Tropical Medicine in the UK, the Tropical Institute Antwerp in Belgium**,** Tulane University in the US, and the Training Institute for Global Health and Tropical Medicine (OIGT) in the Netherlands. All take a different approach compared to the global health electives. For example, The London Institute for Hygiene and Tropical Medicine offers a three-month

course in tropical medicine and public health. It teaches students to “understand, diagnose, treat and prevent diseases that are especially prevalent in tropical and developing countries where resources may be limited.”(21) The Prince Leopold Institute for Tropical Medicine teaches a post-graduate course in tropical medicine and international health. This course consists of two modules: introduction to international health and tropical medicine and clinical decision-making. “It combines clinical, epidemiological and biomedical knowledge and skills with a systematic approach to health care organization and disease control.”(22) The School of Public Health and Tropical Medicine of Tulane University has a master program in public health and tropical medicine. This program focuses on tropical infectious diseases, and “prepares public health practitioners to plan and evaluate disease control and prevention programs, physicians to better treat and evaluate tropical diseases, or students to pursue medical school and other medical professions.” (23) A similarity between the institute in London, Antwerp and Tulane is the focus on the education of MDs and research in tropical diseases. This format is also seen in the courses for Tropical Medicine at universities and institutes in other parts of the world (24). The OIGT education program in the Netherlands, on the other hand, choses a different focus. The OIGT post-graduate training in Global Health and Tropical Medicine (GHTM) prepares doctors to work in low-resource settings at the crossroads of clinical care and public health (25). When MDs have finished the program, they are called Physicians in Global Health and Tropical Medicine (PGHTMs) or, in Dutch: *Arts Internationale Gezondheidszorg en Tropengeneeskunde (AIGT).*

*Physicians in Global Health and Tropical Medicine profile*

A PGHTM is a generalist who is trained in different medical specialties (emergency care, pediatrics, obstetrics and gynecology (OBGYN), general surgery, primary care), knows how to run a hospital, work together with local governments, and educate local medical professionals. In addition, they are taught how to work well in teams and are encouraged to do research and report on their work to the world, which makes them advocates for global health, human well-being, and equality (26).

In general, they work for several years in low-resource settings with a focus on marginalized communities (27,28). After this period, they often return to the Netherlands where they either continue their education in a medical specialty or primary health care or start working for various organizations (28).

*Recent developments*

The Dutch OIGT started many years ago with training physicians before working in a low-resource setting, and only recently started a program for an official MD profile degree in GHTM.

The current training program in runs since 2014 (29). To ensure the sustainability of the program and its added value to society, the Concilium Education Tropical Medicine (CIGT in Dutch) of the Dutch Association for Tropical Medicine and International Health Care (NVTG in Dutch) monitors the quality of the training program and gives advice to the OIGT. In figure 3 more insight into the structures and relations between all organizations involved is given (30).

Over the past ten years, the NVTG and OIGT have taken steps to continue improving the education program for PGHTMs.

First, the training program has been recognized by the Committee Medical Specialties (CGS) of the Royal Dutch Medical Association (RDMA) as a physician's profile (29). Second, the Dutch ministry of Health, Welfare and Sport has allocated a small fund for the training institute (31,32). Additionally, in 2014 the OIGT incorporated a six-month residency in a low-resource setting in the program. Finally, every five years the curriculum is reviewed and revised. The most current program was established in 2020. It is based on the seven competencies described in the Canadian Medical Education Directives for Specialist (CanMEDs) (33).

The in 2020 accredited training program consists of two 1-year clinical residencies in the Netherlands, surgery or pediatrics and OBGYN, 10 additional 1-day trainings in overarching topics, and the 3-month course in Global Health and Tropical Medicine (NTC in Dutch) at the Royal Tropical Institute (KIT). This part of the program takes more than two years to complete. Finally, the global health residency, in which residents follow a 6-month training in a low-resource setting, completes the program (25). In 2020 the curriculum of the program was revised to fit a modern educational model. In this new model Entrusted Professional Activities (EPAs) were formulated based on the CanMEDS competencies. The PGHTMs are tested in these competencies and assigned the related EPAs.
A total of seven competencies are described in the new curriculum: Medical Expert, Communicator, Collaborator, Leader, Health Advocate, Scholar, Professional (33).

The Global Health and Tropical Medicine program has 18 EPAs derived from these seven competencies. These EPAs as well as the program's schedule can be found in the curriculum outline of the OIGT 2020 (26).

*The CIGT evaluation*
For the upcoming revision of the GHTM training program for 2025, the CIGT would like to thoroughly examine the contents of the training program.
This means not only evaluating how well the competencies are taught, but also examining how the competencies match with the ones needed in the field. Not only because the work field is dynamic and has certainly changed over the past seven years, but also because PGHTMs might experience shortcomings in their competencies confronted with the needs in the field. To prevent this in the future, the program is intended to be adjusted based on the results of the research project of the CIGT.

The review project consists of three studies/phases:

1. A qualitative study to explore to what extend PGHTMs are adequately trained for working in a low-resource setting. (Isabelle Tiggelaar – scientific research clerkship (IT))
2. A quantitative study of PGHTMs to measure how adequately trained they are for working in a low resource setting.
3. A qualitative study to explore how host institutions experience working with PGHTMs.

By bringing together the results (triangulation) from part one to three the CIGT hopes to clarify the strengths and weaknesses of the current education program and discover /assess the learning needs of PGHTMs.

This study is part one of the CIGT research project.

## 1.2 PROBLEM STATEMENT

It is unclear to what extent PGHTM are adequately trained for working in a low-resource setting. To explore this, the following research question and sub-questions were formulated.

*Research question:*
What is needed to train Physicians of Global Health and Tropical Medicine (PGHTMs) adequately for their work at a global level with a focus on disadvantaged communities?

*Sub-questions:*

- What are the competencies acquired during the training program by a PGHTM?
- What does the work field of a PGHTM consists of?
- What competencies are required for a PGHTM?
- What are discrepancies between the competencies taught in the program and those needed in the field?
- What competencies are necessary in the program for the next generation PGHTMs?

*Research purpose*
The purpose of this study is to explore the professional views PGHTMs hold on the education program of the OIGT, which they followed, and to use this information to review the current program. An explorative qualitative study has been chosen to explore the needs of the PGHTM after following the AIGT program and working in the field.

The results will be used by the CIGT to provide advice to the OIGT, and the NVTG, for the 2025 revision of the AIGT training program.

# 2 METHODOLOGY

A qualitative study was done to explore the experiences and opinions of Dutch PGHTM as to whether they are adequately trained for their work in a low resource setting. This study is part of a research clerkship. To ensure the scientific value of this study, a research group assisted with the research. This group consisted of members from the CIGT and Vrije Universiteit medical center (VUmc). In addition, the 'Consolidated criteria for reporting qualitative research' (COREQ) checklist for qualitative research provided by the 'Enhancing the QUAlity and Transparency Of health Research' (EQUATOR) network was applied (34). The checklist for this study can be found in appendix A.

## 2.1 Design

This study focused on the professional experiences and opinions of the training PGHTMs received and the work they have been doing in the field. The study design was based on qualitative analysis approach described by Hennie Boeije (35). The data was collected through semi-structured interviews. The topic guide for the interviews was developed following framework analysis (36). The framework was based on themes emerging from the current education program of the OIGT, conversations with field experts and a literature search on education programs in global health and tropical medicine. This search was executed using the library of the OLVG. The search strategy can be found in Appendix B. The selected literature was also used as background for the introduction and discussion.
Data was collected and then sorted through open, axial, and selective coding. A comparative approach was chosen in this explorative setting to get as broad an answer as possible. Through this process several main themes arose that helped answer the sub-questions and consequently the research question.

## 2.2 Study population

Purposive sampling was used to obtain a broad perspective. Respondents were contacted until theoretical saturation was reached. The study population was chosen to be as diverse and representative as possible, taking into account the following characteristics:

- Male/Female
- Graduation year from 2014 onwards (from this year the program included the global health residency)
- Where PGHTMs work(ed) in a low-resource setting
    - Location of work:
        - Country
    - Type of work:
        - Primary/secondary/tertiary hospital
        - Humanitarian/developmental
- Work after GHTM
    - General Physician
    - Gynecology/Obstetrics (OBGYN)
    - Surgery
    - Internal Medicine
    - Public Health
    - Research
    - Management

- Other

The OIGT supported the research, by providing the contacts of possible respondents.

In total the study population consisted of 72 people and 38 were contacted through email. Of the contacted PGHTMs, some did not respond and others declined to partake in this study. Respondents were contacted until the interviews provided no substantial new information for this study. Theoretical saturation was reached at 23.

In total 23 respondents were selected. These 23 PGHTMs were a good representation of the study population, as can be seen in table 1. All 23 respondents read, understood and signed the informed-consent letter. This letter can be found in Appendix C.

| Variable | Study Population (%) | Respondents (%) |
|---|---|---|
| **Female** | 58 (81) | 18 (78) |
| **Male** | 14 (19) | 5 (22) |
| | | |
| **Classical profile** | 62 (86) | 19 (83) |
| **Mother-Child profile** | 10 (14) | 4 (17) |
| | | |
| **Region: Sub Sahara Africa** | 36 (50) | 19 (83) |
| **Region: others** | 20 (28) | 4 (17) |
| **Region: unknown** | 16 (22) | 0 (0) |
| | | |
| **Graduation year** | | |
| **2017** | 12 (17) | 3 (13) |
| **2018** | 19 (26) | 6 (26) |
| **2019** | 22 (31) | 8 (35) |
| **2020** | 14 (19) | 5 (22) |
| **2021** | 5 (7) | 1 (4) |

*Table 1: study population versus respondents based on the information provided by the OIGT*

The difference between the study population and respondents in regard to the work region can be explained that for many of the study population their work region was not known yet. For the respondents all work regions were recorded.
Most respondents graduated the program within three years. Respondents that took longer often wanted to stay longer with a residency part of the program or had private reasons.

Since the study population and the work field consist of a small number of people that often know each other, no information specific to respondents is given, to ensure their privacy. Some of the respondents were back in the Netherlands after their time working as a PGHTM abroad. Some were working as specialists in training (varied specialties, many in gynecology). Others were in training to become a primary health care physician or were working for the Dutch municipal health service called GGD.

## 2.3 Data collection methods

Semi-structured interviews were conducted by the head researcher (IT) until theoretical saturation was reached (no new information was obtained). In total 23 interviews took place with an average duration of 45-55 minutes.

Based on the literature study the following themes were added to the topic list: education, finance, mentoring and nutrition.
To ensure the validity of the interview questions based on these themes, a pilot interview was held. Based on this pilot interview the first question was changed from: What have you learned in the training program for PGHTM? To: When you first started working as a PGHTM, you had acquired all sorts of skills and competencies, could you describe what these skills and competencies were?
The themes and semi-structured questionnaire can be found in Appendix D.
Main topics addressed in the semi-structured interviews were:

- Information about competencies they acquired in the OIGT program.
- Information about what their work in the field consists of.
- Opinions and experiences about what competencies are required by a PGHTM.
- Observations on how the field is changing.
- Opinion on what changes in the OIGT training program are required.

During each interview, notes were made of themes that arose during the conversation. In the following interviews these notes were used to address topics that might have been underexposed. In addition, topics that were described in detail during interviews were addressed more shortly as control in the following interviews. These topics included the epidemiology of NCDs, working with finances, and knowing how to use the ultrasound. In later interviews these topics came up as well, though the interviewer did not ask in detail the background of these examples. With the last few interviews very few to no new information was collected, indicating that theoretical saturation as described by Hennie Boeije had been reached (35).

## 2.4 Data analysis

The data analysis was performed using the research questions as framework. The interviews were recorded with a Dictaphone app on the computer and transcribed at verbatim. For transcription two software programs were used: f4transkript (37) and Trint (38). Trint is an online program using artificial intelligence to transcribe audio files. These transcript were then checked manually (IT).
All respondents were sent their transcripts and given the opportunity to make adjustments.

The data was analyzed, partly using Atlas ti., partly by manual coding. The data was coded through open, axial, and selective coding. In open coding the transcripts are read and segmented into quotes. These quotes are then labelled. These labels are called codes. During this process certain patterns emerge, and different categories of codes can be identified. This process is called axial coding. From these categories, one or more core categories are chosen. These categories best represent the overall findings of the study. This process is called selective coding (35).
For open and axial coding Atlas ti. was used. In total 1051 quotations were made. These were divided subsequently into 205 codes and 7 code groups. To get a clearer few of the

relationship between codes a manual phase of coding followed in which an analog mind map with all 185 codes was made. A scan of this map is added as appendix E.
Through these phases core concepts were found and a final theory was created as shown in the results section of this research rapport. To create a clear overview of the core concepts, code networks, also known as code trees, were created in Atlas ti. The networks can be found in appendix F. The results section of this research rapport was structured based on these networks.

## 2.5 Data storage

The data that was collected consists of interviews, memo's, literature, and field notes. The data was stored on a separate secure hard drive in possession of the head researcher. All privacy sensitive documents were password protected. For the online software Trint, the security measures taken were discussed with the research group and were found adequate (39). After the transcripts were checked, the audio files of the interviews were deleted, including those stored online.

## 2.6 Informed consent, ethics and confidentiality

Semi-structured interviews can sometime address sensitive topics, which can cause respondents to refuse participation or to withhold information. That is why the following step-plan was chosen:

- To make sure respondents were aware of their rights. An informed-consent letter was sent. These rights include the possibility to leave the study at any moment, assurance of anonymity, and confidentially from all researchers (from the research group) involved. All 23 respondents signed this letter verbally.
- To take into consideration all COVID-19 measures, all interviews were held online through Zoom.
- All interviews were stored in a secure online environment. Only the researchers involved in this study were able to study the raw data. This included the head researcher (IT) and one other researcher for inter-rater-reliability.
- In the research report itself, no respondents are named, to ensure anonymity codes were used.

This research topic does not fall under medical research law (in Dutch WMO) -obligatory research. Therefore, no approval of the research ethics committee (REC) was required. To ensure no ethical issues were overlooked, an ethical waiver was requested from the KIT REC, as was received in March 2020. The clearance letter can be found in appendix G.

# 3 RESULTS

The structure of this results chapter is based on the framework of this study and the core categories found during analysis. These core categories are made visual in code networks (Appendix F). The following themes will be discussed: the training program, the work of PGHTM, the different aspects of the PGHTM, the challenges of the work of PGHTMs, and current dilemmas.
The interviews were held in Dutch. Therefore, the quotes provided are translated to English. Only PGHTMs are quoted. If a part of a quotation is in brackets [..], a remark has been made by the head writer (IT) to clarify the meaning of the quotation.

## 3.1 The training program

In the interviews, PGHTMs spoke about their experiences and opinions on the training program of the OIGT. Varied topics were discussed, ranging from comments on the curriculum, supervision, and structure.

### 3.1.1 Curriculum

The components of the curriculum differ between PGHTMs because there are two training profiles. For PGHTMs that followed the classical profile, this meant surgery, and obstetrics and gynecology (OBGYN). For PGHTMs that followed the mother-child profile, this was pediatrics and OBGYN. All PGHTMs had followed additional education days, the NTC, and the global health residency, which were also discussed during the interviews. In the end, some experiences and opinions are shared that are not related to a specific part of the curriculum, but more general opinions.

#### *Surgery*

For surgery, most PGHTMs thought they had learned the necessary procedure techniques and were adequately trained for working independently in a low-resource setting. Many PGHTMs stated that the theory and techniques they had learned in the Netherlands were further developed during the global health residency. Most PGHTMs were confident about the assessment of an acute abdomen, operating a hernia, basic wound care, and emergency care. During their residency they spent time in the ER. Here they learnt to prioritize patients and how to keep their head clear in stressful situations. PGHTMs were more enthusiastic about their surgical residency if the supervisor considered their learning goals and would include them in surgical cases useful for PGHTMs. One PGHTM put it this way:

> *"My supervisor had also worked in Tanzania for 5 years as a tropical doctor. So he really said: look, later when you go to the tropics you will get this and you can do it like that. And I think that there, the supervision was good, there was room for us to do procedures independently. So for example, I did quite a lot of inguinal hernias there." –R05*

When PGHTMs were not happy with their surgical residency, this often had to do with the amount and type of surgical exposure they got, the supervision they received, and how much independence they were trusted with. One PGHTM, that had previous experience working in a surgical department said:

> *"I have seriously spent days in the emergency room without doing anything. My night shifts were just sleeping. I didn't do anything and also in*

*terms of ORs. There was just priority, well not priority, but the doctors not in training were also placed on ORs and I just thought that was weird. As a result, we as tropical doctors, the four of us were there in the tiny hospital, we simply had no time or simply less time to go to the OR. Yes, and with all these things, I ended up learning most of my 'not in training' spot. […] It's a bad thing to say, but I really have nothing. Nothing I can really think of that I thought yes, I really took that with me from my tropical training." – R20*

Some PGHTMs said they would have liked the opportunity to have more practical training in surgical techniques that are not frequently used in the Netherlands but are used in low-resource settings, for example creating a hand-laid seam of the intestines.
In the Netherlands, many surgeries are performed laparoscopically. However, in low-resource settings, this is often not an option. During the surgical residency, this proved to be a challenge for PGHTMs.

*"Of course we don't have to learn laparoscopic skills, well we had a lot of laparoscopies in [host hospital in the Netherlands], so I also did laparoscopic appendectomies which is still good for your anatomy knowledge and I mean, I always think, if you can remove it laparoscopically you can also remove it open. That's what the trainer said." – R18*

Some PGHTMs wondered to what extent it is possible to acquire surgical skills in a residency of only one year. In addition, one PGHTM stated he or she would have preferred learning more about internal medicine since this would give a better understanding of the way the body and diseases work.

### *OBGYN*

For OBGYN, almost all PGHTMs were confident that they were adequately trained for their work by their host hospitals in the Netherlands. During their residency, they had learned how to supervise normal pregnancies, and deliveries, to treat sick pregnant women, to do vacuum deliveries, obstetric ultrasounds, how and when to do c-sections, and curettage. Complicated twin pregnancies, or pregnant women with (pre) eclampsia, were considered more challenging. Most PGHTMs were not confident in performing a hysterectomy since they did not have enough exposure. However, PGHTMs had learned this (and other procedures) either during their global health residency or had learned this from more experienced colleagues in the field.
PGHTMs were especially content with their OBGYN residency if they were allowed to follow extra training, for example, the breech course. Or, again, if the supervisor would invest in their learning process by involving them in OBGYN-cases interesting to them and give additional information applicable for low-resource settings. Moreover, some supervisors would exempt them from cases that PGHTMs thought would not be useful, for example cervical swabs, inserting intrauterine devices (IUDs), or how to do a transvaginal ultrasound. In cases where PGHTMs were not happy with their residency, they were often not happy with the amount of exposure they had received or the supervision they were given.

### *Pediatrics*

Four of the respondents had followed the mother-child profile. With these PGHTMs the pediatrics residency was discussed. Overall, PGHTMs were very content with this residency.

Especially when the supervisor and other pediatricians (preferably with experience in a low-resource setting) invested in their learning process by taking the time to teach them the difference between normal and abnormal findings in children and explaining the pathology. PGHTMs gained experience through spending many hours in the hospital, therefore increasing their exposure. They saw the pediatric residency as a learning-friendly environment. At the end of the residency, the PGHTM was comfortable in taking care of children, especially neonates. One challenge some PGHTMs mentioned was that the medical cases were more severe in a low-resource setting than their host hospital in the Netherlands. It was also seen as a challenge when the PGHTM was the only PGHTM in training at the hospital. In this case, there was less focus on connecting the Dutch setting to the work setting for PGHTMs.

### *Additional education days*

There were ten additional education days throughout the two residency years in the Netherlands. They covered a wide variety of topics ranging from surgical techniques to the use of antibiotics. Some PGHTMs thought the education days add a wider perspective to the training program and connect the Dutch setting with that of the work field. Some of the days were mentioned as useful, for example, the tooth extraction and the external fixture for fracture. Other days were not mentioned during the interviews. One PGHTM mentioned that the education day had great value to build up relationships with fellow PHGTMs in training. Another PGHTM noted that they would have preferred to have more in-depth courses. For example, with the tooth extraction, to also cover the jaw abscess, since this complication is often seen in a LMIC. Some PGHTMs did mention that the education days would be a great opportunity to teach PGHTMs more on certain topics (for example how to use the ultrasound) and should stay a part of the curriculum.

### *NTC*

Every PGHTM was excited about the NTC and said they had enjoyed it tremendously. PGHTMs often remembered specific classes when asked how the training program had prepared them for certain aspects of the work field. These are the classes they named: human resource management, conflict management, how to lead, crowd management, ordering and re-stocking medication, lab techniques, infectious diseases (HIV, malaria, tuberculosis, parasites, etc.), NCDs, keeping budgets and finances, how to best transfer knowledge, how to start a course, how to give presentations, how to start sustainable projects, intercultural communication and cultural sensitivity, community health, public health, the health allocation game, and how to manage your private life and prevent burn-outs. Most PGHTMs said that the NTC conveyed a lot of information in a very short time. They also said they had kept notes that they still frequently consulted. Especially on topics that become more relevant later when they are in jobs with more responsibility, for example, medical superintendent.

PGHTMs said the NTC taught them how to look at health care from a different perspective. An angle that looks at the patient more holistically and at health care more at a macro level. The NTC also taught them how to be culturally sensitive and be prepared for the challenges that come with working in a low-resource setting or/and in a LMIC.

Some PGHTM did note that they would have liked to learn more about the role of primary health care in a low-resource setting. Another thing that one PGHTM missed was the communication with local colleagues. Although intercultural communication was taught, this

was mainly focused interacting with patients and governments, not on dealing with colleagues. Lastly, some PGHTM thought it was a shame that the content of the NTC was only covered during the NTC and that it was not integrated into the whole training program. Especially since the NTC takes place at the very end of the curriculum, right before a PGHTM goes abroad.

### *Global health residency*

According to the PGHTMs, the global health residency was one of the best parts of the training program. During their six months abroad, they took the basic skills they had learned in the Netherlands and consolidated these during the global health residency. They said this was because of the large surgical exposure there, especially in performing c-sections. The working hours were intense with a steep learning curve (12-14 hours per day and sometimes multiple 24hours shifts per week).

> *"I was actually able to do 40 caesarean sections in [host hospital in the Netherlands] and more than 200 in India in those six months. That is quite a difference." – R15*

The PGHTMs that started training in 2014 were the first that went on the global health residency. These PGHTMs described some start-up problems they experienced. For example, some host institutions did not create a good learning environment for a PGHTM in training. One PGHTM in training did not understand why they could not just start working as a PGHTM, instead of one in training. Another wondered if future PGHTMs in training would be independent enough when they graduated, since they received supervision for such a long time.

Some PGHTMs said the global health residency was a chance to work in a low-resource setting for the first time without being fully responsible and still having some supervision from both their host institution as well as someone from the Netherlands. A safe setting comparable to the work field, where they could learn from their first mistakes and learn about cultural sensitivity, working in a low-resource setting, and what their limitations as doctors are. Many PGHTMs from the classical profile also mentioned they gathered almost all their pediatrics knowledge during their global health residency. In addition, PGHTMs noted that a lot of theoretical knowledge was put into practice during this time. For example, how to treat tropical infectious diseases (malaria, tuberculosis, HIV), how to work with colleagues from a different culture, and how to handle situations where you are the guest and don't agree with your local supervisor. Most PGHTMs said that at the end of the six months they felt capable to start working as a PGHTM.

> *"I really liked the fact that the internship abroad [global health residency] was also included. When you leave the Netherlands, they often work with those competencies from 1 to 5 how competent you are. Usually with most, you are then around 4 and during your internship abroad I noticed that I really just went towards 5 and that I also dared to carry out procedures independently." – R19*

### *In General*

Generally, PGHTMs said they received a good foundation for practicing global health and tropical medicine in the training program. Some PGHTMs said this was because of the high-quality health care standard they were taught. This way they would know what looked like

the best possible care possible and could try to provide this for their patients later on. Additional to the clinical quality, PGHTM stated the program had taught them how to look at the health care system from a broader perspective.

Moreover, when asked in what way the program had specifically trained them how to teach, multiple PGHTMs could not clearly remember the part of the training program that focused on this. However, they did learn some things about teaching through the structure of the program and their medical education. Some PGHTMs added to this that they would have liked to have had a course on teaching. They called this a teach-the-teacher course.

> *"Look, I mean, In the training we also had to present occasionally and you had to do a CAT [Critical appraisal of a topic] in both surgery and gynecology, you had to have given a number of presentations. Also at the end of your year, so yes, that way they will of course ensure that you stay busy with teaching, explaining. That is what you take with you." – R02*

Lastly, many PGHTMs said the training program taught them to observe patients at a macro level, instead of only looking at the clinical picture presented.

> *"What it has brought me, and in particular that NTC, is really a broader view and a broader understanding of a situation to not only see the medical side of things. But also a broader view." – R09*

### 3.1.2 Supervision

Regarding supervision of the PGHTMs, three parties can be identified: supervision from the host hospitals in the Netherlands, supervision from the host institutions during the global health residencies, and supervision from the OIGT.

#### *Host hospitals in the Netherlands*

The supervision from the host hospitals in the Netherlands showed great variation. Some PGHTMs were excited about their host hospital supervisor, whilst others considered the supervision not of added value to their learning experience. A third group felt that lack of supervision had a bad influence on their learning experience.
Because all PGHTMs had several specialties during the training program (either surgery and OBGYN, or pediatrics and OBGYN) they could compare two experiences of supervision. Sometimes both residencies were in the same hospital, and in other cases PGHTMs in training would switch hospitals when they changed specialties. In general, some PGHTMs would have liked more structure in the supervision and/or more supervision. However, other PGHTMs preferred the 'do-it yourself'-attitude since this would more resemble the situation in the work field. The variation in supervision was not dependent on the specialty. Some were excited about their supervisor during their year in surgery, others not. Some were disappointed in their supervision during their year in gynecology and obstetrics, others enthusiastic. Pediatrics was an exception. Only four respondents had followed the mother-child profile, none of them were unhappy with their supervision during their pediatrics residency.
In the cases where PGHTMs were excited about their supervisor, he or she would invest in the learning process of the PGHTM, for example by actively inviting them to cooperate in surgical cases that were of value to the PGHTMs (hernia, opening, and closing, c-sections). In

some cases these supervisors would pay extra attention to the low resource setting the PGHTMs would be working in in the future. Most of these supervisors had work experience in low-resource settings themselves. However, experience in a low-resource setting was not essential to being a good supervisor. PGHTMs also mentioned supervisors that had not been in a low-resource setting but were very engaged with the program, and therefore tried to create a learning friendly environment for PGHTMs in training.

> *"So I had relatively often that I was allowed to go to [the] OR. I had a former tropical doctor, say a former surgeon there where I did my training. And he always said, okay, you have to think in advance whether you would operate on this patient before making the CT. And then you have to write it down and then you see afterwards if you were right with the CT. What would you do in the tropics right now? He always asked. So that did help me a lot." – R13*

PGHTMs were disappointed in their supervision at host hospitals if the supervisor did not invest in their learning process. In some cases, PGHTMs felt they were used as an extra workforce and not seen as doctors in training. Some PGHTMs mentioned that lack of supervision made it more difficult for them to be able to do surgical procedures.

> *"You've probably heard too that there are hospitals where PGHTMs are hired, because that is nice and easy. Then they have more hands on board. But not so much focus on training, more to be deployed as MDs not in training. [..] I've just been really lucky with the places I've been. That it just worked really well for me and them." – R21*

### *Host institutions during global health residency*

PGHTMs received supervision from their host institutions abroad during their global health residencies. According to PGHTMs, there was less supervision abroad compared to the Dutch setting. Most PGHTMs thought this was a good thing, since it helped them to become more independent in their work. In addition, the supervisors during their global health residency taught them more about how to treat tropical diseases and, for the classical profile, how to treat sick children. Some PGHTMs mentioned they learned a lot from the experienced supervisors regarding how to practice medicine in a low-resource setting. On the other hand, some PGHTMs did mention that they experienced difficulties with the cultural differences between them and their supervisor.
During the global health residency, PGHTMs also have a Dutch supervisor. However, according to some PGHTMs, they did not experience the additional value of this supervisor. One of the PGHTMs thought it could be beneficial if this Dutch supervision would be more structured, to help overcome the cultural challenges the PGHTMs face during their global health residency.

### *The OIGT*

Lastly, the supervision by the OIGT was mentioned by some PGHTMs. According to most PGHTMs, the supervision by the OIGT was adequate. One PGHTM mentioned they would have liked it if the OIGT had assisted a little more in the preparation for going abroad for the first time.

*"Another part I missed, but that is more from OIGT I think, is more guidance when you really go abroad. So more really a ready-made, well not necessarily ready-made, but that there is more of a kind of fixed package of things that you have to arrange, how this all works, what you can expect when you work as an PGHTM abroad for a longer time. Because now everyone is always figuring everything out for themselves. Some part of it is shared. But I always wonder why that has never really been bundled into one thing." – R23*

### 3.1.3 Structure

In general, PGHTMs were content with the length of the residencies and felt they learned enough in the year they spent in one specialty. Some PGHTMs thought it was difficult to reach the program goals in the set time, but these PGHTMs also mentioned that this was not a big problem, since most learning is done when PGHTMs start working in the field.
In Dutch host hospitals some PGHTMs were trained in locations with many PGHTMs in training. In other host hospitals, PGHTMs were seen and treated as general doctors not in training for a physician profile. Some PGHTMs mentioned host hospitals were not as invested in their training, as in the training of the MD in training for that specific specialty (surgery, OBGYN, pediatrics). These PGHTMs mentioned that this could be due to the financials involved with the program. An MD in training for the specific specialty receives a larger fund for their education from the government than the PGHTM in training.
In these cases, it was difficult for PGHTMs to get enough exposure to become adequately trained in surgical procedures. Some PGHTMs mentioned they would prefer to have had more specific learning goals set by the OIGT. For example, not only the EPA for doing a C-section, but also having a mandatory number of C-sections a PGHTM in training has to do during their OBGYN residency. They thought this would help as leverage when they would discuss their training program with their supervisor. For example, what procedures PGHTMs in training should assist on or be exempt from.

### 3.1.4 Summary

To summarize, the curriculum of the program trains PGHTMs adequately in the competencies included. A good and engaged supervisor are in this case a necessity. For surgery, the role of laparoscopic procedures in Dutch health care is challenging for PGHTMs to learn surgical techniques used in a low-resource setting. PGHTMs from the mother-child profile were content with their education but mentioned the difference in severity of sick children between the Dutch and low-resource setting. The additional education days provided a connection between these two settings for the information taught in all the residencies and were useful for building relationships with other PGHTMs. The NTC included a lot of information, PGHTMs saved their notes and accessed them often later during their work. The global health residency was seen as one of the most important parts of the program where PGHTMs were given the possibility to grow in competencies in a comparable setting to the work field.
The adequacy of supervision in the Dutch setting had a great impact on the learning experience of PGHTMs. Unfortunately, many PGHTMs mentioned this highly varied between residencies and locations. Some PGHTMs thought specific learning goals could help overcome this difference. During their global health residency some PGHTMs thought a

Dutch supervisor with experience in a low-resource setting could help them overcome difficulties with cultural differences. In addition, one PGHTM mentioned he or she would have liked guidance from the OIGT with the preparations for going abroad for the first time as this is a bit chaotic now.

## 3.2 Work of PGHTM

The work of a PGHTM is not something that is set in stone, since the role of a PGHTM depends on the setting he or she works in and/or personal interest. However, similarities between different settings were found. The work of a PGHTM can roughly be divided into the following professional activities: medical and non-medical. Besides the professional activities, the content of the clinical work and the colleagues of PGHTMs are discussed.

### 3.2.1 Medical activities

The medical responsibilities of a PGHTM are not bound to one specialty. This is not surprising, since a PGHTM is regarded as a generalist instead of a specialist. The specialties that are common in the work of PGHTMs are surgery, OBGYN, pediatrics, emergency care, primary care, and internal medicine. However, the work is not limited to these specialties, since PGHTMs in the field provide a wide variety of clinical tasks, as they also perform dental work, do ultrasounds, are responsible for or supervise the anesthetics, and treat patients with dermatological or neurological problems, et cetera. The clinical work they encounter is described in more detail later.

### 3.2.2 Non-medical activities

Whether or not a PGHTM's responsibilities are more than just clinical depends on the role and the experience he or she has. For example, when PGHTMs first start working in a low-resource setting they prefer not to be in charge, and value the supervision of a more experienced colleague. However, there are professional responsibilities that all PGHTMs encounter, independent of their specific work setting. These responsibilities include teaching, the transfer of knowledge, and supervision. A reason multiple PGHTMs mentioned, is that the PGHTM often is the highest trained medical professional present.

> *"We simply are the best trained in the hospital. Yes, you just do it. And you have to really like it, but I have always found it very nice to give training. And I have already done that a lot in the Netherlands, lectures, those kind of things. And if that suits you a bit then yes you will get better at it." – R11*

Also mentioned in the interviews was the role of advocacy of the PGHTM, informing the public, societal involvement, and research. The latter including collecting data on procedures and diseases present in the field and sharing this with the academic field.

Next to this, some PGHTMs had an important role in the management of the hospital or the organization. This leads to other activities, including financial management, public health work, pharmacy, starting projects, and general management (e.g. human resources, solving conflicts, et cetera)

> *"How our hospital functions is that we have a hospital manager and a Medical superintendent. Basically, I am simply responsible for medical*

*matters. So all medical staff is under me, the pharmacy is under me and the laboratory is under me, and the OR. And basically, the hospital manager is responsible for finance and logistics, so let's say the drivers, the cleaners, everything not medical. Together with the hospital manager, we are ultimately responsible for the hospital, so we also make the budget for the hospital. Just what we need for a year and I have to decide for myself what kind of meds [medication] to order, what we need. Of course I have to hire my own people, resolve conflicts. So I do everything, so to speak." – R07*

### 3.2.3 Clinical Work

PGHTMs were specifically asked what the clinical aspect of their work looked like. Although this was highly dependable on the setting and location PGHTMs worked, a general overview could be made. The following specialties are present in the clinical work of PGHTMs: surgery, OBGYN, pediatrics, internal medicine (including NCDs), emergency care, radiology, primary care, dental care, and others. A more detailed description of specific diseases and procedures can be found in figure 4.

### 3.2.4 Setting

There is no such thing as 'the typical setting' of a PGHTM. Regarding the geographical location, all respondents worked in LMICs, and mostly in Sub-Saharan Africa. Others worked in the Pacific and Central and South America. However, not all worked in low-resource settings. Some PGHTMs worked for private or university hospitals where there are more resources available in terms of diagnostic equipment, highly trained medical professionals, and medication. These settings also had a different patient population. For instance, in this setting sometimes patients were more treated for NCDs than in other settings.
Some PGHTMs worked in district hospitals in management, others as medical doctors.
A specific setting was working for MSF. There, PGHTMs could work in different capacities. Like, the role of the medical coordinator involves more management activities, including human resources, finances, and pharmacy. When PGHTMs work for MSF, they often do not perform any surgical procedures, since MSF has surgeons employed.
It was noticed that PGHTMs chose to start working somewhere where they can practice what they have learned in training and were still supervised by more experienced colleagues. This way they could continue growing in their competencies and experience help nearby. Some also stayed working with the project where they did their global health residency or moved to similar settings. After gaining more experience in both medical and non-medical capacities, some moved home, others went on to work in a role with more responsibility, for example, medical superintendent or educator.

*"So the job I had at the end, in [location], I really couldn't have done in the beginning, […]. There I really was, together with another tropical doctor, just the only doctor in that hospital. And because of all the jobs I had done before that, I was able to do it that way." – R22*

PGHTMs from the mother-child profile mentioned that they looked for a specific situation where there is a medical professional present who can take care of the surgical department.

PGHTMs from the classical profile confirmed that the mother-child profile is of best use in a setting where more surgically experienced doctors are present.

The country where a PGHTM is situated is an important factor in the type of work PGHTMs do. For example, in some countries, knowledge of nutrition or hygiene matters is scarce. This impacts the types of diseases that are prevalent. This also is linked to the facilities available (diagnostic, and operative) and the possibilities of referring patients. In some cases, referral is not possible, or it takes more than eight hours to reach the nearest facility, meaning that the PGHTM is the best medical professional present in acute situations.

### 3.2.5 Colleagues

The colleagues of PGHTMs consist of local professionals and fellow ex-pats. PGHTMs are often the highest trained medical professionals present. One PGHTM mentioned he or she had underestimated the level of education of local professionals. In the interviews, it was mentioned that PGHTMs often supervise the work of local professionals and sometimes have to check their work. Another PGHTM said:

> *"Usually there is quite a bit to improve in the treatment plan and diagnostics done by the clinical officers. So make new diagnoses, change treatments, use more diagnostics."- R10*

Working with local professionals also means dealing with cultural differences. This is important in the work of PGHTMs and sometimes causes difficulties. Respondents, however, observed that regardless of the setting they found themselves in, when starting a new job they will need to get to know their colleagues and gain their trust. This process takes time.

> *"It's the same when you go from surgery to gynecology. You have to get to know people, you have to understand work processes, people have to get to know you, know what you can do. I now have a lot of confidence from the other doctors as well as the nurses and clinical officers. And well, I also find out that we have a very good education. That we do have a broad view, but then the question is: You can correct people in a very bossy way, but also just in an educational way. If you do that in a respectful way, by telling them etc. It is also faster. That was difficult in the beginning. Especially if you don't have that trust yet." – R10*

### 3.2.7 Summary

The medical and non-medical work of PGHTMs is dependent on the setting they work in, and their colleagues. The medical work is typical for a generalist and includes many specialties, as can be seen in figure 4. The non-medical activities are a big part of their work, involving teaching, supervising and sometimes management tasks if they are part of management in their setting. Working with their colleagues is sometimes challenging because PGHTMs often are the highest trained medical professional present. On the other hand, when PGHTMs first arrive, they first observe and must gain trust of their colleagues. This combination can make it difficult to communicate with colleagues effectively. Lastly, the setting a PGHTM works in plays a big role in the type of work PGHTMs do, regarding the type of diseases seen, treatment available, possibilities for referrals and possible rules of organizations they work for.

## 3.3 The PGHTM

To give an accurate description of PGHTMs we must consider the following aspects: the perspective of a PGHTM, the characteristics, the strengths and weaknesses.

### 3.3.1 The perspective of a PGHTM

During the analysis, it was noticed that a PGHTM approaches work and maybe even life in general in a special way. Moreover, the characteristics of a PGHTM, described in the next section, are only partly the result of the training program. According to the respondents they are also attributable to the personalities of the individuals on entering the program.
An important part of the perspective of PGHTMs is the realization that you will not be able to help everybody while working in the field and that you need to be okay with this. On the other hand, PGHTMs described the limited facilities as very frustrating. Respondents stated that they coped with this, with the idea that what they could do for patients did more good than if they did not do anything.
Another noteworthy topic is that PGHTMs are aware of the responsibility that comes with, in many cases, being the highest educated medical professional available, in the low-resource setting where they work. For example, they supervise and teach other medical professionals procedures, so the PGHTM is not the only one capable of doing these procedures. Moreover, PGHTMs are aware of the impact they have on the community they serve and think about how to make their impact sustainable.
Perhaps the most notable thing about the perspective of PGHTMs is that they always look at the health care with a broad perspective and see the patient as a whole. They do not just consider the disease of the patient, or the reason for their visit to the doctor, but they regard the patient as an individual, following the bio-psycho-social health model (40). And want to give them the best achievable health care possible.

### 3.3.2 Characteristics of the PGHTM

Certain characteristics of PGHTMs were mentioned frequently during the interviews. According to the data, a PGHTM is adventurous, enthusiastic, assertive, inspiring, a leader, a team worker, takes on responsibility, thinks about impact, improvises, reflects, multitasks, has a just-do-it attitude, aims the best attainable care, looks at a situation calmly, first observes than acts, can prioritize, works independently, handles stress well, has a broad clinical mind, works holistically, knows his or her limitations, takes a macro perspective, and thinks logically.
A word cloud representing the traits of PGHTMs, as mentioned in the interviews, is included in figure 5. The characteristics of the PGHTM enable them to cope with the challenges they face, as will be discussed later on.

During the interviews, PGHTMs described their career path up until they entered the training program. Multiple PGHTMs mentioned they had been in a low-resource setting before, for instance as part of a tropical internship during their master's in medical sciences. Many PGHTMs had gained experience working as a 'doctor not in training' for a specialty. The specialties where PGHTMs had worked were: surgery, pediatrics and most in the emergency room (ER). Some PGHTMs directly started the training program after graduating medical school. They experienced the start of the hospital residencies as tough. Since they had no doctor's experience in a hospital setting, outside of their clinical rotations.

### 3.3.3 The strengths and weaknesses of the PGHTM

The professional role of a PGHTM is highly dependent on the setting he or she works in. Some PGHTMs work in district hospitals, others in university hospitals or private hospitals. Some work with non-governmental organization (NGO) projects, run by organizations like MSF or Capa Care (41). All these different settings ask for a different approach. According to PGHTMs, one of the strengths of PGHTMs is that through education and experience they are broadly trained to handle a wide spectrum of challenges and different situations adequately. PGHTMs talked about a set of skills they had acquired that can be used anywhere.

> *"Uhm, yes, I think it's kind of the broad view that you learn as a tropical doctor. And I think that is on many levels. You learn to deal with very broad complex problems. But you also learn a lot about, literally looking beyond borders. And you learn to look at patients, the entire system in which a patient functions, so to speak. What factors play a role in, say, illness and health of that person. So yeah, that's kind of, yeah what I think I find most valuable also when I look at how I'm going to continue as a doctor after this. That I have that background. I think that is very applicable in many settings." – R04*

Secondly, some PGHTMs noted that they are not perfectionists and were more familiar with the 'just do it'-attitude described earlier.
Thirdly, PGHTMs were happy with the social capital they had built up through the years in training, consisting mostly of other PGHTMs. They often discussed cases with other PGHTMs and found strength in each other's stories when they were experiencing difficult times abroad, for example, by sending specific case information to other PGHTMs that work in similar settings.
Lastly, PGHTMs took the traits they developed as a PGHTM with them in their new job back in the Netherlands. For example, in their work they think about the impact they have on the Dutch health care system in general and they take a holistic perspective towards their patients. Not only looking at the medical aspect, but also the social and psychological environment of the patient. And, because they have obtained a lot of clinical experience, they feel more comfortable taking on responsibility in Dutch hospitals.

### 3.3.4 Summary

The PGHTM has a unique perspective and characteristics (figure 5). They feel a responsibility for the health care system they are a part of and try to improve it. Their perspective and characteristics can party be attributed to the training program but is also attributable to their personality. A big strength of the PGHTM is that he or she has a broad set of skills useful in many different settings. A weakness in a Dutch setting could be that PGHTMs do not describe themselves as perfectionist. However, this trait is useful in a low-resource setting.

## 3.4 Challenges of work PGHTM and how they handle this

The respondents described several challenges PGHTMs encounter. These challenges can roughly be divided into two different categories:

- Challenges during training

- Challenges during work in a low-resource setting and going abroad as a PGHTM for the first time

In addition to describing the challenges, the respondents also discussed ways PGHTMs cope with these challenges. It can be noticed that the characteristics of PGHTMs help them cope with and overcome most challenges. But when they start working, they often still need to grow in this ability.

### 3.4.1 Challenges during training

In the training program, some PGHTMs encountered certain challenges. Often this had to do with the host hospital they were stationed in or the ability to connect the clinical work in the Netherlands to the work field in a low-resource setting. The challenges mentioned by PGHTM were the following:

- PGHTM were sometimes seen and treated as specialists 'not in training'.
- PGHTM do not always receive sufficient chances to get experience and the opportunity to do enough procedures.
- The connection between the residencies and the work field in a low-resource setting was not always a part of the training.
- PGHTM sometimes felt they missed certain competencies, for which they arranged training themselves
- For the mother-child profile the change from pediatrics to OBGYN was often challenging because they had no surgical experience.
- One PGHTM mentioned that the common thread in the training program was sometimes difficult to see. This made it difficult to stay motivated and understand the value of parts of the training program.

### 3.4.2 Challenges in work in a low-resource setting

During the interviews, PGHTM discussed some of the difficulties they faced working in a low-resource setting. PGHTM stated they saw these challenges as learning experiences and used their positive 'just do it'- attitude to cope with them.

Going abroad for the first time was described by the respondents as an intense and steep learning curve. They were happy to put into practice what they had learned but were also cautious to change a lot at the beginning. This because, the global health residency had taught them to first observe and then act, having to consider the cultural differences present.

Because PGHTMs are trained as generalists, they sometimes lack specific or detailed knowledge in both the medical and non-medical field. When they experience such a situation, they consult fellow PGHTM or books, look for advice online, and search in the NTC documents they have taken with them.

Some challenges are specific to a low-resource settings. For example, patients often present with much further advanced medical problems than what PGHTMs had seen during their training in the Netherlands. For example, what would have been a patient with a simple tooth extraction, presents him- or herself with a widely spread facial abscess with necrotic tissue. Another example is that, in the field, PGHTMs often have to make diagnoses with fewer clues, due to the minimal diagnostic facilities available. The same goes for the treatment plan, which is often different from possibilities in the Netherlands because of the difference in health care available. PGHTM noted that the limited options are a cause for

frustration and sometimes provide high stress-levels. Some PGHTM mentioned that the high stress-levels and long working hours could lead to conflict situations with colleagues. Such situations often had a big personal impact on the PGHTM.

Another challenge PGHTM faced was working with local colleagues. This is challenging because of two things. First, when PGHTMs start working somewhere for the first few months they must observe and earn the trust of their local colleagues and observe. Most PGHTM described this as important, but very difficult.
Secondly, because there are cultural differences, PGHTM must learn how to work together, this is a process. For example, many PGHTMs described that they have to give very detailed instructions to clinical nurses. This is different to the Dutch setting, where this is often not necessary or appreciated.

### 3.4.3 Summary

PGHTMs face different challenges in their career. In the training program, the biggest challenge was creating a good learning environment if the host hospital did not recognize the needs of PGHTMs in training regarding the type or the amount of practice required for a low-resource setting. This low-resource setting was one of the biggest challenges later in their work. Mostly because of the limited diagnostic, treatment, and referral options. The perspective and characteristics of a PGHTM, as described earlier, helped them overcome most of these challenges.

## 3.5 Current dilemmas

During the interviews, PGHTMs also described some complex issues involved in their work or concerning the training program.
An important issue is about what the role and impact of a doctor from a high resource setting in a low resource setting should be. On the one hand, the lack of highly trained medical professionals in this setting is seen as a good reason to work there. In addition, PGHTMs acknowledge that their role in the health care system should not remain essential and that the ownership of the healthcare system in a country belongs to the local people. PGHTMs try to take into account this dilemma by training local medical professionals and transfer their knowledge. They call this capacity building. They try to teach others how to do improve their skills and to do the job PGHTMs presently do, so that in the long run they will not be needed anymore. According to PGHTM, there are already countries where the current role of the PGHTM has no additional value.

> *"I think it should in any case be a project aimed at capacity building. So really say that knowledge transfer. I actually think that places where you only work as a clinical, that you clinically don't really add anything, well maybe now, but in the end not really for a long time not make a long-term contribution, so a project aimed at capacity building. A project in which you can make a link with public health or primary care. I think those are places where we can really add value." – R07*

Another challenge is the future of the PGHTM. According to respondents there are fewer and fewer places for PGHTMs to work. The respondents regard this as positive because it means that the health care systems in LMICs are becoming more stable.

The regions where PGHTMs will still be needed are those where not sufficient medical health professionals are present, or where the health care system is unstable, for example in disaster relief settings or warzones.
The last topic is related to the training program and regards the balance between the duration of the program and the time PGHTMs spend in the field after graduation. Some PGHTMs think the program should be extended to adequately train future PGHTMs in all competencies needed in the field. Other respondents fear that if the program will be extended, less time is available for working in a low-resource setting, given the fact that in general PGHTMs only spend several years learning and working as PGHTM. According to respondents, it is better to be a little more green and learn in the field, than to extend the program and spend less time in the field. One of their fears is that spending less time in a low-resource setting could make their work unsubstantial.
Important for the future of the PGHTM is also the continued existence of the education program and the training institution. This is highly dependent on financial support and the recognition of the importance of the PGHTMs in the Netherlands.

# 4 DISCUSSION

## 4.1. Conclusion

A qualitative study using semi-structured interviews was done to explore what is needed to train Physicians of Global Health and Tropical Medicine (PGHTMs) adequately for their work in low-resource settings. In total 23 PGHTMs were asked about their opinions on and experiences in the training program and working in a low-resource setting.

### 4.1.1 Competencies acquired during the training program

Most PGHTMs stated the OIGT taught them the right competencies to work adequately in a low-resource setting. Amongst these competencies were medical competencies in surgery, gynecology, pediatrics, and treatment of tropical diseases. PGHTMs from the mother-child profile were content with their education but mentioned the difference in severity of sickness in children between the Dutch and low-resource setting.

PGHTMs from the classical profile mentioned that learning surgical competencies was challenged by the high number of laparoscopic surgeries done in the Netherlands. This means there are less opportunities for PGHTMs to learn how to do open procedures similar to those done in low-resource settings.

Other competencies acquired by PGHTMs were non-medical, like how to run a hospital or how to keep the focus on public health, especially during the NTC.

The global health residency was seen as valuable by PGHTMs. According to the respondents, this residency was a good opportunity to practice what they were taught in a 'controlled' low-resource setting. Controlled, because they still had supervision and were not the physician in charge.

One substantial challenge was that the quality of the program was highly dependent on the host hospital in the Netherlands where the PGHTM was stationed. A reason for this was the effort supervisors put into the learning process of the PGHTM. In cases where PGHTMs were happy with their host hospital, their supervisor would invest in their training by involving them in interesting cases for a low-resource setting, would give additional information valuable in a low-resource setting, and would exempt PGHTMs in training from procedures not useful for them. In cases where PGHTMs were unhappy with their host hospital, their supervisor did not provide such tailored support.

The program also taught PGHTMs to be responsible for their own learning process, which trained PGHTMs amongst other things to be assertive in their work. For example, many PGHTMs acquired extra competencies outside of the program like making ultrasounds and administering anesthetics.

### 4.1.2 The work field of a PGHTM

The work of a PGHTM consist of medical work and non-medical work. All specialties are represented in the medical work, from internal medicine and surgery to dermatology and neurology. The PGHTM can be seen as a generalist.

The non-medical work focuses on capacity building by supervising local colleagues and the transfer of (medical) knowledge. Some PGHTMs were working as medical superintendent. In these cases, the work of a PGHTM also entails management work, hospital finances and pharmaceutical work.

Another part of the work of PGHTMs is interacting with their - mainly local - colleagues. Many PGHTMs state the cultural differences make it difficult to work together with locals.

Especially clear communication between PGHTMs and local personnel is a struggle when they first start working in a new setting.
The PGHTMs trained with the mother-child profile have a specific work field. They often work in hospitals where other physicians are present providing surgical care.
According to many PGHTMs the incidence (or awareness) of NCDs is increasing in their patient populations. Although right now, mainly the complications of these diseases are seen and treated, for example hypertensive crisis, stroke, or diabetic ketoacidosis. Some PGHTMs explained that chronic diseases are very difficult to treat in a low-resource setting due to the costs of medication and unawareness of the complications involved.

### 4.1.3 Competencies required by PGHTMs

The competencies required by PGHTMs are dependent on the setting where they work. PGHTMs should be good at supervising and teaching. In addition, PGHTMs need to have a broad medical skillset, and be inventive because of working with limited resources.
PGHTMs also need to look differently at health care compared to what is expected of them in the Dutch setting. For example, in addition to their role as a medical professional, they look at health care from a macro level and try to find ways to sustainably improve the local health care system. At the same time they must accept the fact that they cannot help everybody.
To cope with the challenges in the field, a PGHTM must understand that they learn by practice. Interestingly, the characteristics of 'the' PGHTM help them to face and even overcome these challenges. According to some PGHTMs, it is possible to acquire additional medical knowledge in the field, but their characteristics were important from the start to work adequately in a low-resource setting.

### 4.1.4 Discrepancies between the training program and the work field

There are a few competencies PGHTMs felt were required when going in the field but which they did not specifically receive in training. Firstly, PGHTMs spend a lot of their time teaching others. However, they are not specifically trained to do this during the program, and if so they did not remember this clearly or use this training in their daily work.
Secondly, all PGHTMs have access to an ultrasound and in all cases either PGHTMs do not use the full diagnostic application of the ultrasound or are (self) taught in the field. In the training program, only the obstetric ultrasound is taught.
Third, PGHTMs often treat internal medicine patients with NCDs (diabetes mellitus, hypertension, heart disease). However, some PGHTMs feel inadequately competent in treating these patients, since they have had no specific clinical training for these diseases.
Fourth, the PGHTMs trained with the classical profile (surgery and OBGYN) often feel inadequately trained in treating children in the field. Multiple PGHTMs would have liked to have had some training in pediatrics before starting to work independently.
Another difference is the severity of the medical cases they are presented with. Often diseases are further progressed than PGHTMs have seen in training in the Dutch setting. Furthermore, when PGHTMs start working in low-resource settings they acknowledge they still have a lot to learn and need to grow in experience. However, this is not seen as a problem by PGHTMs, since they can already be of value at that time and still continue learning.
Lastly, PGHTMs often experience difficulties communicating with local colleagues. The PGHTMs remember they were trained how to communicate with patients and even local

government. However, they cannot remember any specific training in communicating with local colleagues.

### 4.1.5 Future needs

The interviewed PGHTMs noticed a few changes in their work that could influence the work and role of PGHTMs in the future. First the general need for PGHTMs in the field. Some respondents mentioned that the number of classical workplaces for the PGHTMs is decreasing. PGHTMs stated it will be important to keep evaluating the role of the PGHTM in a low-resource setting and adjust the training program to this role.
Another matter PGHTMs faced was the question if doctors from HIC can still justifiably work in LMICs and low-resource settings. The overall answer was positive. The main reason being that there are not enough medical professionals right now to adequately provide health care for the local communities. However, PGHTMs did add that their work should always include capacity building.
Last, as mentioned earlier on, NCDs are becoming more prevalent in low-resource settings and LMICs where PGHTMs work. Right now, PGHTMs are not adequately trained in the program to treat these patients. The training program should be revised to include training on treating NCDs.

### 4.1.6 Conclusion

In conclusion, the findings of this study imply that the OIGT is succeeding in training PGHTMs adequately for their work in a low-resource setting at a global level. The addition of the global health residency plays an important part in this. However, there are a few discrepancies between what competencies are taught in the program and the ones that are required in the field. Examples are the use of ultrasound, clinical knowledge of NCDs or how to effectively train others. The biggest weakness of the program is the diversity in the quality of supervision in the host hospitals in the Netherlands. This is especially important, because the supervision plays a big role in the type of training the PGHTMs receive. Lastly, it is important to keep evaluating the role of the PGHTM in LMICs and adjust the training program accordingly.

## 4.2 Findings compared to other research

No study has evaluated the Dutch training program for the PGHTM like this before. However, some international studies have explored the competencies that should be included in global health curriculums. These competencies included amongst others: leadership, cultural competency and environmental, social and economic determinants of health. (42,43) These competencies are partly included in the NTC program.
In this study, PGHTMs sometimes felt inadequately trained in communicating with their local colleagues. Interestingly, the KIT does have multiple training courses specifically for intercultural communication, for example a course called ‘future proof teams & global leadership’ (44). Right now, this course is not part of the NTC that all PGHTMs follow during their training (45). The Dutch ministry of foreign affairs also intensively trains employees in effectively working abroad, including training in communication and intercultural management. They do this through the ‘Young Experts Programme’ (46,47). One PGHTM mentioned this program during the interview and thought parts of the program could have been useful in their training as well, especially when a PGHTM goes abroad for the first time.

Another challenge some PGHTMs described was the treatment of NCDs. The NTC does teach NCDs with the session 'non-communicable diseases in low income countries' (45). The London School of Hygiene and Tropical Medicine also teaches the management NCDs in their course (21). Comparing the Dutch program to the British one could help preparing PGHTMs better for treating NCDs in the future.

## 4.3 Strengths and limitations

The strengths and limitations of this study are discussed based on the 'quality criteria in qualitative and quantitative research' by Frambach et al. (48).

To ensure the credibility of the research, this study is part of a research project to look at the needs for the training program from multiple sides. This process is called triangulation (35). Moreover, respondents were sent the transcript of the interview, so they could give remarks. However, a limitation of this study is that the definitive findings are not yet presented to them.

Multiple measures were taken regarding the transferability of the data. First of all, the findings were described in great detail with quotes for further clarification. Secondly, through purposive sampling, a wide variety of PGHTMs was interviewed. This to make sure the findings correctly represent the opinions and experience of 'the PGHTM'. However, it was difficult to compare the findings of this study to other research, since no similar studies could be found.

A strength of this study is that data was collected until no new themes emerged from the data, known as theoretical saturation. The limited time available to continuously go back and forth between transcripts to recode could have caused themes to be missed. However, the transcripts were read multiple times before coding, and all interviews were held, transcribed and coded by the same researcher (IT), therefore limiting the chance to miss findings as much as possible. In addition, the researcher had no reason to influence the results, since there are no connections with the OIGT and nothing to gain or lose from the outcomes of this study.

The head researcher did not have experience with qualitative research. So, to ensure the quality and confirmability, the research process was guided by a group of researchers with experience in scientific qualitative studies and in the field of global health and tropical medicine. In addition, the head researcher kept notes on the research process and frequently consulted the aforementioned research group.

A last limitation of the study is that the data was not coded by a second researcher to ensure a systematic approach to coding, known as inter-rater-reliability. In addition, to further confirm the findings, focus groups could have been held in which primary findings could have been discussed where PGHTMs were not unanimous in their answers.

## 4.4 Future research

This study is part of a research project evaluating the current training program of the OIGT. The findings of that research project will be used to finetune the revision of the training program for 2025-2030. This study was the first part of the project. The findings of this study can be used as a theoretical framework for the following studies in the project. The second part is a quantitative study to see if PGHTMs are adequately trained for their work in low-resource settings at a global level. This study provides the necessary information to create a research instrument for the quantitative study.

A few important topics that require further research in this quantitative study are the adequacy of supervision by host hospitals in the Netherlands, the need for general ultrasound training, the limitations of laparoscopic surgery for the learning process of PGHTMs, the need for a teach-the-teacher course, the need for inter-cultural communication between colleagues, and the need for information on treatment of NCDs in the curriculum.
Part three of the research project looks at the opinions and experiences of the host institutions for the global health residency. This study did not particularly focus on host institutions. However, this study did show the importance of the global health residency for the PGHTMs' learning process. These results can be used as the rationale for the study into the host institutions.
In addition, the framework of this study can be used by other training institutes around the world to explore to what extent their programs train physicians adequately to work in global health and tropical medicine.
This study shows that the OIGT adequately trains PGHTMs to work in low-resource settings at a global level. No research however has looked at the impact these PGHTMs make in these settings. Future research should be done to look at the global effect of the PGHTM. One reason for conducting such research is that PGHTMs are highly motivated to sustainably improve health care in low-resource settings and to increase health equity. It would be interesting to see if this is actually achieved.
Moreover, this study implies that part of the adequacy of a PGHTM is due to the training program and another to the personal characteristics of the people who enter the program. More research could be done to study the relationship between the training program and these personal characteristics of aspiring PGHTMs.

## 4.5 Recommendations

The results from the entire revision project will show which competencies to what extent should be added to the training program. However, the OIGT could consider using the findings of this study to start adjusting the program. Based on the results, the following recommendations are made (figure 6):

- The OIGT should try to minimize the differences between the supervisors and differences between host hospitals in the Netherlands.
- The OIGT should consider the incorporation of ultrasound training, treatment of NCDs, basic pediatric knowledge for PGHTMs of the classical profile, intercultural communication with colleagues, and a teach-the-teacher training in the curriculum of PGHTMs.
- The OIGT should foster good relations with the host institutions of the global health residency, since this part of the program is essential to the training of PGHTMs.
- The OIGT should keep evaluating the role of the PGHTM in LMICs and low-resource settings, and adjust their program accordingly.

Hopefully the results of this study and the following will improve the training program of the OIGT and educate future PGHTMs to help increase health equity worldwide.

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# 6 Figures and Appendices

## 6.1 Figures

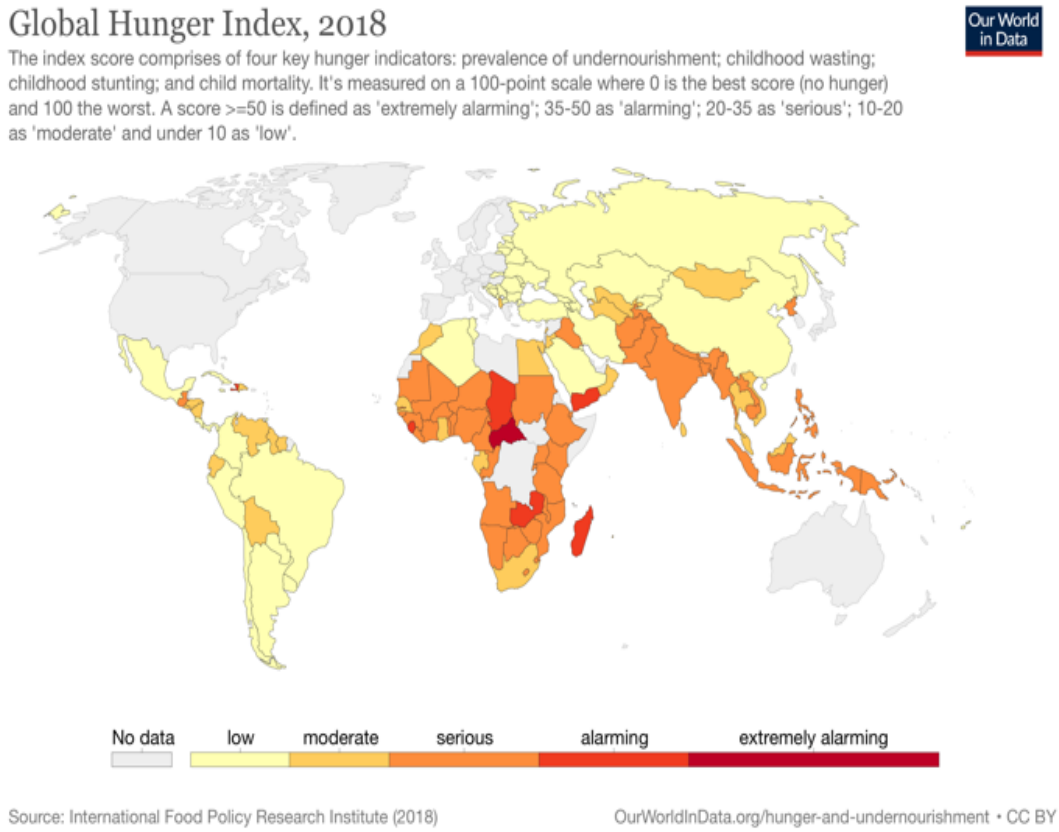



*Figure 1: Global Hunger Index, Our World in Data*

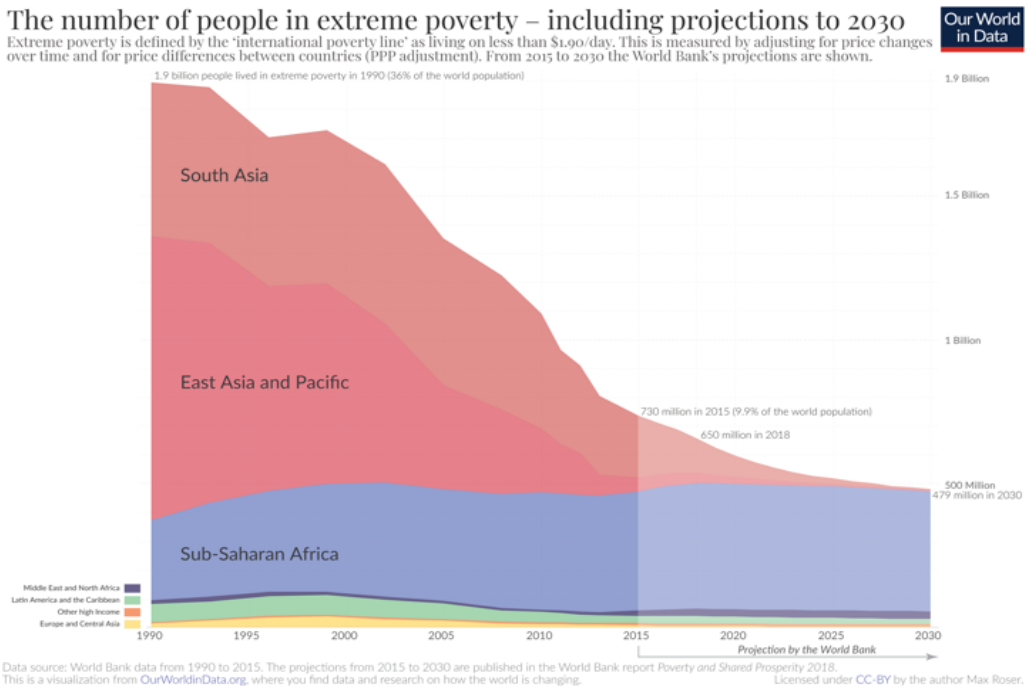



*Figure 2: number of extreme poverty, Our World in Data*

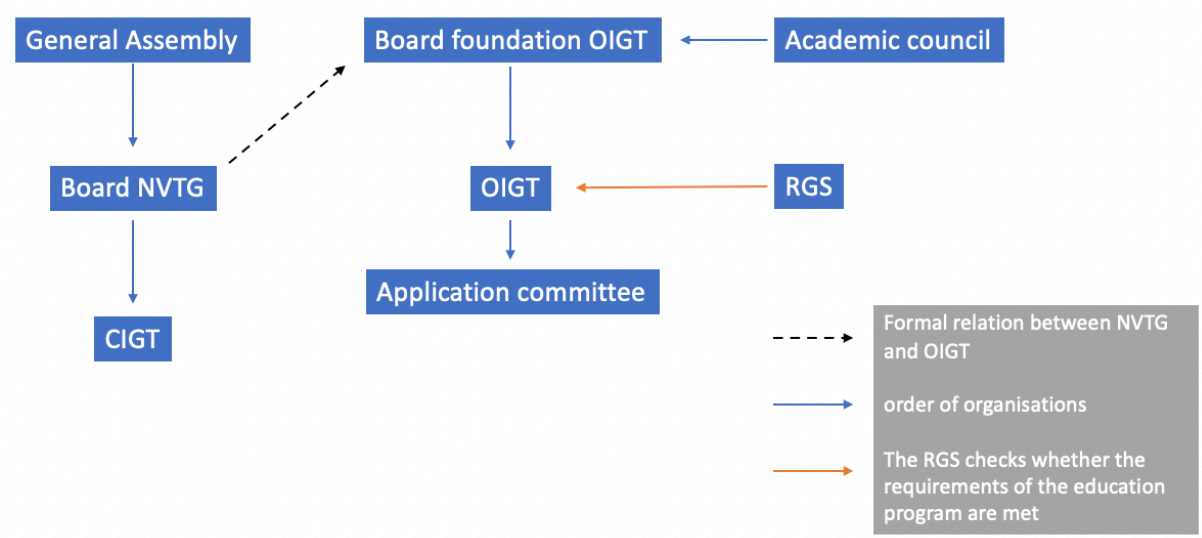



*Figure 3: Based on Dutch version (30), for meaning abbreviations see 'List of abbreviations' p.2*

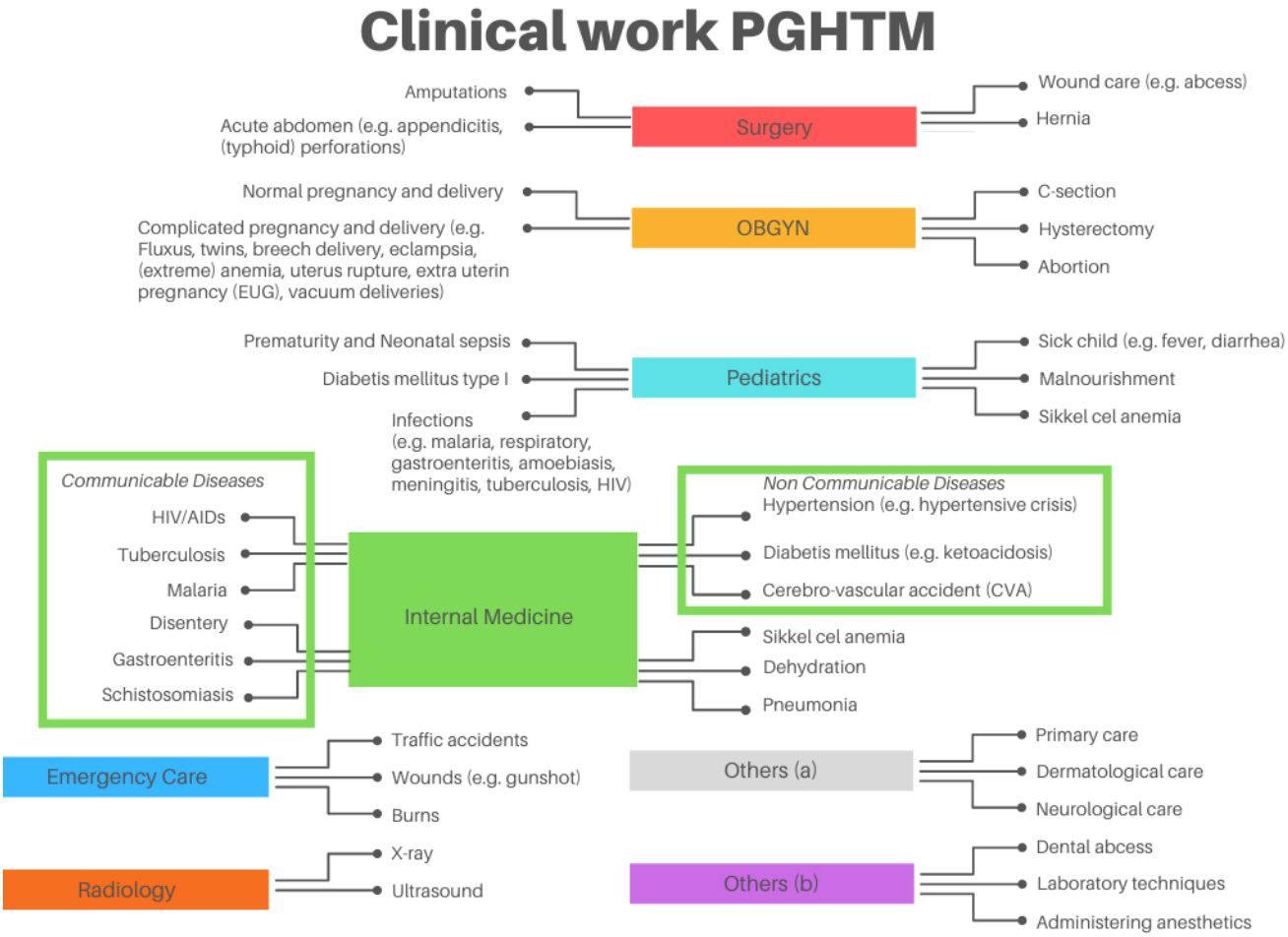



*Figure 4: clinical work PGHTM*


*Figure 5: word cloud of competencies PGHTM*

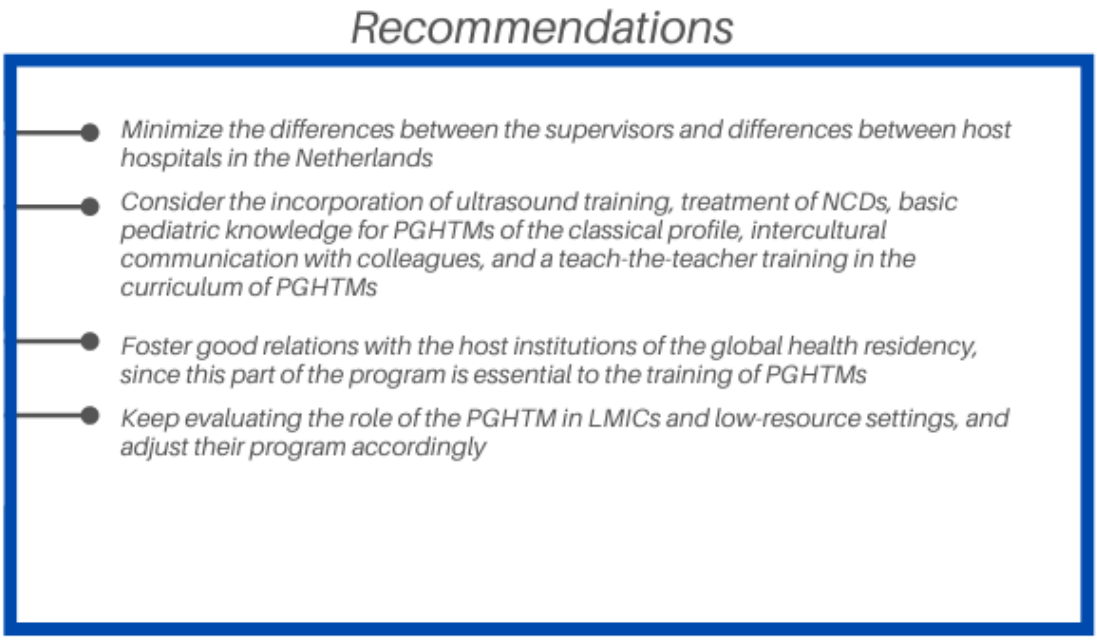



*Figure 6: Recommendations based on findings*

## 6.2 Appendices

### A. COREQ checklist

The template was provided by Elsevier (49).

**COREQ (COnsolidated criteria for REporting Qualitative research) Checklist**

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

| Topic | Item No. | Guide Questions/Description | Reported on Page No. |
|---|---|---|---|
| **Domain 1: Research team and reflexivity** | | | |
| *Personal characteristics* | | | |
| Interviewer/facilitator | 1 | Which author/s conducted the interview or focus group? | 12 |
| Credentials | 2 | What were the researcher's credentials? E.g. PhD, MD | 1 |
| Occupation | 3 | What was their occupation at the time of the study? | 0 |
| Gender | 4 | Was the researcher male or female? | 2 |
| Experience and training | 5 | What experience or training did the researcher have? | 10 |
| *Relationship with participants* | | | |
| Relationship established | 6 | Was a relationship established prior to study commencement? | 11 |
| Participant knowledge of the interviewer | 7 | What did the participants know about the researcher? e.g. personal goals, reasons for doing the research | 42-43 |
| Interviewer characteristics | 8 | What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic | 0, 10 |
| **Domain 2: Study design** | | | |
| *Theoretical framework* | | | |
| Methodological orientation and Theory | 9 | What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis | 10 |
| *Participant selection* | | | |
| Sampling | 10 | How were participants selected? e.g. purposive, convenience, consecutive, snowball | 10 |
| Method of approach | 11 | How were participants approached? e.g. face-to-face, telephone, mail, email | 11 |
| Sample size | 12 | How many participants were in the study? | 11 |
| Non-participation | 13 | How many people refused to participate or dropped out? Reasons? | 11 |
| *Setting* | | | |
| Setting of data collection | 14 | Where was the data collected? e.g. home, clinic, workplace | 13 |
| Presence of non-participants | 15 | Was anyone else present besides the participants and researchers? | NA |
| Description of sample | 16 | What are the important characteristics of the sample? e.g. demographic data, date | 11 |
| *Data collection* | | | |
| Interview guide | 17 | Were questions, prompts, guides provided by the authors? Was it pilot tested? | 44-48 |
| Repeat interviews | 18 | Were repeat inter views carried out? If yes, how many? | NA |
| Audio/visual recording | 19 | Did the research use audio or visual recording to collect the data? | 12-13 |
| Field notes | 20 | Were field notes made during and/or after the inter view or focus group? | 13 |
| Duration | 21 | What was the duration of the inter views or focus group? | 12 |
| Data saturation | 22 | Was data saturation discussed? | 11-12 |
| Transcripts returned | 23 | Were transcripts returned to participants for comment and/or | 12 |

| Topic | Item No. | Guide Questions/Description | Reported on Page No. |
|---|---|---|---|
| | | correction? | |
| **Domain 3: analysis and findings** | | | |
| *Data analysis* | | | |
| Number of data coders | 24 | How many data coders coded the data? | 12 |
| Description of the coding tree | 25 | Did authors provide a description of the coding tree? | 13, 49-54 |
| Derivation of themes | 26 | Were themes identified in advance or derived from the data? | 10, 13 |
| Software | 27 | What software, if applicable, was used to manage the data? | 12-13 |
| Participant checking | 28 | Did participants provide feedback on the findings? | NA |
| *Reporting* | | | |
| Quotations presented | 29 | Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number | 14-28 |
| Data and findings consistent | 30 | Was there consistency between the data presented and the findings? | 14-28 |
| Clarity of major themes | 31 | Were major themes clearly presented in the findings? | 14-28 |
| Clarity of minor themes | 32 | Is there a description of diverse cases or discussion of minor themes? | 14-28 |

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

**Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.**

## B. Search strategy literature study

| Search | Actions | Details | Query | Results | Time |
|---|---|---|---|---|---|
| #5 | | | Search: **#3 NOT #4** Sort by: **Publication Date** | 118 | 09:36:54 |
| #4 | | | Search: **("Tropical Medicine"[Majr] OR tropical [ti] OR "global health"[Majr] OR "global health"[ti]) AND ("learning"[MeSH] OR "education, medical" [MeSH] OR learning[tiab] OR educat*[tiab]) AND ("curriculum"[MeSH] OR curriculum[tiab] OR "needs assessment"[MeSH] OR (needs[tiab] AND assess* [tiab]) OR evaluat*[tiab])** Sort by: **Publication Date** | 826 | 09:36:31 |
| #3 | | | Search: **("Tropical Medicine"[Majr] OR tropical [ti] OR "global health"[Majr] OR "global health"[ti]) AND ("learning"[MeSH] OR "education, medical" [MeSH] OR learning[tiab] OR educat*[tiab]) AND ("curriculum"[MeSH] OR curriculum[tiab] OR competenc* OR "needs assessment"[MeSH] OR (needs[tiab] AND assess*[tiab]) OR evaluat*[tiab])** Sort by: **Publication Date** | 944 | |

## C. Informed consent

Letter of Informed Consent Research Learning Needs Assessment OIGT

Maart 2021, Amsterdam

Beste respondent,

Door middel van deze brief willen wij, het Concilium Internationale Gezondheid en Tropengeneeskunde (CIGT), u informeren over het onderzoek waar wij mee bezig zijn.

Om de AIGT opleiding te verbeteren zijn wij bezig met een learning needs assessment.
Het doel van deze evaluatie is om een beeld te krijgen in hoeverre AIGTs adequaat getraind zijn voor hun werk op wereldniveau met een focus op kwetsbare groepen. Dit wordt gedaan door het uitvoeren van kwalitatief onderzoek met semigestructureerde interviews en het houden van focusgroep discussies. Deze zullen gehouden worden in periode van 12 april 2021 tot en met 28 mei 2021.
U bent een van de AIGTs die wij voor dit onderzoek willen interviewen over uw professionele mening en ervaringen als AIGT.

Met deze brief willen wij u wijzen op de volgende punten.

Het interview wordt opgenomen en de data zullen bewaard worden voor vijf jaar. Dit geldt zowel voor de geanonimiseerde data als ook voor de complete data in het beheer van de hoofdonderzoeker (Isabelle Tiggelaar). Alleen de hoofdonderzoeker zal toegang hebben tot de complete data. De data zullen bewaard worden op een beveiligde externe harde schijf die alleen toegankelijk is voor de hoofdonderzoeker. De rest van de onderzoeksgroep krijgt toegang tot geanonimiseerde data zoals deze in het onderzoeksrapport verschijnen. De audio-opnames van het interview zullen na het transcriberen vernietigd worden. Al deze maatregelen zijn ervoor bedoeld om uw privacy te respecteren en te bewaren.

Tijdens het interview mag u op ieder moment kiezen vragen niet te beantwoorden of te stoppen met het interview. Ook kunt u op ieder moment aangeven niet (meer) mee te willen doen met het onderzoek. Dit kunt u doen door contact op te nemen met Isabelle Tiggelaar, via: i.g.tiggelaar@student.vu.nl. Zij zal dan uw informatie verwijderen. Uw data zal dan niet gebruikt worden voor het onderzoek. Er zijn geen gevolgen van het stoppen van uw deelname.

Deelname aan het onderzoek kan de volgende voor- en nadelen hebben:

- Gezien het geringe aantal AIGTs, kennen veel mensen elkaar en bestaat er een mogelijkheid dat mensen uw deelname herkennen in het rapport. Om deze kans zo klein mogelijk te maken heeft alleen de hoofdonderzoeker toegang tot de complete data en zal alle data bewaard worden op een beveiligde externe harde schijf in het beheer van de hoofdonderzoeker. De hoofdonderzoeker is zelf niet werkzaam als AIGT.
- Gezien de huidige COVID-19 pandemie zullen alle interviews online gehouden worden en focus groep discussies alleen mits de huidige overheidsmaatregelen dit toelaten. Anders wordt er gekeken naar de mogelijkheid om deze online te houden.

- De uitkomsten van dit onderzoek zullen gebruikt worden voor het herzien van de opleiding tot AIGT. Dit leidt tot een verdere professionalisering en erkenning van het vakgebied en draagt bij aan het beter functioneren van AIGTs wereldwijd.

Met de uitkomsten van het onderzoek hopen wij de aansluiting met het veld en de opleiding te hebben geëxploreerd en in de vorm van een rapport aanbevelingen te kunnen geven voor de opleiding tot AIGT.
Mocht u tijdens de onderzoeksperiode van gedachten veranderen over uw medewerking aan dit onderzoek of heeft u aanvullende vragen, dan kunt u contact opnemen met Isabelle Tiggelaar.

Door het ondertekenen van deze brief geeft u aan dat u voldoende bent geïnformeerd over uw deelname aan dit onderzoek en toestemming geeft voor het verwerken van de verkregen informatie, inclusief eventuele geanonimiseerde quotes.

Hopende u zo voldoende geïnformeerd te hebben.

Namens het CIGT,

Isabelle Tiggelaar
Masterstudent Geneeskunde
i.g.tiggelaar@student.vu.nl
+31634070914

Datum:

Naam respondent: Naam interviewer:

Handtekening: Handtekening:

Onderzoeksgroep:
Ed Zijlstra MSc DTM&H PhD, internist, Rotterdam Centre for Tropical Medicine; Chairman CIGT
Marianne van Elteren-Jansen, PhD, department ethics, law and humanities VUmc School of Medical Sciences, supervisor
Erica Janszen, MD, OLVG, member CIGT, supervisor
Maaike Flinkenflögel, MD, academic advisor MIH/NTC KIT, member CIGT
Jamilah Sherally, MD, PGHTM
Isabelle Tiggelaar, MSc student VUmc

## D. Interview questions and theoretical framework

**Kader**

De vragenlijst voor de exploratieve kwalitatieve studie naar professionele meningen en ervaringen van Artsen Internationale Gezondheid en Tropengeneeskunde (AIGT) van het Opleidingsinstituut Internationale Gezondheid en Tropengeneeskunde (OIGT) is gebaseerd op het volgende kader. Hiervoor is gekozen om de vragenlijst doelgericht te houden. Het doel van de vragenlijst is om resultaten te verzamelen die antwoorden geven op de onderstaande onderzoeksvraag en sub-vragen.

*Onderzoeksvraag:*

Wat is nodig om AIGT adequaat voor te bereiden voor werken op mondiaal niveau met een focus op kwetsbare groepen?

*Sub-vragen:*

- Welke competenties worden verworven door AIGT tijdens de opleiding?
- Hoe ziet het werk van een AIGT eruit en welke competenties zijn hiervoor nodig?
- Wat is de discrepantie tussen de verworven competenties in de opleiding en de nodige competenties in het werk?
- Welke competenties zijn in de toekomst nodig in de opleiding tot AIGT?

Het huidige opleidingsplan (2020-2025) omschrijft de volgende zeven globale competenties.

1. Medisch handelen
2. Communicatie
3. Samenwerking
4. Organisatie
5. Maatschappelijk handelen en preventie
6. Kennis en wetenschap
7. Professionaliteit en kwaliteit

Deze competenties zijn veel terug te vinden in andere medische curricula, waaronder die van de opleiding geneeskunde.

Om een AIGT in opleiding deze competenties aan de leren in het vakgebied van de Internationale Gezondheid en Tropengeneeskunde gebruikt het OIGT ‘Entrustable Professional Activities’ (EPAs). In het Nederlands zijn dit beroepstaken. Deze beroepstaken zijn onder te verdelen in drie thema’s:

1. Patiëntenzorg
2. Publieke gezondheid
3. Medisch leiderschap

Deze thema’s zijn vervolgens onderverdeeld in acht onderdelen. In het huidige opleidingsprogramma zijn dat de volgende onderdelen:

1. Generalist in patiëntenzorg
2. Het leveren van acute zorg
3. Het leveren van chronische zorg
4. Essentiele snijdende vaardigheden
5. Het leveren van maternale en perinatale zorg
6. Epidemiologie inclusief ‘burden of disease’
7. Kan preventieve zorg verlenen in global health context
8. Het managen en organiseren van zorg

De vragenlijst is opgesteld aan de hand van deze drie thema's en acht onderdelen. Per onderdeel wordt naar vier aspecten gekeken.

1. Competenties verworven in de opleiding
2. Competenties nodig is het werk als AIGT
3. Discrepantie tussen 1 en 2
4. Competenties nodig is de toekomst

Deze aspecten zijn gekozen om te waarborgen dat de resultaten antwoord geven op de onderzoeksvragen.

**Vragenlijst**

*Introductie*

Bedanken voor mogelijkheid interviewen, doornemen informed-consent brief en doornemen onderzoek: kwalitatief onderzoek van de opleiding AIGT van het OIGT, learning needs assessment.

*Blok 1* – Algemene Informatie

- Naam, leeftijd, geslacht, functie, werkgeschiedenis (waar, welke setting, hoe lang), opleiding (geneeskunde en AIGT, wanneer, waar, welke stroom AIGT opleiding? (klassiek, moeder/kind)
- Waarom heb je gekozen voor de opleiding tot AIGT?
    - Selectie (direct/indirect)
    - Kostenaspect

*Blok 2 Patiëntenzorg, Publieke Gezondheidszorg, Medisch Leiderschap, Onderwijs, Overig*

A. *Patiëntenzorg: (Generalist in de patiëntenzorg, leveren acute zorg, leveren chronische zorg, essentiële snijdende vaardigheden, leveren maternale en perinatale zorg)*
    a. Toen je begon met werken in een low-resource setting had je allemaal vaardigheden opgedaan die je op dat moment ging toepassen. Hoe was dat? Welke vaardigheden had je allemaal in je rugzak gestopt? Had je voldoende in je rugzak gestopt om te kunnen werken in een low-resource setting?
        i. Hoe heeft het faciliterende ziekenhuis bijgedragen aan het verwerven van deze vaardigheden?
        ii. Algemene vaardigheden (flexibiliteit, samenwerken, betrokkenheid)
        iii. Wat voor feedback kreeg je van je supervisors in het buitenland?
    b. Welke vaardigheden hiervan vind jij belangrijk?
    c. Welke vaardigheden hiervan vind jij minder belangrijk?

Na de opleiding ben je gaan werken als AIGT.

    d. Hoe zag de patiëntenzorg eruit in je tijd als AIGT?
        i. Waar heb je gewerkt, welke setting?
            1. Welk niveau (primary, secondary, tertiary, community health)
            2. Hoe groot is de population to reach?
                a. Hoeveel bedden?
            3. Hoe zou je het team omschrijven waarin je werkzaam was?
                a. Samenstelling (Arts, Verpleegkundigen, Clinical Officers)
                b. Taakverdeling
                c. Functioneren team
        ii. Wat hielden je werkzaamheden in op het gebied van patiëntenzorg?
            1. Algemene taken
            2. Chirurgie, Gynaecologie, Kindergeneeskunde
            3. Overig
                a. Acute zorg
                    i. Palliatieve zorg
                b. Chronische zorg
        iii. Wat was de verdeling tussen deze werkzaamheden qua tijd?
        iv. De werkzaamheden van de patiëntenzorg worden door de opleiding onderverdeeld in: chirurgie, gynaecologie, kindergeneeskunde, acute

zorg, chronische zorg. Waren er werkzaamheden die buiten deze gebieden vielen? (primary health care, community health)

e. Welke vaardigheden die je hebt geleerd tijdens de opleiding gebruik je in je dagelijks werk als AIGT?
    i. Op welke manier?
    ii. Was je voldoende toegerust in het uitvoeren van deze werkzaamheden door je opleiding tot AIGT?
f. Welke vaardigheden heb je geleerd in je tijd als AIGT? (Medische maar ook niet-medische vaardigheden (flexibiliteit, samenwerken, betrokkenheid))
    i. Welke van deze vaardigheden gebruikte je op dagelijkse/wekelijkse basis?
    ii. Op welke manier had je hier beter in toegerust kunnen worden tijdens de opleiding?
    iii. Welke van deze vaardigheden had je graag willen leren in je opleiding?
g. Welke vaardigheden uit je tijd als AIGT gebruik je nu nog in je werk?
h. Hoe is jouw werk als AIGT de afgelopen jaren veranderd?
    i. Op welke manier kan een toekomstige AIGT hier op voorbereid worden?

B. *Publieke gezondheidszorg: (Leveren maternale en perinatale zorg, Epidemiologie incl. burden of disease, Preventieve zorg in Global Health context)*
    a. Welke vaardigheden heb je geleerd tijdens de opleiding op het gebied van de publieke gezondheidszorg? Tijdens welk deel van de opleiding?
        i. Preventie
        ii. Burden of Disease
    b. Welke werkzaamheden in de publieke gezondheidszorg had jij als AIGT?
    c. Hoe belangrijk was dit onderdeel?
    d. Hoe is dit veranderd gedurende je tijd als AIGT?
    e. Welke vaardigheden op het gebied van de publieke gezondheidszorg heb jij later zelf moeten leren als AIGT?
        i. Hoe had je hier beter op voorbereid kunnen worden?

C. *Medisch Leiderschap: Managen en organiseren van zorg*
    a. Welke vaardigheden heb je geleerd tijdens de opleiding op het gebied van Medisch leiderschap? Tijdens welk deel van de opleiding?
        i. Management
        ii. Ontwikkeling lokale gezondheidszorg
        iii. Lange termijn verandering
    b. Hoe zag Medisch leiderschap eruit in jouw tijd als AIGT?
        i. Kan je hier voorbeelden van geven?
    c. Heb je aanvullende vaardigheden moeten leren op het gebied van medisch leiderschap tijdens je periode als AIGT?
        i. Welke?
        ii. Hoe heb je dit gedaan?
        iii. Hoe had je hier beter op voorbereid kunnen worden?
    d. Zijn er aspecten van medisch leiderschap veranderd in jouw tijd als AIGT?
        i. Welke?

D. *Onderwijs: overdragen van kennis*
    a. Wat voor rol had/heeft onderwijs geven in jouw werk? (Aan wie, welke setting, waar, waarover)
        i. Kan je een voorbeeld geven?
    b. Hoe heb je onderwijs leren geven in de opleiding tot AIGT?
    c. Welke vaardigheden, naast die geleerd in de opleiding, zijn nodig om goed onderwijs te kunnen geven?
        i. Hoe heb jij deze vaardigheden geleerd?

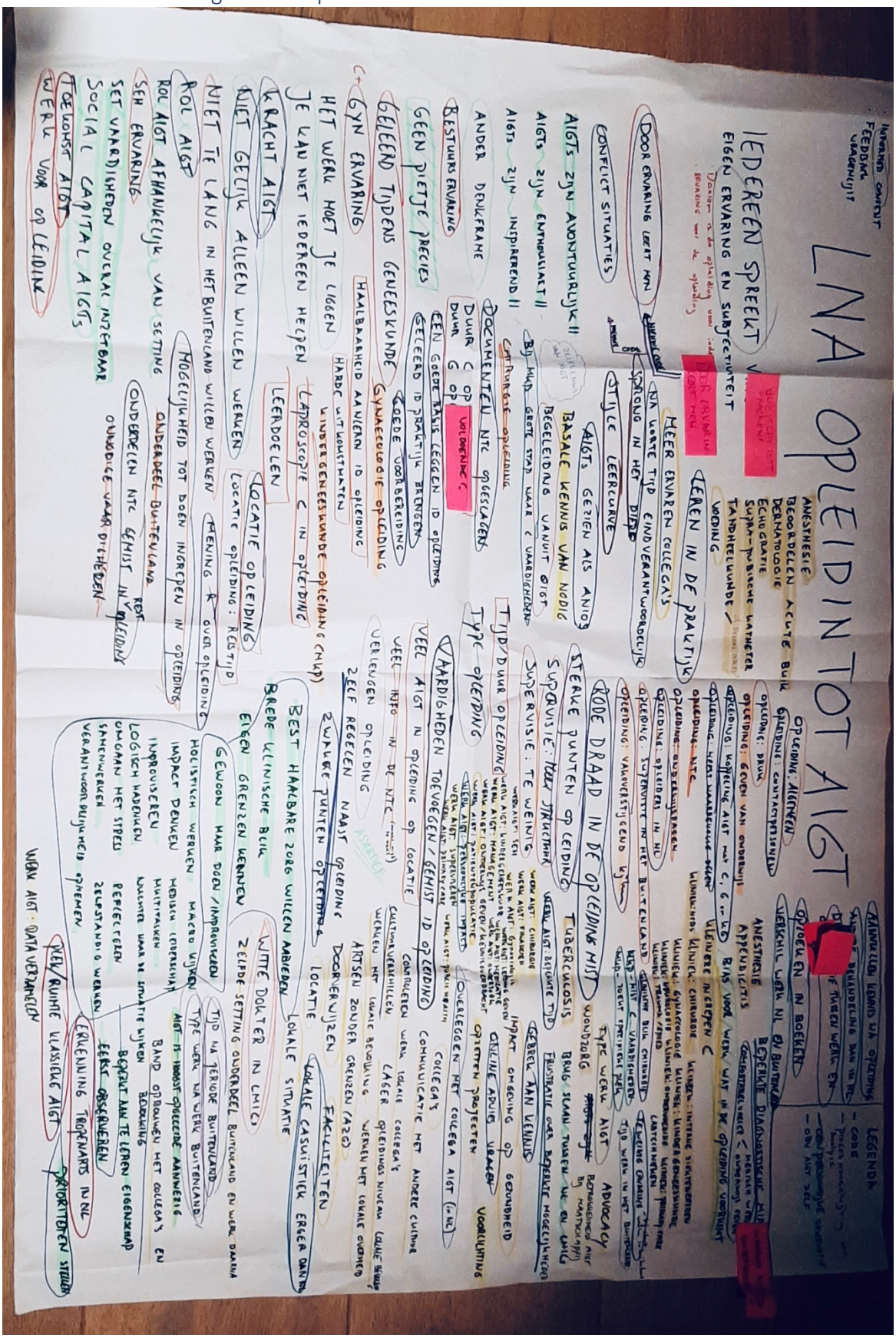
E. *Overige thema's*
    a. Wat waren onderdelen van jouw werk naast de thema's patiëntenzorg, publieke gezondheidszorg, medisch leiderschap en onderwijs?
        i. Hoe verhield zich dit tot jouw andere werkzaamheden qua tijd en prioriteit?
        ii. Hoe ben je hierop voorbereid vanuit de opleiding tot AIGT?
        iii. Hoe had je hier beter op voorbereid kunnen worden?
F. *Werk na werken op mondiaal niveau met kwetsbare groepen*
    a. Hoe ziet je dagelijkse werk er nu uit?
    b. Hoe gebruik jij de vaardigheden en kennis die je hebt geleerd in de opleiding en tijdens je werk als AIGT in je dagelijkse werk nu?
        i. Welke vaardigheden/ervaringen?
    c. Hoe draagt jouw tijd als AIGT bij aan jouw bekwaamheid voor jouw werk nu?
        i. Hoe zien collegae dit?

G. *De rol van de AIGT*
    a. Waar denk jij dat de AIGT de meeste (positieve) impact kan hebben?
        i. Wat zijn daarvoor de belangrijkste competenties naar jouw professionele mening?
    b. Welk onderdeel van wat je hebt geleerd in de opleiding heb je niet of het minst gebruikt?
    c. In het kort: Als je de AIGT zou moet omschrijven, hoe zou je dit doen?

H. *Afsluiting*
    a. Wat zou je nog willen toevoegen of benadrukken wat we in het laatste uur besproken hebben?

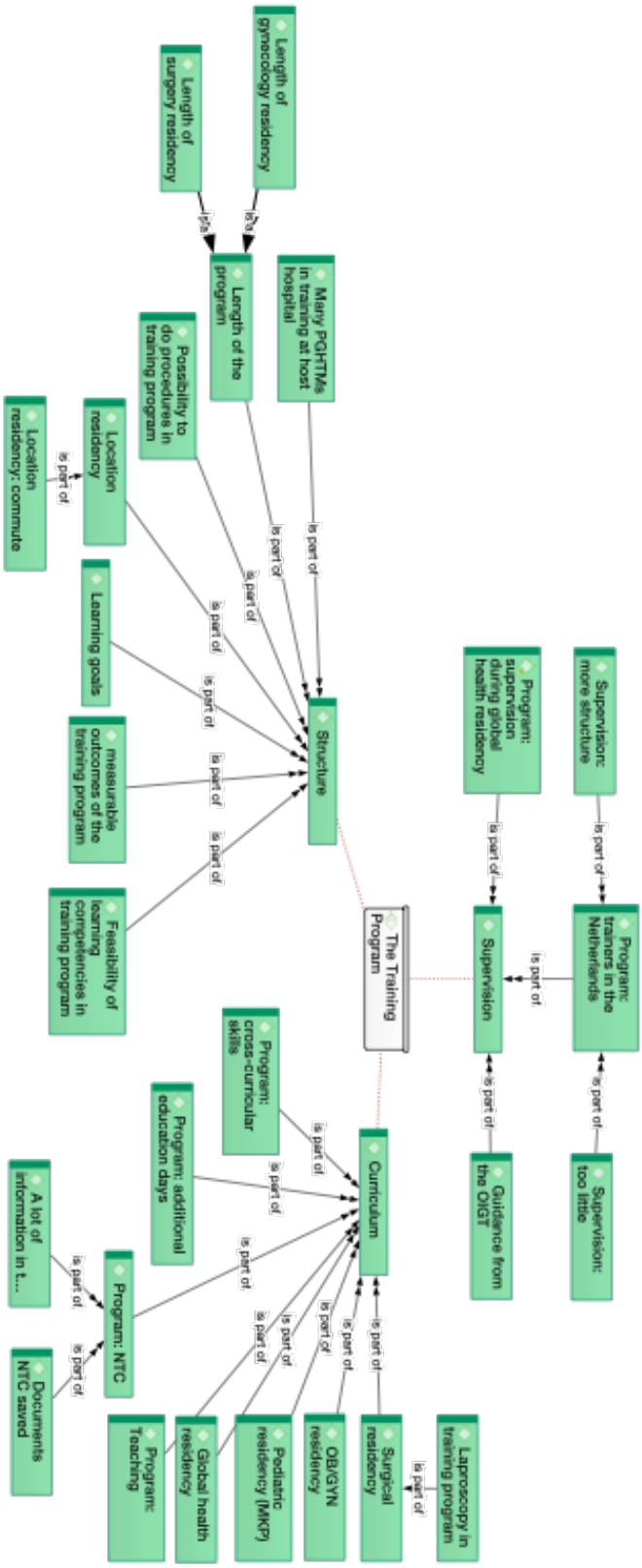
*Blok 3 – afsluiting*
Bedankt voor het interview, heb je nog feedback?
Op de hoogte stellen van de uitkomsten
Eventueel later benaderen voor verduidelijking of focus group discussion?

E. Manual axial coding mind-map

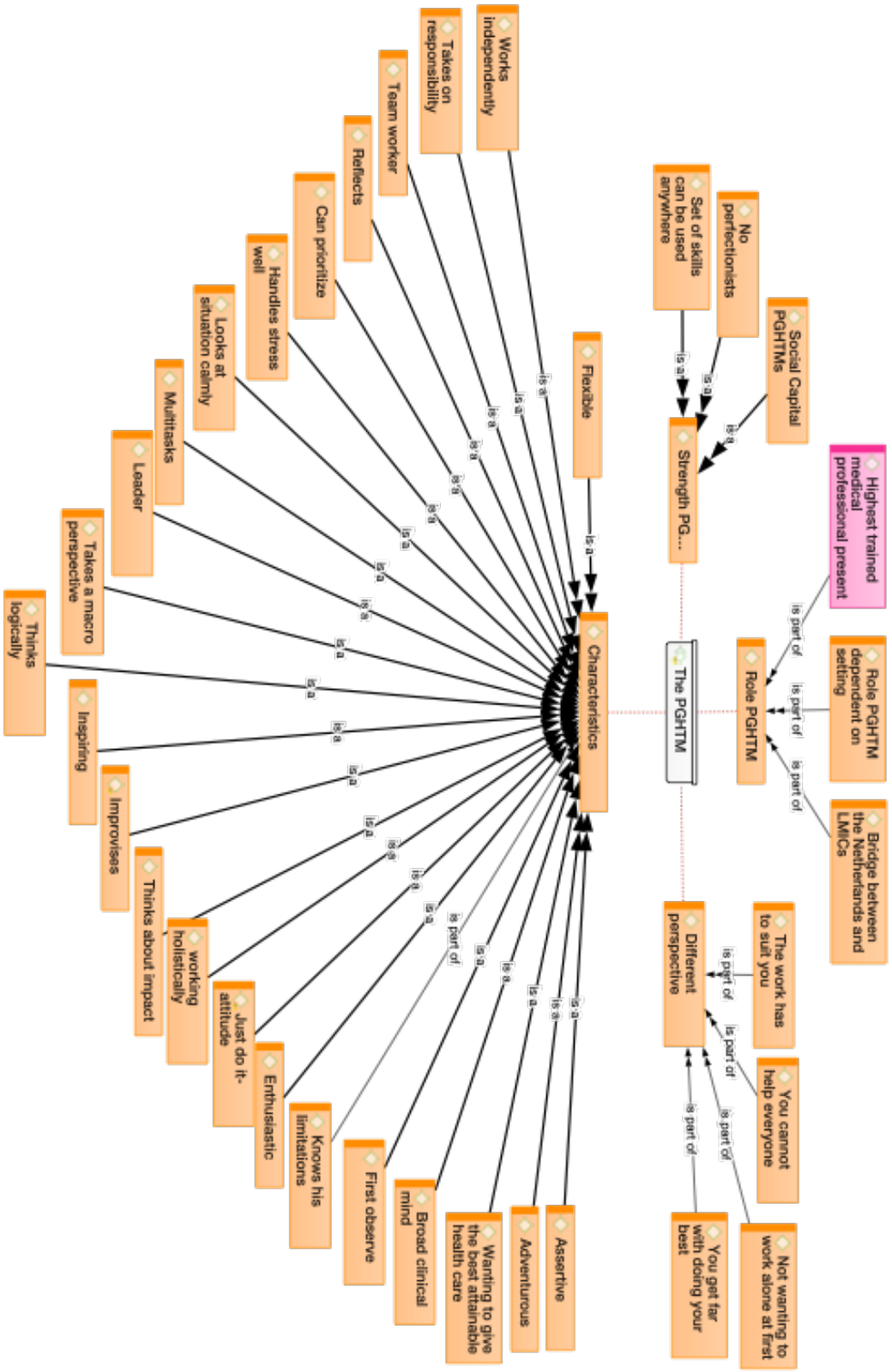


## F. Code Networks Atlas ti.

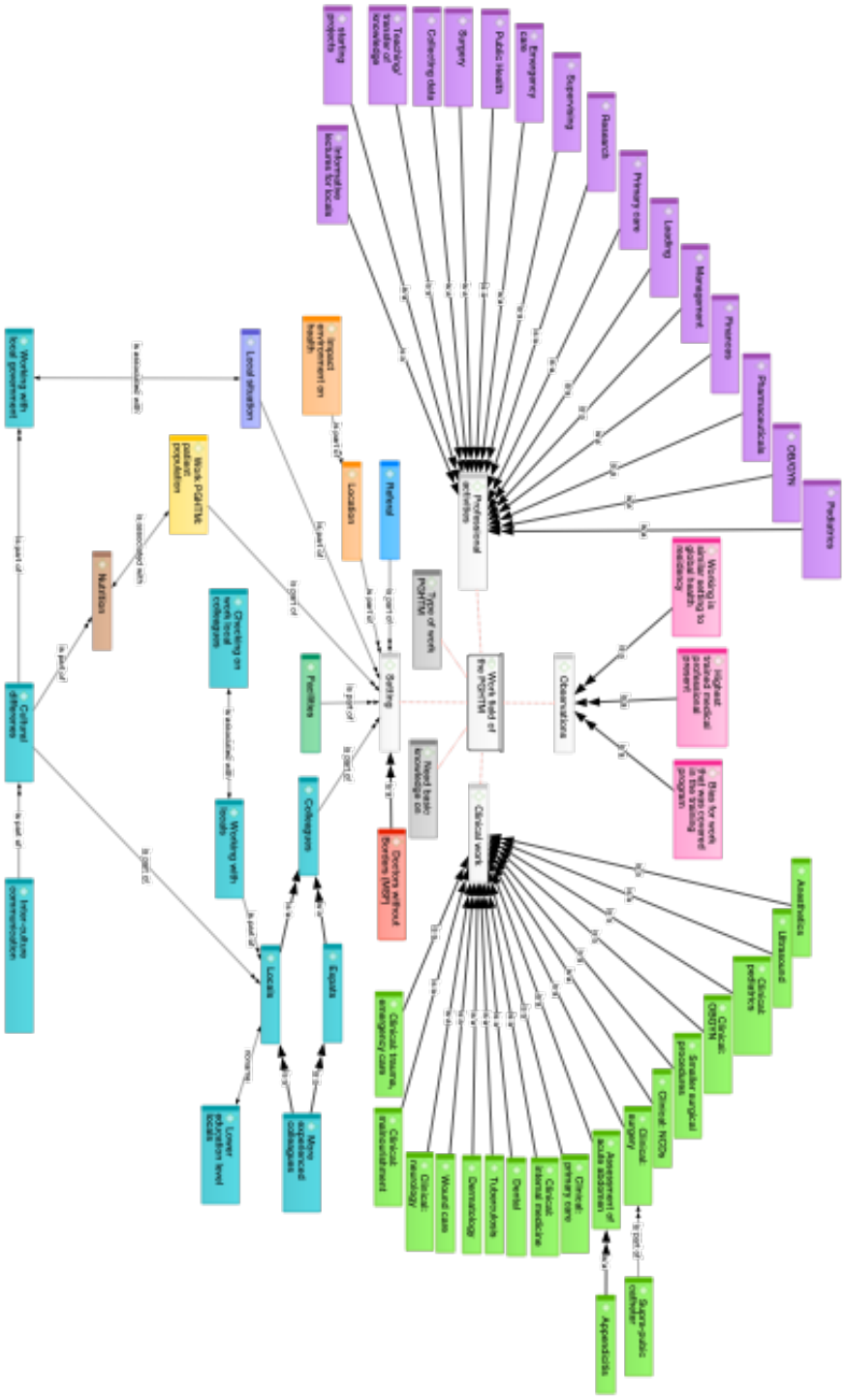
I: The Training Program



II: ‘The PGHTM’

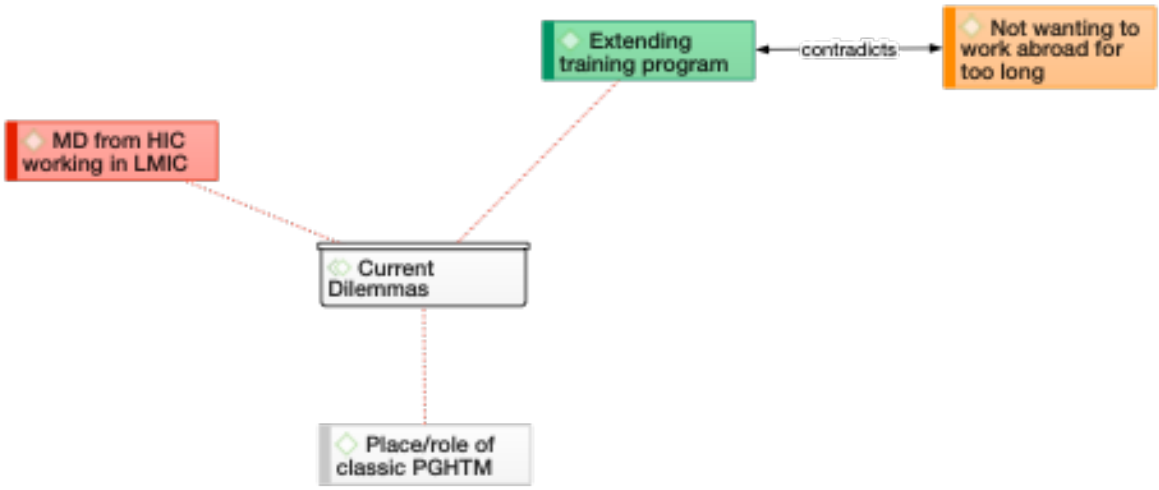

The PGHTM
Characteristics
Role PGHTM
Strength PG...
Different perspective
Flexible
Works independently
Takes on responsibility
Team worker
Reflects
Can prioritize
Handles stress well
Looks at situation calmly
Multitasks
Leader
Takes a macro perspective
Thinks logically
Inspiring
Improvises
Thinks about impact
working holistically
Just do it-attitude
Enthusiastic
Knows his limitations
First observe
Broad clinical mind
Wanting to give the best attainable health care
Adventurous
Assertive
Set of skills can be used anywhere
No perfectionists
Social Capital PGHTMs
Highest trained medical professional present
Role PGHTM dependent on setting
Bridge between the Netherlands and LMICs
The work has to suit you
You cannot help everyone
Not wanting to work alone at first
You get far with doing your best
is a
is part of

III: Work field of the PGHTM



IV: Challenges of PGHTMs

V: Current Dilemmas



## G. Waiver Research Ethics Committee

**RESEARCH ETHICS COMMITTEE**

Contact: Meta Willems (secretary REC)
Telephone +31 (0)20 568 8514
m.willems@kit.nl

To:
Isabelle Tiggelaar, Master student Medical Sciences VUmc, Intern CIGT
By email: isabelletiggelaar@gmail.com
Cc: Maaike Flinkenflögel,
<M.Flinkenflogel@kit.nl>

*Amsterdam, 13 April 2021*

**Subject** Decision Research Ethics Committee regarding a waiver for the " Learning Needs Assessment (LNA) of the training in Global Health and Tropical Medicine (GHTM) (S-150)"

Dear Isabelle Tiggelaar,

The Research Ethics of the Royal Tropical Institute (REC) has reviewed your application for a waiver for the "Learning Needs Assessment (LNA) of the training in Global Health and Tropical Medicine (GHTM) (S-150)" which was submitted on 30 March and resubmitted on 12 April 2021.

The study takes place in the Netherlands in the context of a masters study. The purpose of the study is to assess whether Dutch Physicians in Global Health and Tropical Medicine are adequately trained for working at global level with a focus on disadvantaged communities. The results will be used to inform the training programme. The study involves semi-structured interviews and FGDs with an estimated number of thirty participants, who will be selected with the help of the Concilium in Global Health and Tropical Medicine (CIGT). The study is exempted from full ethical review based on the following reasons:

a. the participants will be involved in their professional capacity only; the issues to be covered in the topic list cover information related to the duties of the respondents and information in the public domain; questions related to any personal questions are not included;
b. the participants will be asked informed consent before the data collection to make sure participation is voluntary and participants are informed that they can decide to decline or withdraw from the interview at any moment without any effect on reputation, or other consequences;
c. participating in this study does not foresee any physical, psychological and/or socio-economical risk or discomfort;
d. all information will be derived, processed, stored and published anonymously.

The Committee grants this waiver provided that you inform the KIT GDPR project officer about your research for GDPR monitoring purposes.

The Netherlands
Fax +31 (0)20 568 8444

ABN AMRO 40 50 05 970
ABN AMRO USD 62 62 48 183

The Committee requests you to inform the REC once substantive changes to the protocol are made, important changes to the research team take place or researchers are added to the research team.

Moreover, the Committee requests you to send the final report of the research containing a summary of the study's findings and conclusions to the Committee, for research monitoring purposes.

Please note that in case the final report is not submitted to the REC, or GDPR measurements are not taken care of sufficiently, this may have consequences for review of your next research proposal.

Wishing you success with the research,

Pam Baatsen
Chair of the KIT REC