Medical Checks for Children

# Medical Report
# Tanzania Mikocheni 2016

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**Introduction:**
In the fourth week of August 2016 Medical Checks for Children (MCC) visited several villages in the North of Tanzania for the eighth time. The MCC team checked 713 children of Mikocheni and if needed, treated them free of charge. The medical camp was organized for six days from the 27th August to the 1st of September.

The MCC team consisted of ten members from The Netherlands: Eryn Liem (medical manager and mission leader, pediatrician), Iris van de Gevel (logistics manager, toxicologist), Femke Groenveld (emergency physician), Naomi Petersen (resident emergency medicine), Larissa Mous (resident family medicine), Anneke Boekema (general practitioner), Nel Mocking (mediator), Janke Groenveld (executive secretary) and Hedwig Gosselink (education advisor).

The medical checks were organized in close cooperation with NGO FT Kilimanjaro with the aim to improve general health of the community of Mikocheni.
The village Mikocheni is located in the Kilimanjaro Region of Northern Tanzania. The nearest hospital is Tanganyika Planting Company (TPC) hospital, approximately 15-20 km from Mikocheni.
Technical equipment, medical supplies and toothbrushes were brought from the Netherlands by MCC team members. Most of the medication was ordered by Gerbert. Soap for every child was purchased from local shops in Moshi.

The cooperation of FT Kilimanjaro (FTK) (in person of Gerbert Rieks, Harry Mwerinde, Eunice Mollel and Stella Mserikia) consisted of the following (amongst others):

- Education and selection of translators/local helpers.
- Providing board and lodging of all MCC team members.
- Transportation of the MCC team from Kilimanjaro airport to TPC and transportation to the check locations.
- Announcement of the medical camp in the villages.
- Making copies of all necessary papers.
- Giving support in ordering and delivery of medication.
- Giving all kinds of support to the MCC team during the medical camp.
- Bringing children to TPC hospital.
- Providing follow-up for the children referred to KCMC and CCBRT.

**Medical Checks for Children on location:**
The medical checks were performed in six days in three sub villages: Mikocheni Ndogo, Mikocheni Kubwa (including Masaini), Kirungu and Samanga. Children were checked according to the MCC 'carousel':

1. Registration of the child
2. Measuring height and weight
3. Blood test (hemoglobin (Hb)) and if indicated an urine test and/or malaria test
4. History and physical examination by a medical doctor
5. Providing medication (pharmacy)
6. HIV/AIDS counseling
7. Education on tooth brushing, hand hygiene, and nutrition. A toothbrush, soap and tooth paste was given to each child.

Special attention was given to the transfer of part of the medical carousel to FTK team members. Stations 1, 2, 6 and 7 were completely performed by FTK team members, and were only supported incidentally by MCC team members. The station of the Hb measurement, was transferred to FTK team members throughout the week.

At the doctor's station, the MCC doctors were accompanied by two Tanzanian doctors. The Tanzanian doctors were partly working as translators for the MCC doctors, but were also working completely independently. In order to facilitate the process of cooperation, the MCC codes for diagnosis and treatment were translated in Kiswahili.
For assistance and general knowledge of the population, the 3 Home Based Care workers (HBCs) were present during the medical camp, serving in several roles (e.g. plasters, registration), and more specifically for children referred to the hospital or a social program. The 3 village managers also played an important role in referring the children to the hospital and for all required follow-up actions.
At the education post, 2 interns from the Netherlands and a Tanzanian school teacher were training the children on tooth brushing and nutritious food.

Overall the composition of the MCC and FTK teams during the medical camp was as follows:

| Station | MCC | FTK | |
|---|---|---|---|
| | | workers | Translators |
| Coordination/computer | 1 | 1 | |
| Registration | 0 | 3 | |
| Measuring height/weight | 0 | 3 | |
| Blood test | 1 | 1 | 2 |
| Doctor's examination | 5 | 2 | 3 |
| Pharmacy | 2 | 0 | 2 |
| HIV/AIDs counseling | 0 | 1 | |
| Education | 0 | 3 | |
| Disabled children | 0 | 1 | |
| Tea/coffee | 0 | 1 | |
| Total | 9 | | |

The cooperation between MCC and FTK workers worked great. All stations flowed as usual, and FTK workers were quickly trained for their jobs.

At each station, and especially at physical examination and pharmacy station, education was given to the children and their care takers on good nutrition and hygiene.
The MCC team paid special attention to the prevalence, treatment and prevention of anemia, growth abnormalities, worm infections and HIV/Aids.
In addition to the information given to the parents during the medical camp, a special training was given to the Community Health Workers.
HIV counseling was given to all caretakers (on a voluntary basis), but unfortunately due to a shortage of HIV tests in Tanzania, a HIV test could only be offered if HIV was suspected. Furthermore, if suspected, a malaria test could be performed on the spot.

medical checks for children

**Results Mikocheni**

In Mikocheni, we saw 713 children in total. For Mikocheni Ndogo it was the fourth medical camp, for Mikocheni Kubwa and Kirungu it was the third medical camp and for Samanga it was the first.
Of all children, 41% had also attended the medical camp in 2015 (i.e. the registration notes of these children from 2015 were found). Considering the number of re-visits in the last years, we think this is an underestimation.
Special attention was paid to the presence of caretakers during the medical camp, at the announcement of the medical camp and at registration. Almost all children (665, 91%) brought a caretaker; 38, 5% came with a teacher). We are very pleased with this high attendance of caretakers, as an important part of the medical camp is the transfer and exchange of medical and healthcare information. We know that the presence of caretakers will make the medical camp more sustainable. Therefore, we stress that in the coming years, equal attention should be paid to the presence of the children's caretakers. This especially holds true for Kirungu and Samanga, where many school classes came with teachers, instead of care takers.

**Table 1: Number of checked children per day and geographical location**

| | 27-08-16 | 28-08-16 | 29-08-16 | 30-08-16 | 31-08-16 | 01-09-16 | Total |
|---|---|---|---|---|---|---|---|
| Kirungu | 0 | 1 | 1 | 140 | 0 | 1 | 143 |
| Masaini | 1 | 15 | 44 | 0 | 0 | 0 | 60 |
| Mikocheni Kubwa | 102 | 115 | 72 | 1 | 0 | 1 | 291 |
| Mikocheni Ndogo | 0 | 0 | 0 | 0 | 1 | 135 | 136 |
| Samanga | 0 | 0 | 0 | 0 | 82 | 1 | 83 |
| **Total** | **103** | **131** | **117** | **141** | **83** | **138** | **713** |

In general it can be stated that most of the children from Masaini are Masai. However, many children from the other villages might also be Masai. As we expected some differences in malnutrition and anemia according to tribe, we performed separate analyses according to tribe (Masai or non-Masai). In total we registered 238 children as being Masai).
Less children from Mikocheni Kubwa attended the medical camp when compared to last year (total 418 in 2015). For the other villages the numbers were comparable.

**Table 2: Summary of checked children per geographical location, age and gender**

| | Total | | Kirungu | | Masaini | | Mikocheni Kubwa | | Mikocheni Ndogo | | Samanga | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 713 | | Total=143 | | Total=60 | | Total=291 | | Total=136 | | Total=83 | |
| **Age** | **N** | **%** | **N** | **%** | **n** | **%** | **n** | **%** | **N** | **%** | **N** | **%** |
| <=1 year | 137 | 19% | 22 | 15% | 9 | 15% | 58 | 20% | 27 | 20% | 27 | 20% |
| >1 en <5 years | 217 | 30% | 36 | 25% | 22 | 37% | 88 | 30% | 39 | 29% | 39 | 29% |
| <5 years | 345 | 48% | 58 | 41% | 30 | 50% | 138 | 47% | 66 | 49% | 66 | 49% |
| >=5 en <=10 years | 335 | 47% | 77 | 54% | 27 | 45% | 135 | 46% | 67 | 49% | 67 | 49% |
| >10 years | 34 | 5% | 8 | 6% | 4 | 7% | 18 | 6% | 3 | 2% | 3 | 2% |
| Gender | | | | | | | | | | | | |
| Boy | 328 | 46% | 67 | 47% | 33 | 55% | 122 | 42% | 70 | 51% | 70 | 51% |
| Girl | 381 | 53% | 76 | 53% | 26 | 43% | 169 | 58% | 65 | 48% | 65 | 48% |

Anemia

In 2015, 40% of the 798 children were anemic (in 2014 also 40%). In 2016, only 30% of the children were anemic. The highest prevalence was seen in Masaini (40%), Mikocheni Ndogo (38%) and Mikocheni Kubwa (37%). Separate analysis of the Masai tribe, showed a prevalence of anemia of 48% (highest prevalence in Mikocheni Kubwa of 58%).
In general, Masai might experience differences in living conditions, food availability and eating tradition when compared to the other tribes, which might explain this high prevalence when compared to the other sub-villages.

All children with anemia were treated with iron or multivitamins.

A total of 28 (4%) children had an Hb below 5 mmol/l (compared to 41 (5%) in 2015). Of the 28 children, 19 were from the Masai tribe. All these children were treated and 25 will be invited for an Hb re-check after 3 months. In addition, all children with a Hb below 5 mmol/l were investigated for malaria and referred to TPC hospital if required (6 children were referred).

**Table 3: Prevalence of anemia per geographical location by age and gender**

| | Total | | Kirungu | | Masaini | | Mikocheni Kubwa | | Mikocheni Ndogo | | Samanga | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 713 | | Total=143 | | Total=60 | | Total=291 | | Total=136 | | Total=83 | |
| | N | % | N | % | N | % | N | % | n | % | n | % |
| Anaemia | 213 | 30% | 18 | 13% | 24 | 40% | 108 | 37% | 51 | 38% | 12 | 14% |
| No anaemia | 474 | 66% | 108 | 76% | 35 | 58% | 178 | 61% | 84 | 62% | 69 | 83% |
| Unknown | 17 | 2% | 17 | 12% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Hb <5,0 mmol | 28 | 4% | 1 | 1% | 2 | 3% | 19 | 7% | 6 | 4% | 0 | 0% |
| **Anaemia per age** | | | | | | | | | | | | |
| <=1 year | 50 | 36% | 4 | 18% | 5 | 56% | 28 | 48% | 9 | 33% | 4 | 19% |
| >1 en <5 years | 78 | 36% | 7 | 19% | 11 | 50% | 37 | 42% | 18 | 46% | 5 | 16% |
| <5 years | 122 | 35% | 11 | 19% | 15 | 50% | 60 | 43% | 27 | 41% | 9 | 17% |
| >=5 en <=10 years | 82 | 24% | 7 | 9% | 10 | 37% | 39 | 29% | 23 | 34% | 3 | 10% |
| >10 years | 10 | 29% | 0 | 0% | 0 | 0% | 9 | 50% | 1 | 33% | 0 | 0% |
| **Anaemia per gender** | | | | | | | | | | | | |
| Boy | 100 | 30% | 8 | 12% | 13 | 39% | 49 | 40% | 24 | 34% | 6 | 17% |
| Girl | 112 | 29% | 10 | 13% | 11 | 42% | 59 | 35% | 26 | 40% | 6 | 13% |

During the medical check-ups, we gave nutritional advice to all children and their guardians with emphasis on vegetable intake and vitamin C. When it comes to the prevention of anemia, the vitamin C intake is important because vitamin C facilitates the uptake of iron in the gut (while milk and tea reduce its uptake). Therefore we recommend to add a vitamin C source

to the school meal, e.g. a ¼ orange, lemon or tomato. As already planned for Kirungu, children might benefit from the school gardens and trees to be planted at the school. Not only when the fruits and vegetables are added to the school meal, but also as an educational point of view.
For babies, we advised exclusive breastfeeding up to six months, then start with the introduction of normal food and we discussed the possibilities of donation of breast milk by another woman when the normal supply is lacking.

Malaria tests were performed if suspected based on medical history, or based on an Hb below 5 mmol/l. From 27 malaria tests, 0 tested positive (3 out of 47 in 2015).
A HIV counsellor was present during the medical camp. All parents received counselling. Unfortunately, only a few HIV tests were available in Tanzania this year. Of the 3 tests performed, one child was tested positive. We would like to stress the importance of trying to provide HIV tests for the medical camp in 2017 (at least 100), because in 2014 7 out of 87 HIV tests were positive. In 2015 no HIV tests were available.

Underweight, stunting and wasting
In total 10% (2015:17%; 2014: 13%) of the children in Mikocheni were underweight, 10% (2015:17%; 2014: 24%) were stunted and 8% (2015: 11%; 2014: 10%) wasted. Details can be found in tables 4, 5 and 6. In general, the prevalence of underweight, stunting and wasting has improved in 2016, when compared to 2015 and 2014. For the Masai tribe, the prevalences were 13% for underweight, 8% for stunting, and 12% for wasting 12% (no significant differences when compared to the whole population).

The millennium development goal for underweight is 15%. The WHO recently reported that of Tanzanian children < 5 years 13.4% are underweight, 34.7% suffers from wasting and 3.8% are stunted (WHO World statistics 2015). .
Of children under five in Mikocheni 6% are underweight, 12% are wasted and 6% are stunted. Thus, the children of Mikocheni do better when compared to the overall WHO figures for underweight, stunting and wasting.

Stunting, i.e. low height for age, is caused by long-term insufficient nutrient intake and frequent infections. Stunting generally occurs before age two, and effects are largely irreversible and have a huge impact on general development, school results and financial situation in later life. Wasting, i.e. low weight for height, is a strong predictor of mortality among children under five. It is usually the result of acute significant food shortage and/or disease.
Underweight encompasses both stunting and wasting.

Additional attention might be paid to availability of nutritious food in Mikocheni. Possibilities to include a food program in the school, or to improve current food programs should be investigated. Furthermore, advice on hygiene and anti-worm treatment, are of importance to prevent gastro-intestinal infections leading to growth abnormalities. We were very impressed to see that the school in Kirungu now has water taps.

**Table 4: Prevalence of weight/age at or under P3 (underweight) per geographical location by age and gender**

| | Total | | Kirungu | | Masaini | | Mikocheni Kubwa | | Mikocheni Ndogo | | Samanga | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 713 | | Total=143 | | Total=60 | | Total=291 | | Total=136 | | Total=83 | |
| | N | % | n | % | n | % | n | % | N | % | n | % |
| Underweight | 66 | 10% | 6 | 4% | 8 | 15% | 31 | 11% | 17 | 13% | 4 | 5% |
| No underweight | 611 | 90% | 129 | 95% | 47 | 85% | 241 | 89% | 116 | 87% | 78 | 95% |
| Unknown | 35 | 5% | 7 | 5% | 5 | 8% | 19 | 7% | 3 | 2% | 1 | 1% |
| **Underweight children per age** | | | | | | | | | | | | |
| <=1 year | 6 | 4% | 0 | 0% | 1 | 11% | 4 | 7% | 0 | 0% | 1 | 5% |
| >1 en <5 years | 17 | 8% | 3 | 8% | 2 | 9% | 7 | 8% | 3 | 8% | 2 | 6% |
| <5 years | 22 | 6% | 3 | 5% | 3 | 10% | 10 | 7% | 3 | 5% | 3 | 6% |
| >=5 en <=10 years | 44 | 13% | 3 | 4% | 5 | 19% | 21 | 16% | 14 | 21% | 1 | 3% |
| >10 years | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| **Underweight children per gender** | | | | | | | | | | | | |
| Boy | 29 | 9% | 4 | 6% | 5 | 16% | 11 | 9% | 8 | 12% | 1 | 3% |
| Girl | 37 | 10% | 2 | 3% | 3 | 13% | 20 | 13% | 9 | 14% | 3 | 7% |

**Table 5: Prevalence of length/age at or under P3 (stunting) per geographical location by age and gender**

| | Total | | Kirungu | | Masaini | | Mikocheni Kubwa | | Mikocheni Ndogo | | Samanga | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 713 | | Total=143 | | Total=60 | | Total=291 | | Total=136 | | Total=83 | |
| | N | % | n | % | n | % | n | % | n | % | n | % |
| Stunting | 72 | 10% | 12 | 8% | 6 | 10% | 33 | 11% | 13 | 10% | 8 | 10% |
| No stunting | 635 | 89% | 130 | 91% | 53 | 88% | 256 | 89% | 121 | 90% | 75 | 90% |
| Unknown | 3 | 0% | 0 | 0% | 0 | 0% | 2 | 1% | 1 | 1% | 0 | 0% |
| **Stunting children per age** | | | | | | | | | | | | |
| <=1 year | 18 | 13% | 1 | 5% | 2 | 22% | 9 | 16% | 4 | 15% | 2 | 10% |
| >1 en <5 years | 26 | 12% | 5 | 14% | 2 | 9% | 12 | 14% | 2 | 5% | 5 | 16% |
| <5 years | 41 | 12% | 6 | 10% | 4 | 13% | 18 | 13% | 6 | 9% | 7 | 13% |
| >=5 en <=10 years | 23 | 7% | 4 | 5% | 2 | 7% | 10 | 7% | 7 | 10% | 0 | 0% |
| >10 years | 8 | 24% | 2 | 25% | 0 | 0% | 5 | 29% | 0 | 0% | 1 | 100% |
| **Stunting children per gender** | | | | | | | | | | | | |
| Boy | 35 | 11% | 5 | 7% | 5 | 15% | 14 | 11% | 7 | 10% | 4 | 11% |
| Girl | 37 | 10% | 7 | 9% | 1 | 4% | 19 | 11% | 6 | 9% | 4 | 9% |

**Table 6: Prevalence of weight/length at or under P3 (wasting) per geographical location by age and gender**

| | Total | | Kirungu | | Masaini | | Mikocheni Kubwa | | Mikocheni Ndogo | | Samanga | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 713 | | Total=143 | | Total=60 | | Total=291 | | Total=136 | | Total=83 | |
| | N | % | n | % | n | % | n | % | n | % | n | % |
| Wasting | 43 | 8% | 2 | 2% | 8 | 20% | 30 | 14% | 2 | 2% | 1 | 1% |
| No wasting | 494 | 91% | 101 | 97% | 32 | 80% | 190 | 86% | 102 | 96% | 69 | 99% |
| Unknown | 173 | 24% | 39 | 27% | 20 | 33% | 71 | 24% | 30 | 22% | 13 | 16% |
| **Wasting children per age** | | | | | | | | | | | | |
| <=1 year | 6 | 4% | 0 | 0% | 1 | 11% | 5 | 9% | 0 | 0% | 0 | 0% |
| >1 en <5 years | 15 | 7% | 1 | 3% | 3 | 14% | 10 | 11% | 1 | 3% | 0 | 0% |
| <5 years | 19 | 6% | 1 | 2% | 4 | 13% | 13 | 10% | 1 | 2% | 0 | 0% |
| >=5 en <=10 years | 23 | 12% | 1 | 2% | 4 | 36% | 16 | 20% | 1 | 2% | 1 | 6% |
| >10 years | 1 | 33% | 0 | 0% | 0 | 0% | 1 | 50% | 0 | 0% | 0 | 0% |
| **Wasting children per gender** | | | | | | | | | | | | |
| Boy | 20 | 8% | 1 | 2% | 7 | 28% | 11 | 12% | 1 | 2% | 0 | 0% |
| Girl | 22 | 8% | 1 | 2% | 1 | 7% | 19 | 15% | 1 | 2% | 0 | 0% |

Deworming

The WHO recommends deworming in their current programs (2012, Deworming to combat the health and nutritional impact of soil-transmitted helminths; biological, behavioural and contextual rationale). Soil-transmitted helminths, which include roundworms (*Ascaris lumbricoides*), whipworms (*Trichuris trichiura*) and hookworms (*Necator americanus* and *Ancylostoma duodenale*), are amongst the most common causes of worm infections in people who live in the developing world.

In general, Tanzania is still considered a country with a high prevalence (>50%) of soil-transmitted helminthiases (WHO, 2010, Working to overcome the global impact of neglected tropical diseases, First WHO report on neglected tropical diseases).

FTK implemented a deworming program in Mikocheni. In May 2016, > 4600 children received a deworming tablet. The program was implemented in schools, and therefore for mainly addressed to children > 5 years. All schools were given deworming tablets and information on administration and side-effects by FTK. The recommended drugs (albendazole 400 mg or mebendazole 100 mg) are effective, inexpensive and easy to administer by non-medically trained personnel.

Of all children checked in the medical camp, 38% reported to have received deworming treatment in the last 6 months before the medical camp (see table 7a). In the Masai tribe, 29% of the children received deworming treatment. Of the children > 5 years of age 54% received deworming treatment in the last 6 months. We were surprised to find this relatively low percentage, because all children going to school in Mikocheni are considered to be in the FTK deworming program. A reason for this relatively low number could be that our medical camp was visited by a population with low school attendance. Another possibility is that caretakers tended to answer this question negatively to ensure distribution of medication at the camp. Or that the question might not be clearly asked at the registration desk, because the answer sometimes changed on asking when exactly the child got it's last deworming treatment, during the medical history taken by the doctors. However, this last possibility cannot be the most important one, since we also found differences amongst the villages.

**Table 7a: Prevalence preventive anti-worm treatment in the last half-year per geographical location by age and gender**

| | Total | | Kirungu | | Masaini | | Mikocheni Kubwa | | Mikocheni Ndogo | | Samanga | | Masai Tribe | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 713 | | Total=143 | | Total=60 | | Total=291 | | Total=136 | | Total=83 | | | |
| | N | % | n | % | N | % | N | % | n | % | n | % | n | % |
| Anti-worm | 270 | 38% | 84 | 59% | 21 | 35% | 112 | 38% | 40 | 29% | 13 | 16% | 70 | 29% |
| No anti-worm | 442 | 62% | 59 | 41% | 39 | 65% | 179 | 62% | 95 | 70% | 70 | 84% | 167 | 70% |
| **Anti-worm per age** | | | | | | | | | | | | | | |
| <=1 year | 16 | 12% | 0 | 0% | 2 | 22% | 9 | 16% | 3 | 11% | 2 | 10% | 4 | 11% |
| >1 en <5 years | 55 | 25% | 14 | 39% | 6 | 27% | 21 | 24% | 9 | 23% | 5 | 16% | 17 | 22% |
| <5 years | 69 | 20% | 14 | 24% | 7 | 23% | 29 | 21% | 12 | 18% | 7 | 13% | 20 | 18% |
| >=5 en <=10 years | 182 | 54% | 62 | 81% | 10 | 37% | 78 | 58% | 26 | 39% | 6 | 21% | 44 | 38% |
| >10 years | 19 | 56% | 8 | 100% | 4 | 100% | 5 | 28% | 2 | 67% | 0 | 0% | 6 | 50% |

The highest coverage of deworming was seen in Kirungu, 81% of the children between 5 and 10, and 100% of the children above 10 years received deworming treatment, which might be maximal due to the FTK school deworming program. Overall the highest coverage was seen for the children above 5 years. Further efforts might be taken to increase the coverage in the other villages, and also for the children between 2 and 5 and their parents and other villagers.

The lowest coverage of deworming treatment was seen in Samanga and Mikocheni Ndogo, which might need further investigation by FTK.

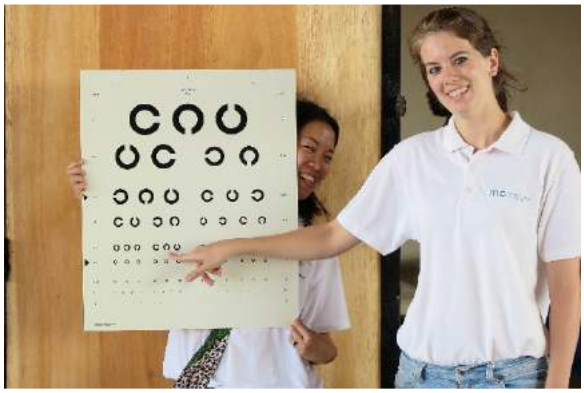
In comparison to the medical camp in 2015 we found a lower deworming percentage (see table 7b). This is in accordance with the relatively low percentage of schoolchildren who were dewormed despite the increasing numbers of children being dewormed by FTK. We cannot explain these contradictory findings.

**Table 7b: Prevalence preventive anti-worm treatment in the last half-year per year**

| Location | Total 2014 | Total 2015 | Total 2016 |
|---|---|---|---|
| Total | 40% | 51% | 38% |

During the 2016 medical camp, an active worm infection was suspected in 3 children. This might be an underestimation in view of the 51 cases that were suspected in 2015 (6%), since no faeces examination was performed and diagnoses was based on history. Another possibility is that our reported deworming percentages were underestimated and that with many more children being dewormed through the FTK program, less worm infections were found. Two children were diagnosed with dysenteria, 7 with diarrhea and 2 with gardia (suspected).

Simple ways of improving personal hygiene and sanitation through hand washing, nail trimming, wearing of shoes and use of a latrine and clear water supplies were encouraged.
Although all members of a population can be infected by worms, those who are at most risk and would benefit most from preventive interventions are the pre-school (2-5 years), school age children, adolescent girls and women of childbearing age.



Other diagnoses and referrals

Other diagnoses included dermatomycosis (112 children), clinical signs of vitamin deficit (11), eczema (18), psychomotor retardation (3), epilepsy (1), umbilical hernia (24), pathological heart murmur (2), pneumonia (8), diarrhoea (10), ear problems (10), dental caries (89) and dental fluorosis (128). Details can be found in Table 1-1 in the appendix.

If necessary, children were referred to TPC or CCBRT.
We referred 25 children to medical specialists in TPC Hospital for further diagnoses and/or treatment, e.g. for HIV, suspected heart defect, severe anemia evaluation and treatment, CHARGE syndrome, umbilical hernia or dental care. Furthermore, 31 children were referred to and seen by CCBRT (16 in 2014). Some of the children were already known by CCBRT.

Furthermore, we identified 20 children who might need more attention, through a social program or feeding program, e.g. for children of single mothers, children suspected of parental negligence, children who admitted not to attend school on a regular basis, or children from extremely poor parents. The village managers and HBC's were asked to visit these families throughout the year to further discuss the situation and arrange for follow-up.

In order to support follow-up by FT Kilimanjaro and TPC hospital, lists of children referred to TPC hospital for specialist medical attention or an Hb-check after three months were sent by MCC to Gerbert Rieks.

Most of the children seen by CCBRT will be further referred to a specialist at CCBRT or at KCMC. These visits will be coordinated and supported by FTK. Some of the children were referred to CCBRT for a week of intensive treatment and training of parents.

Conclusions and recommendations

MCC is delighted to hear that there is a TPC outreach program in place in the sub-villages with a frequency of once per month and for children under five twice a month.
In addition to this, it is recommended to start education programs for mothers on mother/child care. Several topics can be considered: improvement of child food, education on breast feeding and additional feeding, education on hygiene and importance of deworming and education of the HBC (e.g. first aid training).

Although there is a deworming program in place, we still see a lot of children which are not in the deworming program, which also differed for the various subvillages. As the FTK deworming program is focused on the schoolchildren, and we see children between 0 and 9 years old, it is not a surprise 62% of children in medical camp did not receive a deworming agent in the last 6 months. FTK might discuss with the health posts, and governmental institutes how the deworming is arranged for the younger children, and how it can be improved. Again we would like to stress the importance of a sound deworming program for the overall population, twice a year.
This year we started the gradual handing over of running the medical camp from MCC to FTK. The cooperation between FTK and MCC workers worked generally well. FTK workers can fully run the first 3 stations (registration, measuring height/weight, and Hb-check). Although, there is still a need for a general coordinator at these first stations, to help organize, to speed up the process if necessary, and to take care of special cases.
At the doctor's station, the Tanzanian doctors initially worked mainly as translators, but during the course of the week, they worked more independently. It seems that MCC doctors tend to be more restrained in prescribing medication or referring children to hospitals for further examination than the Tanzanian doctors. This is something FTK should consider in future medical camps, as it will affect the financial budget but also the need for further coordination and follow-up for referred children. Once referred, the children should get the medication attention they need, and in most cases this means that arrangements should include transport and guidance to and in the hospital.
This year, the pharmacy was completely run by MCC, as we choose to focus on handing over the first 3 to 4 stations. For next year, we need to prepare for a further transfer of the doctor's and pharmacy stations.
With regard to pharmacy the initial thoughts are to set up two pharmacies: one for multi-vitamin and deworming, and one for all other medication. The first pharmacy can be gradually transferred to FTK, while the second pharmacy will still be covered by MCC. Another option is that an MCC associate will oversee activities at the pharmacy at all times We find this very important, because the pharmacy is the final medical station and therefore also a checkpoint to ascertain that we work according to the standards set by ourselves and by MCC. Since the

end to end responsibility still lies with MCC, it needs to be able to oversee the medical decisions being made. It is of course our goal to completely transfer all responsibilities to FTK associates, including the pharmacy.

For the coming years the following organization of MCC and FTK workers is scheduled:

| **Position** | **2017** | **2018** |
|---|---|---|
| Medical officer in charge | 1 TZ | 1 TZ |
| Logistical officer | 1 NL, 1 TZ | 1 NL, 1 TZ |
| Doctors | 3 NL, 3 TZ | 2 NL, 4 TZ |
| Registration | 2 TZ | 2 TZ |
| Measuring height/weight | 2 TZ | 2 TZ |
| Blood check | 1 NL, 1 TZ | ½ NL, 2 TZ |
| Pharmacy | 1 NL, 1 TZ | ½ NL, 2 TZ |
| | | |
| Total | 6 NL | 4 NL |

NL: MCC workers
TZ: FTK workers (excluding helpers and translators)

Details of the 2018 medical camp will be discussed after the finalization of the 2017 medical camp.

As indicated last year, we would recommend to provide the HBC of Mikocheni Ndogo and other villages with a first aid box, in order to help the people from this remote village lacking a dispensary. The first aid box might be accompanied by an inventory list and distribution list. Contents of the first aid kit might be discussed with the HBC and TPC hospital (e.g. gloves, gauze, antiseptic wipes, tape, hand sanitizer, bandage, scissors, triangular bandage, ORS, flammazine). First aid training might also be considered for the HBCs.
In addition, we would recommend to train the HBC or FTK workers embedded in the Mikocheni area in the coming year in health care topics, e.g. nutrition, mother-child care, to improve their health motivation skills.
MCC is very pleased to hear of the increasing success of the deworming program set up by FTK in Mikocheni. This deworming program is school based. In addition, there is a deworming program executed by the District. However, still not all children received deworming treatment (approximately 62%). Therefore, we would recommend to further discus deworming with the District Medical Officer (DMO), and investigate how children aged two and above can be reached, in order to attain a better coverage of the children in Mikocheni.

One of the expected non-measured benefits of the medical camps is considered the transfer of knowledge. Knowledge about the importance of hygiene, deworming and nutritious foods.

MCC considered this year's education program, by Patience, Shayenne and Janine a big success. We hope to continue next year with a comparable group of motivated FTK workers in this station. MCC and FTK need to discuss further topics and education methods to try and bring the most relevant messages across.
Considering the high prevalence of dental caries (89 children, which might be an underestimation), the importance of oral hygiene should be further considered. FTK might want to consider implementing brushing programmes at the schools, following the example of the "Brush at school (BAS) program of the Netherlands Oral Health Society (NOHS, http://www.nohs.nl/).

As a high prevalence of anemia remains is seen in the Masai tribe, we would recommend to pay special attention to this tribe, with regard to the education programs. FTK might investigate how we could better reach this group, in order to provide extra education on food and hygiene habits as well as emphasizing the importance of deworming. It might be helpful to include more Masai translators to the medical camp.

In Mikocheni, we performed a medical camp for 713 children, which is a lower number than in 2015 (798). We recommend that in preparation of next year's medical camp FTK needs to evaluate why less children attended (are there obstacles which can be addressed?) and find out how to get more children to the medical camp, e.g. more attention to the announcements, slightly increasing the age limit, inviting children from other villages, etc. However, we need to highlight that MCC was thrilled by the presence of so many caretakers during the medical camp.

**Last words:**
We are very grateful for all work performed by Gerbert, Eunice, Stella, Harry, translators and helpers during the medical camps in Mikocheni. We could not have performed our work without their presence and hard work. We were also very pleased with the assistance of the three HBC's during the medical camp in Mikocheni; their activities related to health care in Mikocheni should be encouraged!
The cooperation with TPC, TPC hospital, CCBRT and KCMC hospital is of greatest importance for all the children that need additional help. We are grateful for the efforts by FTK to keep all parties united.

Although much improvement is still needed in the general health care of the children of Mikocheni, Kirungu and Samanga, we feel confident that a lot will be achieved in the following years. We would therefore like to thank all people of FTK, TPC, TPC hospital and CCBRT for their enthusiasm and cooperation.

Iris van de Gevel and Eryn Liem

## Annex 1 – Detailed tables for Mikocheni

**Table Annex 1 – 1: Disease prevalence among all children per geographical location**

| | Total | | Kirungu | | Masaini | | Mikochenie Kubwa | | Mikochenie Ndogo | | Samanga | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 713 | | Total= 143 | | Total= 60 | | Total= 291 | | Total= 136 | | Total= 83 | |
| | N | % | n | % | n | % | n | % | n | % | n | % |
| Underweight | 66 | 9% | 6 | 4% | 8 | 13% | 31 | 11% | 17 | 13% | 4 | 5% |
| Stunting | 72 | 10% | 12 | 8% | 6 | 10% | 33 | 11% | 13 | 10% | 8 | 10% |
| Wasting | 43 | 6% | 2 | 1% | 8 | 13% | 30 | 10% | 2 | 1% | 1 | 1% |
| Anaemia | 213 | 30% | 18 | 13% | 24 | 40% | 108 | 37% | 51 | 38% | 12 | 14% |
| HIV pos. | 1 | 0% | 0 | 0% | 0 | 0% | 1 | 0% | 0 | 0% | 0 | 0% |
| Malaria (suspected) | 2 | 0% | 0 | 0% | 0 | 0% | 1 | 0% | 1 | 1% | 0 | 0% |
| vitamin deficit (clinical signs) | 11 | 2% | 2 | 1% | 0 | 0% | 5 | 2% | 4 | 3% | 0 | 0% |
| syndrome n.o.s. | 3 | 0% | 0 | 0% | 0 | 0% | 3 | 1% | 0 | 0% | 0 | 0% |
| pneumonia (clinical) | 6 | 1% | 0 | 0% | 0 | 0% | 2 | 1% | 4 | 3% | 0 | 0% |
| pneumonia (X-ray confirmed) | 2 | 0% | 0 | 0% | 0 | 0% | 2 | 1% | 0 | 0% | 0 | 0% |
| bronchitis | 6 | 1% | 0 | 0% | 4 | 7% | 1 | 0% | 0 | 0% | 1 | 1% |
| BHR/asthma | 1 | 0% | 0 | 0% | 0 | 0% | 1 | 0% | 0 | 0% | 0 | 0% |
| gardia (suspected) | 2 | 0% | 1 | 1% | 0 | 0% | 1 | 0% | 0 | 0% | 0 | 0% |
| dysenteria | 2 | 0% | 1 | 1% | 0 | 0% | 0 | 0% | 1 | 1% | 0 | 0% |
| dehydration : acute diarrhoea | 3 | 0% | 1 | 1% | 0 | 0% | 1 | 0% | 0 | 0% | 1 | 1% |
| diarrhoea without dehydration | 7 | 1% | 2 | 1% | 0 | 0% | 4 | 1% | 1 | 1% | 0 | 0% |
| Constipation | 1 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 1 | 1% | 0 | 0% |
| active worm infection | 3 | 0% | 0 | 0% | 0 | 0% | 2 | 1% | 1 | 1% | 0 | 0% |
| otitis media acuta | 4 | 1% | 1 | 1% | 0 | 0% | 1 | 0% | 2 | 1% | 0 | 0% |
| otitis media with effusion | 1 | 0% | 0 | 0% | 0 | 0% | 1 | 0% | 0 | 0% | 0 | 0% |
| otitis externa | 5 | 1% | 1 | 1% | 1 | 2% | 2 | 1% | 0 | 0% | 1 | 1% |
| (adeno)tonsillitis | 2 | 0% | 1 | 1% | 0 | 0% | 1 | 0% | 0 | 0% | 0 | 0% |
| candida stomatitis | 2 | 0% | 0 | 0% | 0 | 0% | 2 | 1% | 0 | 0% | 0 | 0% |
| sinusitis | 1 | 0% | 0 | 0% | 0 | 0% | 1 | 0% | 0 | 0% | 0 | 0% |
| other | 4 | 1% | 1 | 1% | 0 | 0% | 2 | 1% | 1 | 1% | 0 | 0% |
| cariës n.o.s. | 89 | 12% | 34 | 24% | 6 | 10% | 20 | 7% | 22 | 16% | 7 | 8% |
| pain n.o.s | 2 | 0% | 0 | 0% | 1 | 2% | 0 | 0% | 0 | 0% | 1 | 1% |
| fluorosis | 128 | 18% | 41 | 29% | 11 | 18% | 31 | 11% | 25 | 18% | 20 | 24% |
| caries with pain | 5 | 1% | 2 | 1% | 1 | 2% | 1 | 0% | 1 | 1% | 0 | 0% |
| wounds n.o.s. | 2 | 0% | 0 | 0% | 0 | 0% | 1 | 0% | 0 | 0% | 1 | 1% |
| eczema n.o.s. | 18 | 3% | 2 | 1% | 2 | 3% | 9 | 3% | 2 | 1% | 3 | 4% |
| dermatomycosis | 112 | 16% | 17 | 12% | 20 | 33% | 44 | 15% | 17 | 13% | 14 | 17% |
| Impetigo/furunculosis | 12 | 2% | 0 | 0% | 1 | 2% | 8 | 3% | 0 | 0% | 3 | 4% |
| scabies | 3 | 0% | 0 | 0% | 0 | 0% | 3 | 1% | 0 | 0% | 0 | 0% |
| wounds infected, | 1 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 1 | 1% |
| insect bite | 2 | 0% | 1 | 1% | 0 | 0% | 1 | 0% | 0 | 0% | 0 | 0% |
| other (psoriasis etc) | 8 | 1% | 2 | 1% | 0 | 0% | 2 | 1% | 2 | 1% | 2 | 2% |
| psychomotoric retardation | 3 | 0% | 0 | 0% | 0 | 0% | 1 | 0% | 0 | 0% | 2 | 2% |
| epilepsy | 1 | 0% | 0 | 0% | 1 | 2% | 0 | 0% | 0 | 0% | 0 | 0% |
| physiological murmer | 7 | 1% | 3 | 2% | 1 | 2% | 1 | 0% | 2 | 1% | 0 | 0% |
| pathological murmur (suspected) | 2 | 0% | 2 | 1% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| strabismus | 2 | 0% | 0 | 0% | 0 | 0% | 2 | 1% | 0 | 0% | 0 | 0% |
| keratoconjunctivitis | 5 | 1% | 1 | 1% | 0 | 0% | 2 | 1% | 2 | 1% | 0 | 0% |
| cryptorchism | 1 | 0% | 0 | 0% | 0 | 0% | 1 | 0% | 0 | 0% | 0 | 0% |

| | Total | | Kirungu | | Masaini | | Mikochenie Kubwa | | Mikochenie Ndogo | | Samanga | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 713 | | Total= 143 | | Total= 60 | | Total= 291 | | Total= 136 | | Total= 83 | |
| | N | % | n | % | n | % | n | % | n | % | n | % |
| urinary infection | 3 | 0% | 0 | 0% | 0 | 0% | 2 | 1% | 1 | 1% | 0 | 0% |
| new fracture | 1 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 1 | 1% | 0 | 0% |
| hernia(umbilical etc) | 24 | 3% | 4 | 3% | 1 | 2% | 13 | 4% | 3 | 2% | 3 | 4% |

**Table Annex 1-2: Treatment among all children per geographical location**

| | Total | | Kirungu | | Masaini | | Mikochenie Kubwa | | Mikochenie Ndogo | | Samanga | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 713 | | Total= 143 | | Total= 60 | | Total= 291 | | Total= 136 | | Total= 83 | |
| | N | % | n | % | n | % | n | % | n | % | n | % |
| ferro | 135 | 19% | 13 | 9% | 18 | 30% | 59 | 20% | 39 | 29% | 6 | 7% |
| mother iron | 3 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 2 | 1% | 1 | 1% |
| multivitamins | 213 | 30% | 28 | 20% | 18 | 30% | 93 | 32% | 49 | 36% | 25 | 30% |
| anti-worm | 321 | 45% | 40 | 28% | 30 | 50% | 123 | 42% | 72 | 53% | 56 | 67% |
| acute worm | 10 | 1% | 2 | 1% | 0 | 0% | 2 | 1% | 6 | 4% | 0 | 0% |
| anti-scabies | 4 | 1% | 0 | 0% | 0 | 0% | 4 | 1% | 0 | 0% | 0 | 0% |
| amoxicillin | 18 | 3% | 1 | 1% | 3 | 5% | 7 | 2% | 5 | 4% | 2 | 2% |
| augmentin | 4 | 1% | 1 | 1% | 0 | 0% | 2 | 1% | 1 | 1% | 0 | 0% |
| 2e lijns antibiotica | 5 | 1% | 1 | 1% | 0 | 0% | 4 | 1% | 0 | 0% | 0 | 0% |
| metranidazol | 8 | 1% | 3 | 2% | 0 | 0% | 4 | 1% | 1 | 1% | 0 | 0% |
| paracetamol | 1 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 1 | 1% | 0 | 0% |
| ORS | 4 | 1% | 0 | 0% | 0 | 0% | 3 | 1% | 0 | 0% | 1 | 1% |
| eardrops | 8 | 1% | 0 | 0% | 1 | 2% | 3 | 1% | 3 | 2% | 1 | 1% |
| mupirocine=Bactroban | 1 | 0% | 0 | 0% | 0 | 0% | 1 | 0% | 0 | 0% | 0 | 0% |
| hydrocortisone cream | 20 | 3% | 3 | 2% | 2 | 3% | 9 | 3% | 3 | 2% | 3 | 4% |
| dactarin cream | 71 | 10% | 5 | 3% | 11 | 18% | 38 | 13% | 8 | 6% | 9 | 11% |
| dactacort cream | 2 | 0% | 0 | 0% | 1 | 2% | 1 | 0% | 0 | 0% | 0 | 0% |
| fusidin cream | 7 | 1% | 0 | 0% | 0 | 0% | 6 | 2% | 0 | 0% | 1 | 1% |
| sudo cream | 2 | 0% | 0 | 0% | 0 | 0% | 2 | 1% | 0 | 0% | 0 | 0% |
| duratears | 8 | 1% | 0 | 0% | 1 | 2% | 4 | 1% | 3 | 2% | 0 | 0% |
| prednisone eyedrops | 6 | 1% | 1 | 1% | 1 | 2% | 3 | 1% | 1 | 1% | 0 | 0% |
| ciproxin/gentamycine/chloram eyedrops | 5 | 1% | 3 | 2% | 0 | 0% | 2 | 1% | 0 | 0% | 0 | 0% |
| griseofulvin | 5 | 1% | 0 | 0% | 1 | 2% | 3 | 1% | 1 | 1% | 0 | 0% |
| ciproxin | 1 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 1 | 1% | 0 | 0% |