# The emergency healthcare system of Arusha Tanzania

A study conducted by students from the University of Applied Sciences of Rotterdam in cooperation with the Lighthouse support foundation and Mount Meru Regional Referral Hospital

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## Acknowledgement

After staying in Arusha Tanzania for four months a few things became clear to us. The Tanzanian culture is in many points different than ours back home in the Netherlands. With many tribal backgrounds formed by old cultural believes, immigrants and influences from the different colonizers the society in Arusha is more diverse than we could ever expected. For our project we depended on the courtesy of the people of Arusha who showed us the way of life in and around the city. In this chapter we as a group would like to thank all the people who helped us developing a solution for the emergency healthcare system in Arusha. From the staff at Mount Meru Regional Referral Hospital (MMH) to the people of AMREF, Flying doctors, G1 Security Group Ltd. Ambulance service and everybody of the East African Health Platform. Without them we would not have succeeded in our quest of finding a solution to the problems we encountered. At last, we want to thank our local fixer, guide, landlord and project supervisor Ellen van de Velde of the Lighthouse support foundation for the opportunity to come to Arusha and for all the help during our stay here.

Asante sana for everything

# Preface

**Daan Schot (24)**

I am in my third year of Allied medical care provider, an education which allows me to work in or on the EMD, ICU, IVC and ambulance when I graduate. I have always had the dream to do my part of my education beyond the Dutch borders to see the difference in other countries and to learn from the way people are trained and work abroad. The minor Beyond Borders was the ultimate opportunity to start gaining experience abroad. And after consulting with the teachers lecturing this minor, we got the opportunity to work on a subject which was related to my own education. Therefore, I would get the chance to compare the Tanzanian healthcare system with the one I was used to back home.
After a few weeks of rotations on the emergency department (EMD) of the Mount Meru Hospital it became clear there were a lot of differences, the way of working, the mentality of the staff and the system in general. But also, the way patients handled their own physical wellbeing, the lack of knowledge of the patients was shocking to me. Regardless of the great effort made by the staff, the cultural boundaries along with the financial and logistical difficulties made it hard to make changes for the better. That's why I look back in a positive way to my time in Arusha because we made a big impact on a small group, hoping they will be the advocates to encourage the changing of lifestyle. Which hopefully will reduce the immense load of patients on the EMDs whose conditions are manageable with the means for hand here.
My time in Arusha surely contributed to my development towards a healthcare professional, maybe not in the way I was expecting but as I've learnt in here, not everything goes as expected.

**Holly Kampers (21)**

Hi, I am Holly and I am also in my third year of studying to be an Allied Medical Care Provider. The time I have spent in Arusha the last four months has opened my eyes to a whole new understanding of culture and how the healthcare system is systematically influenced by it. The attraction of studying abroad has always lingered in my mind and when the opportunity of doing my Bachelors' Minor in Arusha, Tanzania, arose I knew I had to go for it. The fact that our research question is based on urgent care made me even more excited to start the project since my Bachelors study is also all about emergency care and everything that has to do with it.
Completely indulging yourself in another culture and emergency healthcare system is something really interesting and also something energy-guzzling, but being able to compare Tanzanian and Dutch healthcare systems has been very intriguing. I am looking forward to taking my newly attained knowledge back with me to Rotterdam to then use this as a new tool to look at the current emergency healthcare system in the Netherlands from a new perspective.

I am proud of what we have done here in Arusha as a group, and how we have managed to really put something out there for at least six of the citizens of Arusha suffering from NCDs (non-communicable diseases). I hope our project can be the beginning of multiple other projects in Arusha concerning (emergency) healthcare.

**Martijn Kroondijk (20)**
Just like Daan and Holly I am a third-year Allied medical care provider student. As long as I can remember I have said that I wouldn't live my entire life in the Netherlands. So when the opportunity came along to go to Tanzania for this minor I immediately enlisted myself for this program. This program also gave me the opportunity to do my part in the quest to healthcare equality around the world.
Over the last few years I have worked in many different hospitals and different departments. Therefor I have seen many different workstyles, situations, patients and healthcare provides.

After the first day of rotations on the EMD of MMH it became clear that this would be a verry different experience. From this experience I have grown large amounts as an healthcare professional as well as a person.
Looking back at our time in Tanzania I am verry proud of what we have achieved working together with all of our different backgrounds an cultures. I hope the program will be continued for it will help many people.

**Anne Jonk (22)**
Mambo, I am Anne and I am in my last year of my bachelor's degree to become a nurse. The minor beyond borders brought me to an experience I will never forget. For me, the minor was my opportunity to study abroad, and I was curious about living in a different country. I am studying to become a nurse for almost seven years in different degrees. The cultural diversity of people have interested me from the beginning of my studies and I couldn't wait to learn more about a different culture/country. This project gave me the possibility to learn more about the healthcare system too and it was a once in a lifetime experience. I was able to compare the health care system of the Netherlands with the Tanzanian system and it gave me insight. The healthcare system in Tanzania is different and nothing like the western culture I am used to. For example, the people are mostly not aware of their health and sickness and there is not much attention about healthcare education. As a nurse In the Netherlands it is your job to make time for the patient to educate and tell them about their health situation and how to prevent.
The challenge we started was from a wide perspective and we had to make this challenge fit within the needs of the population in Arusha.
Because of al the people and stakeholders, we spoke to I got inspired to contribute in some way to help the people in Arusha. By asking the stakeholders and the residents what they were missing in the healthcare system.
Eventually we came up with a program. Wich was very successful due te perspective of the participants, they loved it. This made me realize, that even a small change or implementation can have a big impact.
Looking back at our time in Arusha we learned a lot about the country and the culture in Tanzania. And we can take this lifetime experience with us back home and hope there will be more small things like this, which are successful for the people in Arusha.

**Madelief Piet (24)**
Hallo, I am in my last year of the study Urban development to become a spatial developer. As a student I like to focus my work on climate resilience, co-creation and participation projects. For me this minor was my opportunity to carry out a project independently, in an unfamiliar environment. Everywhere, a city and its citizens have their own uniqueness. Where a good spatial developer can adapt to and create something useful that really benefits the people and does not expire in time. In my studies I never experienced a project that was fully focused on health care before. Although in urban designs I planned several hospitals and health clinics. Because they are an essential, even indispensable part of a good functioning city. As for me I like to believe that providing for healthy lifestyles contributes to a better functioning city. Previous work showed these can be stimulated by various factors. Like implementing health facilities, roads, public spaces and much more. Next to my experience in project, - process management that's where I saw my opportunity to work on this project. And so, this was recognizable because we've co-created with a health clinic located in Arusha. And made a pilot program for people with chronic hypertension. What I underestimated was the impact you have on every individual by working in the health sector. This is something I find beautiful and inspired me even more to do my job in the future. I am grateful for my experience in Arusha, Tanzania.

**Met opmerkingen [DS(1]:** Anne, Martijn en Madelief nog preface

# Introduction

‘’How to change the emergency healthcare system in Arusha Tanzania in order to reduce the number of deaths’’ was the question given at the start of this program. In doing this project, the sustainability of the solution would be a key factor since due to the intention that the solution would be continued by a local party.
The emergency healthcare system is as to be described in the next chapter very different than the system known to us in the Netherlands. The fact that healthcare insurance is obligated by law in the Netherlands and that only a small one-digit percentage of the Tanzanian population is insured, may resemble the major differences best. As told by the Medical Officer in Charge of the MMH, over half of the people who are registered dead in the hospital had already passed when they were brought in. This is due to poor and expensive pre-hospital care by private ambulance services and many other problems described later in this report.
To acquire a good impression of the workings of the emergency healthcare system in Arusha a rotation of four weeks at the Emergency Department (EMD) of MMH was conducted. This made it possible to get in touch with professionals and to work alongside them. MMH is the biggest governmental hospital in the city of Arusha and therefore treats people from different layers of the community. From 'boda boda' (local motorcycle taxis) drivers to patients with untreated non communicable diseases (NCD’s) like diabetes and chronic hypertension, who together represent most patients getting treated in the emergency healthcare system.
Especially the patients with untreated NCD’s form a big problem for local EMD’s like the one of MMH. Due to financial, logistical, and cultural obstructions the people from the region of Arusha struggle to take control of their glucose or blood pressure levels. Therefore, they develop comorbidities like strokes, pneumonias, and renal failure. The healthcare system back in the Netherlands rarely sees cases like this, because there lays a big focus on preventing and managing NCD’s.
The aim to provide new insights with the knowledge of the system in the Netherlands, to the local community on how to live with their NCD’s and prevent them from ending up on a EMD stroked out because they didn’t know how to cope with a chronic high blood pressure.

# Research methodology

To define a problem to address for improving the emergency healthcare system two types of research were conducted, qualitative research in the form of interviews and quantitative research with the help of literature. After finishing both types of research, both researched are compared to define a problem to address and to form a solution for.

## Qualitative research

**Mount Meru Hospital**
The biggest source of information was MMH, where the staff was observed and interviewed about the process on the EMD.
During one of the first days, a junior doctor on the EMD talked about the biggest challenges he faces as a doctor in Arusha. He talked about the fact that even he as a man from the Maasai tribe couldn't convince the people from his village to visit a doctor. The cultural beliefs are so imbedded in their way of living that even family members can't convince them to consult modern medicine. This was also accordance with the observations on the EMD. People from tribes like the Maasai coming in when they were on the verge of death.
This was also confirmed by the nurses during our stay at MMH.

***Ann of Holls aanvullen interview Yvonne***
***Interview van paasa er nog bij <<<***

After becoming acquainted with the medical manager of the EMD he discussed the current situation on the EMD. He addressed the problems concerning staffing on the department. In his opinion there aren't enough doctors and nurses to cover all the shifts. This results in long waiting times for the patients and a slow process on the EMD. The fact that there also isn't enough equipment to threat the patients with, is also an important point on where the EMD should improve on in his opinion. The equipment that is present on the department is not working properly most of the time or must be shared among patients. The biggest challenge ahead to develop the EMD was the knowledge and training of the staff according to the medical manager of the EMD. He said that majority of the staff wasn't trained well enough to use all the equipment on the EMD. His opinion on this is shared by the Medical Officer in Charge (MOiC) of the MMH doctor Alex Ernest. The medical director is trying to develop a new course for nurses to follow. Because at the moment none of the staff on the EMD qualify to enroll in a master's study in emergency or critical care. The renewal of the EMD department was in his opinion a big step towards modernizing the service to be provided in the department. After being asked what the biggest constraint was in having a good prehospital system in the emergency healthcare chain, the medical manager pointed at the non-conducive way patients were transported to the EMD. According to last year's numbers over half of the patients that were registered dead were already diseased when they arrived at the hospital. This due to transporting patients on boda boda's and in tuk tuks instead of ambulances with trained staff.

**Medical transport services**
The private ambulance sector in Tanzania is too expensive for most of the population and therefore only being used by the wealthiest group of Tanzanians. The lack of general awareness, knowledge about sickness and when to consult a doctor is another big reason for the large number of diseased arrivals at MMH. Due to cultural believes at tribes like the maasai people often don't want to refer to modern medicine and rely on herb potions and other alternative medicine. Only when these treatments don't work, they bring their relatives to the hospital in the hope doctors can prevent the unavoidable.
The problem with the private ambulance sector was also explained with our meeting with mister Hassan the director of the Arusha branch from G1 security group Ltd who provides an ambulance service. His service only charges compensation for the gasoline expenses made

at long trips to the airport or other cities like Dodoma or Dar es Salaam. After having an almost tragic experience with the private ambulance services inside his family the security company decided to set up an ambulance service of its own to prevent such events from happening. According to mister Hassan it is important to put patient care first instead of making money, something completely logical in the Western countries but not in Tanzania unfortunately.
Besides ambulance services by road there are also companies who provide healthcare service in the air. Due to the long distances people must travel towards hospitals when staying in the national parks' companies like AMREF and Flying doctors provide different subscriptions for their services, which can go from medical evacuations out of remote areas to repatriation to countries of residence. Their service is relatively cheap compared to the costs of a single flight but here the same problems are faced as with normal insurance. Only a few real locals make use of their services as they mostly have tourists that close of insurances for their safaris or mountain expeditions.

After talking to different stakeholders, the following statements were formed;

- The local community is suffering a lot from chronic illnesses like hypertension and diabetes due to physical inactivity, poor diet, and excessive alcohol abuse.
- Healthcare is a school subject, but teachers are not comfortable giving the classes. Therefore, children are not educated about following a healthy lifestyle to prevent chronic illnesses as mentioned above.
- The local community prioritizes other things over their own health. Because of cultural, financial, and logistical reasons they fail to follow up on check-ups and medication. They are also not aware of the fact that their own mental and physical wellbeing is their own responsibility. Because of this prioritizes they don't see the priority of health insurance.
- Hospitals are understaffed, which leads to a lack of time for doctors to educate patients about the importance of changing their lifestyle and being dedicated to that change.

To prevent the patient group with NCDs from coming to the EMD education has to be seen as the key factor in the process of change. Due to the large number of tribes in Africa there is a lot of misconceptions about healthcare. Cause the education of modern medicine is lacking or absent in these tribes' people are not aware about the risk factors and ways of treatment for diseases they're at risk for. Even in non-tribal communities where healthcare is a subject in school, the transfer of knowledge is lacking. Due to the absence of knowledge and confidence by teachers to lecture about the subject.

## Defining the problem and focus group

On the EMD of MMH patients of different ages, tribal backgrounds and races present themselves. The problems they present themselves with can be divided into one of the following categories: patients suffering from NCDs with the comorbidities they developed due to lack of treatment and self-care and patients with injuries related to traffic accidents.

Boda boda drivers, their passengers, and pedestrians that are hit are regulars on the EMD. As described in our research methodology and driving under the influence of alcohol is a big problem in the northern part of Tanzania (EL-Gabri et al., 2020). In that same research of El-Gabri et al. (2020) about drink-driving in Moshi a city 80km east of Arusha the normalization of drink-driving in the commercial transport industry was discussed. In a meeting with victims of alcohol related traffic incidents, their families and community advisory boards was ''*drinking is ingrained in boda boda driving''* mentioned as an important statement in solving drink-driving to prevent traffic accidents.
''*Police enforcement on drink-driving is necessary''* was another important statement made during the meeting. Alcohol controls performed by local law enforcement are rare to see while there are clearly enough people driving around who drink enough to have their license taken according to Dutch traffic regulations. To stay close to our education in healthcare the decision was made not to address this problem any further because this would lead to a solution closer related to an education in integral safety science.

After excluding the patient group mentioned in the previous paragraph the patients with NCDs remained. During the interviews conducted with different staff members of the MMH this also seemed to be the patient population where there was a lot to improve. The education of the local community about NCDs leaves much to be desired. People seem according to the staff on the EMD no to understand the meaning of the word chronical. That finishing one prescription of medication is not going to be enough to control your high blood pressure for the rest of your life.

The current healthcare system in Tanzania is not conducive for the situation. People often travel for hours to hospitals like MMH out of remote areas. There is an insufficient number of general practitioners that can provide care for the minor problems people encounter. The mentality that being ill is a weakness and that you are not allowed to feel pain leads to the fact that people often only visit the hospital when they can't walk, eat, or talk. In most cases they've develop a comorbidity that is way harder to treat with the means beforehand and most of the time unaffordable for people of the local community. Their manageable chronic hypertension or diabetes then got the better of them and changed their lives for good.

Chronic hypertension and diabetes type two have the greatest incidence among patients on the EMD. As a result of an unhealthy diet, alcohol abuse and physical inactivity these diseases occur in many patients lives (Edward et al., 2000).

The treatment for diabetes consists of checking the glucose level multiple times a day and to keep it under control with change of lifestyle and insulin. Something that with the knowledge about the lifestyle of most of the population is not going to be easy. The lifestyle and habits of the average Tanzanian would not be adjusted easy to a NCD friendly one. Next to that the costs and logistical problems maybe even form a bigger problem than the Tanzanian lifestyle. Storing insulin in a cool place would be a big challenge with the poor power supply to big parts of the city, not even talking about the parts outside the city. Working in a sterile way is a challenge inside the hospital and therefore not to be trusted to the local community. Metformin and other oral medication for diabetic patients seem to be less effective on the long term when it comes to preventing comorbidities, which are almost standard witch patients on the EMD and would therefore not be of good use as well (Fal, Jankowska, Unchmanowicz, Sen, Panaszek & Polanski. 2010).

On the other hand, chronic hypertension is presumably easy to regulate. According to the Dutch Family Practitioners society (2016) patients only need to measure their blood pressure every two to four weeks, this can be done at home or at the general practitioners' office. A blood pressure cuff is easy to clean and will therefore presumably not contribute to a greater infection risk like the needles of the diabetic patients are able to. The treatment of chronic hypertension happens through diuretics, betablockers, ACE-inhibitors and calcium antagonists, all tablets with relatively low costs around $336 dollar annually (Park, Wang, Fang, Durthaler & Ayala. 2020). The costs of medication of African countries are much lower due to fixed prices with countries that sell medications is big numbers like India and China (van de Velde, 2022). Tablets don't have to be stored in the fridge, don't have to be injected with needles and are therefore safer and a of better use in Tanzania.

The hospital and mostly the EMD is struggling with staffing problems. There are not enough doctors (in their perspective) to cover every shift according to the medical manager of the EMD. He also addresses that the nursing staff that is working on the EMD isn't qualified enough to work on a specialized department like the EMD. Due to the lack of a suitable specialized course and that they aren't qualified to enroll in the masters studies of critical care or emergency care according to the Medical Officer in Charge and the department head of the EMD. Even though there are six spots for nurses in the master programs the MOiC doesn't let them enroll. Due to the lack of (specialized) staff, equipment, and the knowledge how to use it, there is not enough capacity to threat the large amount NCD's patients with the comorbidities acquired. By treating this group of patients in an early stage outside the hospital the the load on EMDs will be reduced. So that the staff present can take care of the EMD can take care for patients who come into the EMD that don't have manageable NCD's.

With the knowledge that the treatment of chronic hypertension is more sustainable and feasible in Arusha, the focus will be put on patients at risk or already suffering from chronic hypertension.

With the motivation and decisions stated above a focus group was formed with the following characteristics;

- The focus group should consist of members of the local community
- They are lacking knowledge about NCDs, how to prevent, obtain and treat them.
- They don't have the knowledge, facilities or financial needs to change their lifestyle

## Quantitative research

Hypertension is a very common condition that a great number of people all over the world suffer from. The heart pumps the blood in the blood vessels by contracting with every heartbeat and releasing right afterwards (*Hypertensie | UMC Groningen*, n.d.). This is responsible for a certain pressure in the blood vessels: the blood pressure. The so-called systolic blood pressure indicates the pressure that originates when the heart contracts and the diastolic blood pressure is the pressure that forms when the heart relaxes its muscles. The blood pressure is expressed in mmHg and with an elevated blood pressure, the systolic blood pressure is higher than 140 mmHg and the diastolic blood pressure higher than 90 mmHg.

Hypertension is a big issue in both rural and urban areas of Tanzania.
As found in research from Galson et al., 2017, where 481 random Northern-Tanzanian adults were examined, 28% of these citizens suffered from hypertension. Almost half of these patients were aware of their diagnosis (48.3%) and almost everyone (95.3%) was not under supervision by a medical professional. Another reason for the immensity of this condition is the fact that patients report their own medical histories, resulting in a lot of medically important facts lacking from patients' medical files.

With all of this said, it is important to keep in mind the fact that a lot of hypertension cases in Northern-Tanzania are not reported at all, due to a great number of citizens not being able to afford medical services.

There are several factors that can cause hypertension. Big risk factors for (chronic) hypertension are an age above sixty years old, alcohol abuse (a study from Philips et al., from 2022 showed that every alcoholic drink a day was significantly associated with a higher systolic and diastolic blood pressure), a high body-mass-index (BMI), a higher waist:hip ratio, physical inactivity, smoking, a poor diet, obesity, and diabetes (Edwards et al., 2000). There are also a couple of 'barriers' that stand in the way of optimal care being offered; the *point-of-care* communication between caregivers and patients is not considered to be efficient, besides the fact that the Northern-Tanzanians' general knowledge about hypertension is known to be substantially low and the difference in individual knowledge about chronic diseases significantly big (Galson et al., 2017).

The burden that hypertension causes the citizens of Northern Tanzania is substantial. Since optimal control over one's hypertension is scarce, transdisciplinary strategies for local practices will need to be researched further to facilitate early diagnoses and sustainable delivery of care (Galson et al., 2017).

## Field research

Met opmerkingen [DS(2)]: tot hier zijn alle WEs er uit gehaald

After defining our target group, we tried to empathize with patients in Arusha and surrounding areas. To find solutions to improve their health we needed to discover certain problems in the process of reducing (chronic) hypertension. For our field research we went to Mount Meru Regional Referral Hospital to experience what the outdoor department for hypertension on Tuesdays holds, to be able to see the patients' paths through the department, attend several medical consultations and ask about the average profile of someone with (chronic) hypertension. And talked to the front office manager and a medical doctor about their work experiences. They said cultural habits and lifestyle are the main cause of the large number of people with (chronic) hypertension. Also, these things are hard to change. Most of the patients don't feel responsibility for taking control of their own health and just take medicine to lower the complaints. They keep coming back...

To look for patients in different settings we have visited two other health clinics in Arusha. One is called 'Mwanama' located in the neighborhood Kijenge. This is a relatively small health clinic where only residents go for check-ups. There we conducted an interview with a seventeen-year-old girl who has been having chronic hypertension for two years. She told us that she's only taking medicine (if there is enough money to provide for it) when she doesn't feel right. Further she didn't know anything about hypertension at all. Or what lifestyle changing can do for her. Except that her mom also suffers from it. The advice a previous doctor gave her was to drink more water. Nothing else.
The second health clinic we visited is the East African Health Platform (EAHP) an organization in east African (Tanzania, Kenya, South-Sudan, Uganda and Burundi) which brings governments and health organizations together. They are organizing projects focused on people with a low social network/income which can't be helped with the current system. Because of our same goal and interest in each other we decided to make another appointment to see if we could work together.

We did desk research about worldwide reduction successes, incidence of races and cultural diversity among the population in Arusha. According to literature and an appointment with a lifestyle specialist from Belgium, outreach programs are great success factors. In this meeting she gave several examples on how to adjust people's lifestyle for contributing to improving cultural habits. Especially for spreading awareness in providing information about

Met opmerkingen [A(3)]: Acoording to an lifestyle coach outreach programs are..

lifestyles and doing check-ups. Also, we've found that the average lifestyle of citizens in Tanzania is a big cause for the large number of people with (chronic) hypertension. Mostly because of cultural habits. This correspondents with earlier research to create outreach programs for creating awareness.

**Met opmerkingen [A(4]:** dit stukje verplaatsen naar boven?

## Differences compared to the Netherlands

As addressed in the introduction of this report are the major differences between the Netherlands and Tanzania regarding the healthcare system best displayed by the obligated healthcare insurance in the Netherlands and the low percentage of insured Tanzanians. The differences will be described in the three following categories, prehospital care, in hospital care and finances.

### Prehospital care

In Tanzania there is no organized ambulance service, it consists of private ambulance services and ambulances connected to hospitals and other healthcare facilities. This distribution of services leads to an unorganized structure on which the local community can't rely. Therefore, the local community relies on alternative transport to hospitals in times of need. According to members of the MMH to most of the patients get brought to the hospital by boda boda, tuktuk or private cars. This leads to worsening of the patient's condition. A city, region or even nationwide ambulance network as known in the Netherlands could prevent these situations. By centralizing ambulance care the level of care will also be the same for everybody in need of an ambulance. Maybe the most important facet in this is that also financial differences between different ambulance care providers will be terminated by the deprivatization of the ambulance services.

### In hospital care

Without an organized first line of healthcare, consisting of general practitioners and practice nurses, most of the patients come directly to the hospital. Therefore, the waiting room of the EMD is filled with various types of patients, from minor issues to serious and life-threatening diseases. Doctors therefore see many patients on the EMD that are not supposed to be treated there. This results in long waiting times where people eventually leave without being consulted by a doctor. Realizing a better deviation of healthcare based on the urgency of care like the system in the Netherlands, could relieve pressure on the EMD by taking away those minor injuries. As to be described in the next paragraph, the financial part also leads to a different system inside the hospital. Where everything from the service of staff, materials, and additional research must be paid up front. Split up in different desks where one first pays for the materials asked for by the doctor before collecting them at the pharmacy in the hospital. This process is all but beneficial for the wellbeing of the patient and the process on the EMD in general.

### Finances

As mentioned in the introduction of this report, the best way to describe the difference between the healthcare systems of Tanzania and the Netherlands is the healthcare insurance. Comparing the 95<% people in the Netherlands with a healthcare insurance to the <10% in Tanzania. This is caused due an obligation by law in the Netherlands and a more difficult financial situation in Tanzania. Where people in Tanzania prioritize other things over a health insurance like primary needs as food and housing. Only when employed in a government run organization people and their family get a healthcare insurance. Obligating a healthcare insurance has proven to be difficult in other countries and would also be challenging in Tanzania. But to equal the differences between insured and uninsured citizens out this will prove to be essential. Giving everybody the same change of receiving the (emergency) healthcare they need.

## Finding a solution

After defining the problem there are three topics that, when combined, can have a big impact on the local community. By combining education, the promoting of physical activity and delivering check-ups in a program which takes place on a regular basis we hope to motivate and mobilize the people of the local community. Having local authorities, healthcare facilities like hospitals and clinics and fitness coaches work together, is key to make this program a success. By addressing the following points, we want to form the following program:

- Having a program on a regular basis, at least once a month.
- Having local healthcare facilities working together by providing medical staff to educate people and to perform check-ups on site.

Implementing a program like this is our focus point on how to reduce chronic hypertension among the population in Arusha. Our target group are people who don't have the knowledge and/or facilities to change their lifestyle. For both people who are vulnerable to, and patients who are suffering from (chronic) hypertension. As it says on the World Health Organization website, the biggest goal is to prevent chronic hypertension. But if the disease has already been diagnosed, the most effective low-cost measures are therapy and medicine.

As we concluded in our research, the biggest problem is not providing medicine (although financing medicine for patients can be difficult because of the costs) but changing the lifestyle of the patient, as well as for patients in the future. With this program our goal is to spread awareness about (chronic) hypertension and to point out everyone is responsible for their own well-being and health. Whitin the program we will provide education about how to prevent - and lower blood pressure while having (chronic) hypertension by changing lifestyle patterns through physical activity, maintaining a healthy diet, and lowering alcohol usage. But also, to provide more check-ups, and increase awareness within every individual about measuring their blood pressure. The available sports activities will stimulate taking immediate control of their own well-being and health. Hopefully this will contribute to the weekly activities and change people's lifestyles.

All this will hopefully reduce pressure in health clinics and hospitals (the emergency department in particular) and the costs for health insurance and provide a healthier and longer lifespan for the population of Arusha.

Therefore, we started working with EAHP, providing physical activity and regular check-ups for people who suffer from hypertension. Since good dietary habits can also reduce hypertension (Mtabaji et al., 1990), we provided an after-work out snack containing healthy nutrients; a so-called *energy booster.*

## Solution

Due to the lack of education in schools and elsewhere the basic knowledge about health is very minimal. Word of mouth communication often is the only source of information for residents of Arusha. Treatment with medication, therapy or coaching is not achievable for most of the local population due to financial or logistical reasons. The facilities currently offered by the hospital are too expensive for most households in the long term.
At the end of the program, we strive for more awareness, health, fitness, joy of life and a change in lifestyle. Furthermore, we hope that they will inspire their community to do the same.

## Resources

**Met opmerkingen [A(5]:** uitschrijven in zinnen

To duplicate this program resources, both humanitarians and materialistic are needed.

Humanitarian resources needed are a fitness coach, doctor, nurse and a program coordinator.

Materialistic resources needed are a blood pressure machine, glucose machine, very basic sport equipment, food and a place for sports and checkups.

There are just a few resources needed to enroll in this program. For this reason, the program is not expensive to start or maintain. For the food there is an option. The food can be either provided by the organization or by the clients themselves. When clients bring their own food, the doctor can see what the clients bring and usually eat. The doctor then can determine if it is healthy enough and give them feedback on what they eat. It also saves the organization money. When the organization provides the food, you know for certain that it is healthy, and it is an extra service you provide for the client.

## Program

As motioned earlier the program consists of a period of six weeks, four days a week, approximately three hours per session. When these moments are scheduled is flexible. It is possible to do it early in the morning, midday, or evenings; it is most important that it suits the timetable of the clients.

During the first session a baseline will be determent. The doctor will fill in an intake form, which can be found in the attachment, and the fitness coach we do a baseline fitness test. These baseline tests will be repeated during the first session of the third week, to see the progress and if needed make some changes and during the last session of the sixth week the tests will be repeated to determine the overall progress.

Regular sessions are built up out of four blocks: checkup, sport, education and eating.

A schedule for a regular session could look like the following.

| Time | Activity | Responsible |
|---|---|---|
| **10:00-10:30** | Arrival of clients and checkups. | Nurse and coordinator |
| **10:30-11:30** | Physical fitness session | Fitness coach |
| **11:30-12:30** | Food/ drinks and refreshment during medical lesson | Coordinator and nurse/ doctor |
| **12:30-13:00** | Extra time in case something takes longer and saying goodbye/ going home | Coordinator |

## Responsibilities

There are four professionals needed for this program and they all have their specific roles. The roles of these professionals are defined as follows:

Coordinator: the coordinator is responsible for the overall program. The coordinator must make sure the other professionals do their jobs and makes sure the materials are in order when needed. Furthermore, the coordinator takes care of the mental aspect of the clients together with the other professionals. The coordinator makes sure the clients show up and help clients with any struggles.

Fitness coach: The fitness coach is obviously responsible for the fitness side of things. The coach makes sure all clients can do exercises at their own level. It is important to motivate the clients and prepare sessions well.

Nurse: The nurse does the checkups and monitors how clients are doing mentally together with the other professionals. Furthermore, the nurse does the medical talks as well as keeping an eye on what the clients are eating to assist the doctor.

**Met opmerkingen [A(6]:** measures the vitals?

**Met opmerkingen [H(7]:** The nurse, the nurse, the nurse; even mooi uitschrijven ipv zo opnoemen

Doctor: The doctor is responsible for the medical and food side of things. The doctor does the three baseline and progression tests and changes the plan for a client based on the result. The doctor makes sure that what the clients are eating is healthy. The doctor is also responsible for the medical talk and does this together with the nurse.

# Discussion

## Results

The collaboration has led to a successful pilot for six participants of whom four suffer from Chronic Hypertension and two from Diabetes Mellitus. The program was evaluated with every patient after three weeks of attending the program. In these evaluations there was talked about their thoughts about the program and their experiences, as well as the impact it might have had on their health. The results of the program according to the patients were very positive and the patients are happy that they finally feel heard by the doctor and fitness coach, who are willing to specialize treatment for every individual. After evaluating the first period of sixteen days, patients addressed that they are already seeing progress in both their physical and mental health. They feel more energized in their daily activities and the sense of togetherness in the program contributes to this. After the first sixteen days all patients were still showing up four times a week. This is a showing of the willingness to change their lifestyle for the better. People are interested and eager to learn about a better way of life, hopefully they can advocate this lifestyle for others in their social circles.
The vitals that are monitored at every visit to the program show, according to the doctor, that there are already small improvements visible.

## Limitations

The participation of the six patients to the program is free for a period of six weeks. In response to a conversation with the chief of the organization it seems the participants will have to pay contribution after these six weeks just like new patients that will enroll in the program.
The budget prepared by the platform was an excessive amount. After discussing this with the CEO, there was concluded that the durability of the program is not likely to be guaranteed by the platform. With this in consideration the spending limitations of the patients enrolling in the program, who would be covering for major purchases like laptops and overpriced services.
Unfortunately, the platform what developed the program with had more business orientated plans than had hoped. Turning a program that was set up with the patient's wellbeing at best interest was becoming a business model. After some success they immediately wanted to create an unrealistically big program and had no reasonable expectations about the progress of the program. They forgot about the importance of the clients, to help the people who can't afford treatment.

## Conclusion

"How to change the emergency healthcare system in Arusha Tanzania in order to reduce the number of deaths".
With the program been successful as proven during the pilot and can hopefully be continued by another organization which is less business orientated. Matching the intentions while setting up this program, with the wellbeing of the people of Arusha at best interest.
The patients were educated to become more aware of their health. Because of the organization they could help these six participants and educate them with information to improve their health issues. Raising awareness under the population of Arusha is a key factor to reduce the pressure on local EMD's and to reduce preventable comorbidities, early mortalities and the number of deaths.

### Recommendation

The next group from the University of Applied science of Rotterdam should continue to raise awareness of chronic illnesses amongst the population of Arusha. Here by alsow for the organizations they should continue with creating awareness of chronic illnesses amongst the population of Arusha. To unload the EMD and create awareness. By creating more

awareness of consequences of chronic illnesses and making sure these consequences are repeated constantly, people will become unconsciously conscious of them. This can improve the awareness, as told in an interview we had with a lifestyle coach from Belgium.

Recommendation for further research:

- Doing research about creating commercials for people with chronic illnesses like hypertension and diabetics.
- Providing information to important people within communities
- Starting to create awareness about the importance of awareness programs within different organizations

Our advice for the organizations will be to create more awareness in every certain way by repeating the importance, true commercials, show people a fitting healthy lifestyle, mouth to mouth conversations and flyers/folders then it will be most effective.
We would like to advise organizations involved in changing the wellbeing of Tanzanians to focus on education. By raising awareness among the public about prevention and the treatment of NCD's the next big pandemic can hopefully be avoided.
Our advice for the parties continuing this program is as follows:

- Working together with local organizations requires clear communication from the start. Discuss your expectations, responsibilities and desires at the start of your collaboration to get everybody in the same direction.
- To prepare a financial plan in which the responsibilities of all the parties involved are stated clearly is essential.
- To focus on education, the involvement of professionals that are comfortable in and competent of providing information about NCDs and lifestyle change is key.

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