Medical Checks for Children

Medical Report
Tanzania Mtakuja 2011

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8 February 2012

Introduction:
In the fourth week of August 2011, Medical Checks for Children (MCC) visited for the third time Mtjakuja, a small village in the North of Tanzania (Africa).
The MCC team checked and treated free of cost 1219 children (mainly aged 9 years and below).The medical camp was organized for seven days starting the 21th of August, at two different locations.

The MCC team consisted of eleven members from The Netherlands: Karlien Bongers (medical-end-responsible and mission leader, general surgeon and consultant), Iris van de Gevel (organization-end-responsible, toxicologist/regulatory affairs manager), Anne Vlietstra (family doctor), Gabrielle Rutten (general doctor and consultant), Tamara Soeterik (family doctor), Bram Felius (paediatrician), Sonja Vlietstra (retired head teacher), Roos Tacken (childrens psychotherapist), Dini van der Worm (nurse and consultant), Ella van Tunen (secretary and personal assistant) and Frank van Tunen (financial administrator).

The medical checks were organized in close cooperation with The Mtakuja Development Project, a partnership between Mtakuja village and the Dutch NGO FD Kilimanjaro with the aim to eradicate poverty from the community of Mtakuja.
The village is located in the Kilimanjaro Region of northern Tanzania. It has approximately 4250 inhabitants (2008) of whom more than 50% are younger than 20 years of age.
The nearest hospital is Tanganyika Planting Company (TPC) hospital, approximately 6 to 11 km from Mtakuja (2-3 hours by foot, 1-2 hours by bike).

Technical equipment and some of the supplies and medication were brought from Europe by MCC team members.
Most of the medication was ordered by Gerbert Rieks from TPC hospital with help of Dr. Harry Mwerinde. An overview of all purchased medicine can be found in Appendix D.
Soap and tooth paste for every child was purchased from local shops in Moshi and was sponsored by Sonja Vlietstra.
Toothbrushes were donated by Ricoh Nederland BV and Sonja Vlietstra.

The cooperation of FD Kilimanjaro (in person of Gerbert Rieks and Stella Mserikie) existed out 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.
- Arranging the cooperation with eye doctor Chantal Giramahoro (KCMC), CCBRT and Pius Tarimo, dental assistant and Tamari Moses HIV counselar of TPC hospital.

We are grateful to all the parents, care takers and community people for bringing the children and helping to conduct the program. We are happy we got the opportunity to work with and to learn from all volunteers, translators and other supporting members who have helped directly or indirectly, despite their own obligations.
Our special thanks go to Stella Msarikie and Gerbert Rieks for their support and enthusiasm which gave MCC the opportunity to work in the medical camp and examine and treat the children of Mtakutja.
Special thanks go to the translators and local helpers Peris Liverson, Elda Frederick, Hysinta Massawe, Felista Haule, Sister Makinyange, Elizabeth Alexander, Elisabeth Daniel, Ibrahim Lema, Ian Saria, Constantine Ngowi and Elizabeth Edward. We hope they will continue to inspire their communities in the same way they inspired us as they play a vital role in spreading awareness and knowledge about health and its importance for children in reaching their developmental potential.

Special thanks go as well to Tamari Moses, HIV/AIDS counselar and Pius Tarimo, dentist, both staff of the TPC hospital for being part of the MCC carrousel.
We were delighted to welcome again Chantal Giramahoro the eye doctor of the Kilimanjaro Christian Medical Centre (KCMC) and Augusto Zambaldo with the team of CCBRT on location and enjoyed working together and learning from each other.
We are grateful to TPC for providing board and lodging for the MCC team.
We would also like to thank doctor Harry Mwerinde of TPC hospital for all the work he did to make this MCC mission a success.

Medical Checks for Children on location:
The medical checks of the 1219 children were performed in seven days at two different locations. The first four days MCC was based at the new Community health centre, and the last three days in Mtakuja Primary school. During the free of costs medical checks, the children were checked following the MCC carrousel:

1. Registration of the child
2. Measuring height and weight
3. Food and water inventory
4. Blood test (haemoglobin)
5. Physical examination by a medical doctor
6. Giving medication (pharmacy)
7. HIV/AID counseling
8. Education on tooth brushing (a tooth brush, soap and tooth paste was given to each child)

At each station, and specially 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 anaemia, growth abnormalities, worm infections and HIV/Aids. For the first time of the history of MCC, HIV test was performed for all mothers (voluntary) and on medical indication for children as part of the carrousel.

At registration, efforts were made in order to retrieve the forms of all children seen in 2010 and 2009 in the medical camp. Of all children seen in this year, 416 children (38%) were seen in 2009, 2010 and 2011, 218 children (18%) were seen in 2010 and 2011 and for 516 children (42%) 2011 was their first check-up or we could not find their forms from former years.
Since the age distribution in these three groups of children is not the same (see table 1a), we can not the compare the groups without any bias. In the group of children which we checked in 2010 and 2011 more children are in age category one to five years of age. At this age growth disturbances and anaemia is more common.

Table 1a *Summary of number check-ups by age and years of check-uo*

LOCATION	Only checked in 2011				Checked in 2010 & 2011				Checked in 2009 & 2010 & 2011			
	N			%	N			%	N			%
Total	516	/	1219	42%	218	/	1219	18%	462	/	1219	38%
Age												
>=0 and <1	99	/	1219	19%	1	/	218	0%	0	/	1219	0%
>=1 and <5	159	/	1219	31%	100	/	218	46%	112	/	1219	24%
>=5 and <12	244	/	1219	47%	112	/	218	51%	349	/	1219	76%
>=12 and <18	10	/	1219	2%	5	/	218	2%	0	/	1219	0%

In comparison to former year *of years*, more young children (1 year and below) were brought by their mothers for a medical check-up. In addition, more caretakers were accompanying their children to the medical camp than former years.
Of all children seen in the medical camp the last four days, 50% approximately overall 19% was a child of a TPC employee. For details see Appendix B table 1c.

Furthermore, on two days the Tanzanian organisation CCBRT, based in Moshi, joined the medical camp to investigate disabled children. During their visit, CCBRT investigated and questioned handicapped children and their parents. For each child they set up a programme in order to support the children with disabilities and to assist parents. Several children and parents seen at the medical camp for the first time were invited by CCBRT to join a week of intensive training at the CCBRT office in Moshi. CCBRT made appointments for further assessment and surgery (eyes, orthopaedics, neurosurgery). In addition, most children included in the CCBRT outreach programme set up last year were seen by CCBRT to give further follow-up.

During the medical camp in the south part of Mtakuja, two MCC team members visited the Mserekia primary school for lessons in hygiene and tooth brushing in all 7 standards.
Furthermore, in conversations with teachers, parents, translators and (sub)village leaders, we were further informed about live conditions of the community, as (drinking) water access, food (availability), and other factors influencing health. In addition, as part of the carrousel, a food and water inventory for all sub villages was made. The results can be found in Table 15 and 16.

On several days, as part of the medical camp, the dental assistant of TPC hospital, investigated children with caries with pain and referred children to TPC hospital for further investigation and treatment.

On one day at the end of the medical camp eye doctor in training at the KCMC hospital, Chantal Giramahoro, joined the medical camp. All children with eye problems seen during the week of the medical camp, were requested to return to the medical camp. Doctor Giramahoro investigated these children, treated them on location or referred them to KCMC hospital.

It should be noted that FD Kilimanjaro supported the children who were referred to TPC and KCMC hospital financially.

All sub villages of Mtakuja (see Table 1b) are poor rural areas. Mtakuja consists of several sub villages: Mafuriko, Mbeya Kubwa, Remiti, Risavu, Mabatini, Josho and Upareni.

During the week, MCC checked 1219 children. Due to the high risk of mortality and morbidity under five years of age, the focus of MCC is checking young children.
Off all checked children, 99% of the children had the age of twelve years or younger and 40% of the children had the age of five or younger.

Table 1b *Summary of number check-ups per geographical location by age and gender*

LOCATION	Josho		Upareni		Mabatini		Risavu		Mbeya Kubwa		Mafuriko		Remiti		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Total	240		108		151		74		201		319		125		**1219**	
Age																
>=0 and <1	19	8%	6	6%	15	10%	3	4%	20	10%	22	7%	18	16%	105	**9%**
>=1 and <5	78	33%	40	37%	41	27%	21	28%	58	29%	91	29%	45	35%	374	**31%**
>=5 and <12	142	59%	62	57%	93	62%	48	65%	120	60%	199	62%	60	48%	724	**59%**
>=12 and <18	1	0%	0	0%	2	1%	2	3%	3	2%	7	2%	0	0%	15	**1%**
Boy	114	48%	48	45%	79	52%	41	55%	110	55%	171	54%	65	52%	628	**52%**
Girl	126	53%	60	55%	73	48%	33	45%	91	46%	148	46%	60	48%	591	**48%**
School	73	30%	34	31%	51	36%	32	43%	82	40%	122	38%	27	22%	432	**35%**
Non-school	167	70%	74	69%	97	64%	42	57%	119	59%	197	62%	97	78%	796	**65%**

We identified 432 (35%) children who are going to schools with the food program of FD Kilimanjaro (in 2010 :757 (62%)). There might be a bias in these data, since we are not sure if all children identified as school children are actually going to FD Kilimanjaro Food Program School. Of course, these children, called "school" in the presented tables have a school-age

age. Because of age differences they cannot be compared with the whole group of non-school children.
It is noticed that of all checked children 35% went to school. In 2010, a higher number (62%) of the children were school children. Although we saw more children of five years and younger in 2011 when compared to 2010 (479 in 2011 versus 447 in 2010), apparently we saw more children not attending school. The high number of children not attending school needs further investigation and attention by FDK.

Some of the major diagnoses and ailments are presented in table 2.
Most of the ailments, except the dental problems, could be treated on the spot.

We referred 58 children to medical specialists in the TPC Hospital for further diagnoses and/or treatment, 56 children for a blood test after 3 months to TPC Hospital (due to low Hb), and 220 children and/or mothers were tested for HIV.

Furthermore, 33 children were referred to and seen by CCBRT.
In order to support follow-up by FD Kilimanjaro and TPC hospital, lists of children referred to TPC for a medical specialist or blood test after 3 months will be send by MCC to Gerbert Rieks and Harry Mwerinde.
Details on follow-up per geographical location are included in Appendix A.
In addition, details on used medication are given in Appendix B.

Table 2 *Frequency of major diagnoses per geographical location*

Major diagnoses	Anaemia		Deep Anaemia		Dermatomycosis		Pneumonia		Fluorisis		Active worm infection	
	N	%	N	%	N	%	N	%	N	%	N	%
Josho	118/223	53	24/223	11	28/240	12	9/240	4	29/240	4	9/240	4
Upareni	34/100	34	4/100	4	9/107	8	7/107	7	8/107	7	1/107	1
Mabatini	68/136	50	6/136	4	7/151	5	3/151	2	25/151	12	5/151	3
Risavu	21/67	31	5/67	7	7/74	9	1/74	1	9/74	12	0/74	0
Mbeya Kubwa	79/171	46	10/171	6	11/200	6	3/200	2	59/200	30	2/100	1
Mafuriko	142/300	47	24/300	8	13/317	4	10/317	3	103/317	32	4/317	1
Remiti	65/107	61	19/107	18	5/124	4	2/124	2	26/124	21	3/124	2
Total	**527/1105**	**48**	**93/1105**	**8**	**80/1219**	**7**	**36/1219**	**3**	**261/1219**	**21**	**24/1219**	**2**

1: Growth abnormality and malnutrition:
(underweight: 14% (172/1216), stunting: 16% (191/1217), wasting: 6% (53/856))

A recent report of the World Bank shows that one percent decrease in adult height due to childhood stunting correlates with 1.4% loss of productivity. The report shows furthermore the fact that stunting in general is associated with as much as eleven points decrease in Intelligence Quotient (IQ).
Percentages of growth retardation is correlated with poverty, malnutrition, living conditions, hygiene and the prevalence of chronic diseases.
According to UNCCA the two major causes of malnutrition are poor feeding practices and inadequate childcare. Adequate food intake and education programs addressing nutrious food need to be provided.
Malnutrition is thought to account for one third of all deaths of children under five years of age (UN Millennium Developmental Goals).

The World Health Statistics of 2008 shows in Tanzania a prevalence of 21.8 % underweight children and 37.7 % stunted children reflecting chronic malnutrition. Of the people in Tanzania 22% live below the "food poverty line".

The survey of FD Kilimanjaro in the Mtakuja in 2008 showed that 37% of the families live on just one meal a day, 42% get two and 21% get three meals a day. The same survey noted that the typical household's diet is additionally very low in diversity of food products.

MCC assessed growth abnormalities, measuring and weighing all children in a standardized fashion, using the following criteria:

- Underweight = weight for age at or under the third percentile of the reference population (WHO growth curves), only children up to 10 years old. This is an indicator of malnutrition or weight loss because of disease.
- Stunting = height for age at or under the third percentile of the reference population, (WHO growth curves) only children up to 19 years of age. This is an indicator of chronic malnutrition.
- Wasting = weight for height at or under the third percentile of the reference population(WHO growth curves), only children up to 120 cm in height. This is an indicator of acute malnutrition.

Stunting, or 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. Wasting, or 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.
Data on stunting were complete as opposed to underweight and wasting data. However, estimation of age is sometimes troublesome without official documents stating date of birth and children or even parents not knowing children's age, making the stunting data less reliable than wasting data.

It has to be noted that reference data were only available for certain heights, weights and ages (as specified above), leading to the following general prevalence's of growth abnormalities in Mtakutja:

Table 3a *Prevelance of underweight in all children checked in 2009, 2010 and 2011.*

Underweight	Total 2009		Total 2010		Total 2011	
Total	176/1179	**15%**	167/1221	**14%**	172/1216	**14%**
>=0 and <1	14/68	21%	16/81	20%	17/101	17%
>=1 and <5	68/405	17%	62/364	17%	64/374	17%
>=5 and <12	94/706	13%	89/771	12%	91/721	13%

Table 3b *Prevelance of stunting in all children checked in 2009, 2010 and 2011.*

Stunting	Total 2009		Total 2010		Total 2011	
Total	251/1188	**21%**	152/1220	**12%**	191/1217	**16%**
>=0 and <1	24/68	35%	8/81	21%	24/101	24%
>=1 and <5	107/403	27%	78/364	8%	99/374	26%
>=5 and <12	117/711	16%	65/770	10%	66/722	9%

Table 3c *Prevelance of wasting in all children checked in 2009, 2010 and 2011.*

Wasting	Total 2009		Total 2010		Total 2011	
Total	78/860	**9%**	103/752	**14%**	53/856	**6%**
>=0 and <1	9/66	14%	17/80	21%	7/99	7%
>=1 and <5	35/401	9%	52/356	15%	30/373	8%
>=5 and <12	34/393	9%	34/316	11%	16/379	4%

The frequency of underweight, wasting and stunting of all children checked in 2011 are given in table 3a, b and c. In addition, the figures of 2009 and 2010 are added for comparative reasons. In Table 3e, results of the children checked for the first, second and third time are presented.

There are no clear trends seen in growth abnormalities between the groups of checked children in 2009, 2010 and 2011. There is no positive effect seen from the efforts made in de medical camp, or by FDK. However, one should keep in mind that the living conditions, as the

availability of food and drinking water has not improved in the last years and might be deteriorated in the last year and since the age distribution in the three groups of children is not the same (see table 1a), these groups are not comparable without any bias. In the group of children which we checked in 2010 and 2011 more children are in age category one to five years of age. At this age growth disturbances and anaemia is more common.

Table 3e *Prevalence of growth abnormalities in children checked for the first, second or third time in 2011*

	underweight			stunting			wasting		
Number of checks	1	2	3	1	2	3	1	2	3
	15%	16%	13%	16%	22%	13%	7%	4%	6%

Besides the figures of the children checked the first, second or third time, we made individual comparisons of the growth abnormalities seen in 2010 and 2011 (see table 3f). From the data of 2010, the results of the growth data were derived and compared to the data of 2011.
No specific trends were seen from these analyses.

Table 3f *Individual comparison of growth abnormalities in children checked in 2010 and 2011*

	Underweight	Stunting	Wasting
No in 2011 + yes in 2010	6%	4%	4%
Yes in 2011 + yes in 2010	4%	4%	1%
Yes in 2011 + no in 2010	4%	5%	1%
No in 2011 + no in 2010	44%	44%	30%

In table 3g, a comparison was made between the growth abnormalities seen in children attending school and not attending school, data were available from 2009 and 2010.
The children attending a school (most of them with the FD Kilimanjaro food program) did better on all parameters for growth abnormalities.

Table 3g *Prevalence of growth abnormalities in children attending school or not attending school (age >=5 and <12) in 2009, 2010 and 2011*

	underweight			stunting			wasting		
	2009	2010	2011	2009	2010	2011	2009	2010	2011
Attending school	7%	10%	9%	9%	6%	5%	3%	11%	3%
Not attending school	15%	28%	17%	20%	27%	22%	5%	12%	7%

In Table 4a and 4b, details on the growth abnormalities per geographical location are given for 2010. More details on the growth abnomalities can be found in the tables in Appendix A.

Table 4a *Prevalence of underweight, wasting and stunting per geographical location in 2011*

	Underweight				Stunting				Wasting			
	n	/	N	%	n	/	N	%	n	/	N	%
Josho	35	/	240	15%	41	/	240	17%	10	/	170	6%
Upareni	5	/	108	5%	11	/	108	10%	0	/	78	0%
Mabatini	13	/	150	9%	16	/	150	11%	2	/	106	2%
Risavu	5	/	74	7%	10	/	74	14%	2	/	49	4%
Mbeya Kubwa	30	/	200	15%	27	/	200	14%	7	/	142	5%
Mafuriko	55	/	319	17%	66	/	319	21%	13	/	209	6%
Remiti	29	/	124	23%	20	/	125	16%	19	/	101	19%
School	36	/	421	9%	19	/	421	5%	4	/	119	3%
Non-school	136	/	795	17%	172	/	796	22%	49	/	737	7%
Total	**172**	**/**	**1216**	**14%**	**191**	**/**	**1217**	**16%**	**53**	**/**	**856**	**6%**

Table 4b *Prevalence of underweight, wasting and stunting per geographical location in 2010*

	Underweight				Stunting				Wasting			
	n	/	N	%	n	/	N	%	n	/	N	%
Josho	28	/	232	12%	28	/	232	12%	30	/	123	24%
Upareni	14	/	127	11%	13	/	126	10%	9	/	76	12%
Mabatini	11	/	150	7%	11	/	150	7%	7	/	80	9%
Risavu	4	/	68	6%	5	/	68	7%	3	/	38	8%
Mbeya Kubwa	29	/	242	12%	27	/	242	11%	13	/	152	9%
Mafuriko	49	/	310	16%	46	/	310	15%	23	/	208	11%
Remiti	32	/	92	35%	22	/	92	24%	18	/	75	24%
School	73	/	753	10%	50	/	753	7%	34	/	308	11%
Non-school	94	/	468	20%	102	/	467	22%	69	/	444	16%
Total	**167**	**/**	**1221**	**14%**	**152**	**/**	**1220**	**12%**	**103**	**/**	**752**	**14%**

Table 4c *Prevalence of underweight, wasting and stunting per geographical location in 2009*

	Underweight				Stunting				Wasting			
	n	/	N	%	n	/	N	%	n	/	N	%
Josho	54	/	268	20%	56	/	272	21%	27	/	186	9.9%
Upareni	16	/	116	13%	17	/	118	14%	3	/	81	2.5%
Mabatini	16	/	135	12%	21	/	136	15%	7	/	82	5.1%
Risavu	4	/	81	5%	10	/	83	12%	4	/	52	4.8%
Mbeya Kubwa	34	/	293	12%	76	/	294	26%	11	/	229	3.7%
Mafuriko	52	/	285	18%	71	/	284	25%	26	/	229	9.1%
Remiti	-	/	-	-	-	/	-	-	-	/	-	-
School	22	/	321	7%	29	/	321	9%	9	/	321	3%
Non-school	42	/	276	15%	56	/	276	20%	15	/	276	5%
Total	**176**	**/**	**1189**	**15%**	**251**	**/**	**1188**	**21%**	**78**	**/**	**860**	**6.6%**

The Remiti children were not separately identified in 2009, they were allocated at the subvillage Mafuriko. Therefore an overall group comparison could only be made of the incidences in growth abnormalities from the data from last year and this year.
The amount of growth abnormalities in the group of the children of Rimiti (and also in Josho, though in a lesser extent) are alarming and further investigation for the underlying reasons is required.

In comparison of the Tanzania data, with 21.8 % underweight children and 37.7 % stunted children, the population of Mtakutja seems with the prevalence of underweight in 15% and stunting in 21% of the children a little bit better. The children attending a school with the FD Kilimanjaro food program did better on all parameters for growth abnormality with underweight in 6.9 % for school children and 15.2 % for children who attend no or another school, wasting 2.8% versus 5.4% and stunting in 9% versus 20.3%.

During the medical check-ups, we gave all children and their guardians hygiene and nutritional advise, with emphasis on hand-washing, vitamin C and vegetable intake, so their children may grow healthy and strong. We noticed the policy of a lot of mothers to feed their babies up to the age of one year or even more, almost only with breast milk. For babies, we advised exclusive breastfeeding up to six months and then start with the introduction of normal food. For babies without a mother or a mother without enough milk we discussed the possibilities of breastfeeding by another mother. We noticed this policy is quite normal in early days in the hospital but when a baby is at home a lot of fathers are against getting milk from another woman because of culture believes and the fear of being in dept with the husband of the milk giving woman.

2: Anaemia (527, 48 %)
(see table 5, detailed data on anaemia of the medical camp in 2010 are presented in Appendix A).

Anaemia is the most prevalent micronutrient disorder. In Tanzania no national policy has been implemented to provide iron supplements to pregnant women or young children. While iron deficiency is frequently the primary factor contributing to anaemia, it is important to recognise that the control of anaemia requires a multi faceted approach which, through integrative interventions, addresses the various factors that play a significant role in producing anaemia in a given community. In addition to iron deficiency, infectious diseases such as worm infections, other chronic infections, particularly HIV-AIDS and tuberculosis, malaria, as well as other nutritional deficiencies, are especially important.
As pointed out in the paragraph about growth abnormalities, the survey of FD Kilimanjaro in 2008 shows that 37% of the families live on just one meal a day and 42% get only two meals a day. The same survey noted that the typical household's diet is additionally very low in diversity of food products low in fat and low in sources of vitamin C. Maize and some green leafy vegetables dominate the menu on a daily basis; complemented by beans, rice, fish and green bananas on a weekly basis and some meat on a monthly basis.
Due to lack of materials, haemoglobin in children under one year of age was not checked. Iron was given to the mothers of these children and the children aged 6 to 12 months were given multivitamin syrup in addition.

Table 5a *Prevalence of ANAEMIA per GEOGRAPHICAL LOCATION, in 2009, 2010 and 2011*

YEAR	2009				2010				2011			
	Anaemia				Anaemia				Anaemia			
NUMBERS	n	/	N	%	n	/	N	%	n	/	N	%
Total	**445**	**/**	**1172**	**40%**	**449**	**/**	**1211**	**37%**	**527**	**/**	**1105**	**48%**
Josho	98	/	269	36%	110	/	230	48%	118	/	223	53%
Upareni	34	/	117	29%	41	/	125	33%	34	/	100	34%
Mabatini	49	/	136	36%	64	/	150	43%	68	/	136	50%
Risavu	23	/	82	28%	21	/	68	31%	21	/	67	31%
Mbeya Kubwa	138	/	292	47%	82	/	240	34%	79	/	171	46%
Mafuriko	103	/	284	36%	129	/	308	42%	142	/	300	47%
Remiti	-		-	-	52	/	91	57%	65	/	107	61%
Unknown	2	/	1192	0.2%	16	/	1227	1.3%	114	/	1219	9%
School	70	/	321	22%	248	/	746	33%	135	/	419	32%
Non-school	74	/	276	27%	251	/	465	54%	392	/	686	57%

On an individual basis, of all children in 2011, 14% had also an anaemia in 2010. 12% of the children showed an anaemia for the first time (showed no anaemia in 2010). Of all anaemic children of 2010, 8% recovered completely.

Table 5b *Prevalence of children with Hb < 5 per GEOGRAPHICAL LOCATION, in 2009, 2010 and 2011*

YEAR	2009				2010				2011			
	Hb ≤ 5				Hb ≤ 5				Hb ≤ 5			
NUMBERS	n	/	N	%	n	/	N	%	n	/	N	%
Total	**75**	**/**	**1152**	**6%**	**68**	**/**	**1221**	**6%**	**92**	**/**	**1105**	**8%**
Josho	17	/	264	6%	12	/	230	5%	24	/	223	11%
Upareni	3	/	115	3%	1	/	125	1%	4	/	100	4%
Mabatini	9	/	130	7%	5	/	150	3%	6	/	136	4%
Risavu	5	/	78	6%	2	/	68	3%	5	/	67	7%
Mbeya Kubwa	27	/	289	9%	13	/	240	5%	10	/	171	6%
Mafuriko	14	/	275	5%	17	/	308	6%	24	/	300	8%
Remiti	-	/	-	-	18	/	91	20%	19	/	107	18%
School	-	/	-	-	27	/	746	4%	7	/	419	2%
Non-school	-	/	-	-	41	/	465	9%	86	/	686	13%

Anaemia was less prevalent in children attending school (32%) compared with children not attending school with the FD Kilimanjaro food program (57%). This difference most probably reflects the benefits of the school food program, which confirms the importance of nutrition in respect to anaemia and, hence, to health in general. Still, the (growing) amount of anaemic children in the FD Kilimanjaro food program gives rise to re-consider the composition of the food program.
The high incidence of anaemia in Remiti, seen in 2010 and 2011, might be related to differences in eating and drinking habits. This is also reflected in the food inventory made this year (see paragraph 15. The food and drinking water inventory indicates that the children from Remiti drink more milk, eat less meat/fish/duck and drink mainly water from the plantation. The higher incidence of children with an Hb < 5 in Josho could not be explained by the results of the inventory, when comparing the results with the other sub villages. However, a higher incidence of children drinking milk daily is seen in Josho.

We treated the children with anaemia (and their mothers if they were breast fed) with supplements for three months. Of 1219 children, 276 (23%) were given iron tablets or iron syrup, 402 (33%) were given multivitamins. Iron supplements were given to 83 (8%) mothers breast-feeding a child with anaemia. These figures are comparable to the figures of 2010.
In 92 children (8%) the haemoglobin level equals or was less than 5.0 mmol/l (see Table 5). These children were referred to the TPC Hospital for further diagnostic procedures. We asked for a re-check of the haemoglobin level after 3-months, including HIV test, TB and exclusion of sickle cell anaemia (an inborn malformation of the red blood cells). At the time of the writing of the report these results were not yet available, however, re-checks will be planned by FD Kilimanjaro in cooperation with TPC hospital.
As pointed out in the paragraph of growth abnormalities, we gave during the medical check-ups all children and their guardians nutritional advise with emphasis on vegetable intake and vitamin C. When it comes to the prevention of anaemia, the vitamin C intake is important because vitamin C facilitates the uptake of iron in the gut (as milk and tea counterparts it). Cheap and available sources for vitamin C in Tanzania are lemon and passion fruit.

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.

3: Worm treatment (1037 (85%) prophylactic and 48 (4%) therapeutic) (see table 6)
A strong relationship exists between a Helminth, an Ascaris Lumbricoides, a Hookworm or a T. Trichiura infection and anaemia. In the last years a de-worming program was established in Tanzania where there is a high prevalence of these infections in (school-aged) children. This de-worming program doesn't have a 100% coverage.
Of all children, 55% reported receipt of a anti-worm tablet in the last 6 months. It remains unclear whether the tablets given last year for treatment in February 2010, were included in these figures or not.
Despite the de-worming program, we treated the 1011 (83%) children on the spot with Albendazol. An active worm infection was suspected in 21 (2%) children, compared to 48 (4%) in 2010 and 102 (8.6%) children in 2009.
Health education on the spot was aimed at increasing awareness of worm transmission, the disabilities caused by intestinal helminth and the importance of the de-worming program every half year.
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.

Table 6 *Prevalence of prophylactic and therapeutic anti-worm treatment and , in 2009, 2010 and 2011*

	2009				2010				2011			
	n	/	N	%	n	/	N	%	n	/	N	%
Total preventive antiworm treatment	963	/	1190	81%	1037	/	1227	85%	1011	/	1219	83%
Per age category												
>=0 and <1	3	/	68	4%	4	/	81	5%	8	/	105	5%
>=1 and <5	302	/	405	75%	294	/	366	80%	297	/	374	79%
>=5 and <12	652	/	711	92%	734	/	773	95%	692	/	724	96%
>=12 and <18	6	/	6	100%	5	/	6	83%	13	/	15	87%
Probable acute worm infection	106	/	1189	9%	48	/	1227	4%	21	/	1219	2%

4: Pneumonia (in 2011 36 (3%); in 2010 53 (4%); in 2009 69 (6%) (see table 2)
The 36 children with a severe acute respiratory infection (ARI) were treated with appropriate antimicrobials and home treatment advice.
"Pneumonia", "coughing", "fast/difficult breathing", "chest indrawing" and "inability to suck milk" are the key words used by care-takers indicating a (severe) ARI.
For a doctor normally working in Europe it is amazing how few children have asthma in Tanzania. We saw 7 (0.6%) children with symptoms of bronch(iol)tis. None of the children were diagnosed with asthma.
The principles of the Integrated Management of Childhood Illness (IMCI, see www.who.int/child-adolescent-health/integr.htm) (respiratory rate of 50 breaths per minute or more in a baby of 2 months up to 12 months, and 40 breaths per minute or more in a child of 12 months up to 5 years, lower chest wall indrawing and stridor which is a harsh noise made when the child inhales) for recognition and treatment of a pneumonia were transferred to the local workers and care takers.

5: Suspected pathological Cardiac Murmurs (in 2011 3 (0%); in 2010 16 (1.3%); in 2009 23 (1.9%)) (see table 2).
The MCC carrousel includes a cardial examination. We suspected 3 children of having a pathological heart murmur, mainly due to a septal defect. These 3 children were 3, 5 and 7 years old.
Mitral regurgitation and atrial septal defects being the most common heart problems in the third world. For this condition no treatment is available although a good dental situation is essential for a healthy live.
The children and their care takers with the suspected pathological heart murmurs were stressed on teeth brushing procedures. Besides this, they were told and got a written explanation to give their child antibiotics when going to a dentist for a teeth extraction.

6: Stomach ache and other gastrointestinal complaints (see table 7)
During our health checks we encounter a rising percentage of (older) schoolchildren with complaints of stomach pain. In the absence of weight loss, bloating or fever these pains could be stress induced. Pressure on adolescents to succeed academically is well known, alongside with problems at home. Data on milk products sensitivity, gastritis or peptic ulcers are currently lacking as well as the prevalence of Helicobacter pylori bacteria.
Of the 27 children diagnosed with obstipation, 18 were children attending the schools with the FD Kilimanjaro food program. The adding of more fat (sunflower oil for example) and stimulation of more fluid intake (water) can probably solve these complaints.
We also noticed a lot of children who have complains about obstipation/constipation, leg cramps and headaches (no exact data available). These complaints can be due of the habit of drinking too little. We noticed the normal drinking habit of schoolchildren in Tanzania consists of drinking only one or two cups a day while they need at least a litre a day. We explained the children and their care takers how and why they should change their drinking habits.

Table 7 *Prevalence of GASTROINTESTINAL COMPLAINTS in 2010 and 2011*

	2010				2011			
DIAGNOSIS	n	/	N	%	n	/	N	%
Dysenteria	13	/	1227	1%	18	/	1219	1%
Dehydration - acute diarrhoea	3	/	1227	0%	1	/	1219	1%
Diarrhoea without dehydration	3	/	1227	0%	8	/	1219	2%
Obstipation	27	/	1227	2%	27	/	1219	2%

7: Ear-Nose-Throat (ENT) (in 2011: 48 (4%);in 2010: 32; (3%), see table 8)
The prevalence of acute ear infections was comparable with the prevalence in the Netherlands.
Chronic or recurrent ear infections are a common condition encountered by the ENT surgeons in the third world. Effective initiatives for better hygiene and nutrition will play a part in diminishing chronic ear infections and their complications. Treatment of middle ear infections with antibiotics have a big impact in preventing deafness as well.
Three children with hearing problems were referred to a specialist.
One child was referrend to an ENT specialist for a tonsillectomy.

The total incidence of ear-nose-throat complaints in 2011 was slightly higher than in 2010.

Table 8 *Prevalence of EAR-NOSE-THROAT COMPLAINTS in 2010 and 2011*

	2010				2011			
DIAGNOSIS	n	/	N	%	n	/	N	%
Otitis media acuta	3	/	1227	0%	11	/	1219	1%
Otitis media with effusion	9	/	1227	1%	5	/	1219	1%
Otitis externa	7	/	1227	1%	10	/	1219	1%
Tympanic perforation	2	/	1227	0%	2	/	1219	0%
Adenotonsillitis / tonsillitis	8	/	1227	1%	15	/	1219	1%
Candida stomatitis	2	/	1227	0%	3	/	1219	0%
Hearing impairment	1	/	1227	0%	2	/	1219	0%
Total	**32**	**/**	**1227**	**3%**	**48**	**/**	**1219**	**4%**

8: Skin diseases (in 2011: 117; 10%, in 2010: 162; 13% see Table 9)
Among the skin diseases the following disorders are the most common in children in Africa, pyoderma, tinea capitis, scabies, viral skin disorders (mainly moluscum contagiosum) pedicolosis capitis, dermatitis and reactions due to insect bites.
In Mtakuja, we mainly saw dermatomycosis, a skin disease caused by a fungus. Antifungal cream (eventually in combination with hydrocortison) was given for fungal infections and hydrocortison crème was given for different forms of dermatitis.
Scabies is an infective skin disease caused by a mite (Sarcoptes scabiei) and is transmitted in situations of poor hygiene and prolonged physical contact (15 min) with an infected person or contaminated bed sheets or clothing. The female mite burrows just beneath the upper skin layer, producing 0.2 - 0.6 cm long lines on the skin, primarily between and on the fingers, palms, wrists, around nipples (women) and genital areas (men). In severe cases, the mite spreads even to the skin of the belly and sometimes the back. Itching and sometimes secondary infection of scratch lesions are the main symptoms. Chronic severe scabies infection may lead to dark (hyperpigmented) spots on the skin. A scabies infection was seen in six children. Since the best treatment for a severe Scabies infection (Ivermectine) is not available in Tanzania, we brought this from the Netherlands. Health education and hygienic instructions were given to the children and their care takers about scabies.
We saw no lice infection.

The total incidence of skin diseases in 2011 was lower than in 2010.

Table 9 *Prevalence of SKIN DISEASES in 2010 and 2011*

	2010				2011			
DIAGNOSIS	n	/	N	%	n	/	N	%
Wounds n.o.s.	3	/	1227	0%	4	/	1219	0%
Eczema n.o.s.	6	/	1227	0%	4	/	1219	0%
Dermatomycosis	116	/	1227	9%	80	/	1219	7%
Impetigo / furunculosis	12	/	1227	1%	11	/	1219	1%
Scabies	10	/	1227	1%	14	/	1219	1%
Wounds infected	15	/	1227	1%	4	/	1219	0%
Total	**162**	**/**	**1227**	**13%**	**117**	**/**	**1219**	**10%**

9: Eye problems (in 2011: 31; 3%, in 2010: 13; 1%, see table 10)
On one day at the end of the medical camp eye doctor in training at the KCMC hospital, Chantal Giramahoro, joined the medical camp. All children with eye problems seen during the week of the medical camp, were requested to return to the medical camp.

Especially in the group of children above five years of age a rather common complaint was dry and/or painful eyes. Xerophtalmia can be attributed to Vitamin A deficiency. Vitamin A deficiency effect growth, the differentiation of epithelial tissues and immune competence. The most dramatic impact, however is on the eye and includes night blindness, xerosis of the conjunctiva and cornea and ultimately corneal ulceration and necrosis of the cornea. Vitamin A deficiency occurs when body stores are exhausted and supply fails to meet the body's requirements, either because there is a dietary insufficiency, requirements are increased, or intestinal absorption, transport and metabolism are impaired as a result of conditions such as diarrhoea. The most important step in preventing Vitamin A deficiency is insuring that children's diets include adequate amounts of carotene containing cereals, tubers, vegetables and fruits.
Of the 31 children seen with eye problems, 22 children were seen by the eye specialist during the medical camp. If indicated children were given sodium chromoglycate (prednisolone), methylcellulose or chloramphenicol from the MCC pharmacy. Furthermore, some of the children were counselled about allergic conditions. One child with strabismus was referred to CCBRT for further investigations and appointments were made for surgery. One child with a lef eye traumatic cataract was referred to CCBRT.

The total incidence of eye problems in 2011 was higher than in 2010. This was mainly caused by the higher incidence of diagnosed keratoconjunctivitis.

Table 10 *Prevalence of EYE PROBLEMS in 2010 and 2011*

	2010				2011			
DIAGNOSIS	n	/	N	%	n	/	N	%
Refractory problems	3	/	1227	0%	3	/	1219	0%
Strabismus	3	/	1227	0%	1	/	1219	0%
Keratoconjunctivitis	7	/	1227	1%	27	/	1219	2%
Amblyopia	2	/	1227	0%	0	/	1219	0%
Total	**13**	**/**	**1227**	**1%**	**31**	**/**	**1219**	**3%**

10: Urinary tract infections and genital organs (in 2011: 8; 0.7%, in 2010: 5, 0.4 %; see table 11)
We performed 16 urine screening test in the children with urination related complaints. Some protein will appear in the urine if the level of protein in blood becomes high (infections) even when the kidney is functioning properly. Antibiotics, severe emotional stress and strenuous exercise can interfere with the test. In 6 children we found a urine infection which we treated with antibiotics.
We saw one girl with an inguinal hernia, and she was referred to KCMC hospital for surgery. One boy with cryptorchism was seen, he was referred to KCMC hospital.
One child of 15 years with primary enuresis nocturna (urination while asleep)was referred to KCMC (urology) by CCBRT. Another child was referred to KCMC (urology) due to recurrent urinary tract infections.

Table 11 *Prevalence of URINARY TRACT PROBLEMS in 2010 and 2011*

	2010				2011			
DIAGNOSIS	n	/	N	%	n	/	N	%
Epi- / hypospadia	1	/	1227	0%	0	/	1219	0%
Cryptorchism	0	/	1227	0%	1	/	1219	0%
Inguinal hernia	1	/	1227	0%	1	/	1219	0%
Urinary tract infection	3	/	1227	0%	6	/	1219	0%
Total	**5**	**/**	**1227**	**0.4%**	**8**	**/**	**1219**	**0.7%**

11: Dental problems (in 2011: 397, 33%; in 2010: 251; 20%, see table 12)
This Medical Check for Children mission to Tanzania did not include a dentist.
The number of cases mentioned probably underestimate the prevalence of dental disease in the children we checked with severe toothaches and caries.
We had the impression that the more wealthier the people were, the more painful caries we saw. Maybe this is due to the more buying of sweets and cookies when there is more money available.
After the check local volunteers gave out toothbrushes and educate the people in teeth brushing. The TPC dental assistant Pius Tarimo participated in the educational program, and also looked at the children identified with painfull caries. If necessary he referred the children to TPC hospital for further investigation and treatment. In total 23 children were referred to the dentist.

A high incidence of fluorosis was seen (21%). The incidence in fluorosis was not identified in 2010. Fluorosis is most probably due to high concentrations of fluoride in the drinking water. Unfortunately, no analytical data for fluoride are available of the boreholes in Mtakuja.

Excessive ingestion of fluoride during the early childhood years may damage the tooth-forming cells, leading to a defect in the enamel known as dental fluorosis. Teeth impacted by fluorosis have visible discoloration, ranging from white spots to brown and black stains. Teeth with fluorosis also have an increased porosity of the enamel. In the milder forms, the porosity is mostly limited to the sub-surface enamel, whereas in the more advanced forms, the porosity impacts the surface enamel as well, resulting in extensive pitting, chipping, fracturing, and decay of the teeth.

The WHO set a general guideline of 1.5 mg/L concentration of fluoride in drinking water to avoid adverse effects of higher concentrations including severe dental fluorosis and skeletal fluorosis, as these effects were minimal at this concentration or lower (WHO Drinking-water Quality Series, 2006).

At a minimum, the fluoride levels in local water supplies should be monitored and the population should be further examined for signs of excessive fluoride exposure (e.g. moderate and/or severe dental fluorosis). Based on an estimation of the daily intake of drinking water, a risk assessment can be made, and further actions might be considered.

Table 12 *Prevalence of DENTAL PROBLEMS in 2010 and 2011*

	2010				2011			
DIAGNOSIS	n	/	N	%	n	/	N	%
Caries n.o.s.	220	/	1227	18%	121	/	1219	10%
Caries with pain	31	/	1227	3%	15	/	1219	1%
Fluorosis	-		-	-	261	/	1219	21%
Total	**251**	**/**	**1227**	**20%**	**397**	**/**	**1219**	**33%**

– no data

12: Neuromusculair and Skelet problems (see Table 13)
In 2010, CCBRT was introduced to Mtakuja for the children with psychomotoric retardations and skeletal problems. CCBRT started an outreach program in Mtakuja, and 21 children of Mtakuja were included. In 2011 CCBRT was included in the medical camp for two days. CCBRT saw the children already in the program for further advice, but we also referred new children to CCBRT.
As some of the mothers struggle with the daily care of their children, due to the fact that they need to work and take care of the other children, we would promote further investigations for the possibility to set-up day care for the disabled children in Mtakuja.

In 2011 33 children were asked to come to visit CCBRT in the medical camp.
CCBRT

Table 13 Prevalence of NEUROMUSCULAR AND SKELETAL PROBLEMS

DIAGNOSIS	n	/	N	%	n	/	N	%
Psychomotoric retardation	7	/	1227	1%	6	/	1219	0%
Hypertonia	3	/	1227	0%	2	/	1219	0%
Hypotonia	3	/	1227	0%	1	/	1219	0%
Epilepsy	1	/	1227	0%	2	/	1219	0%
Learning difficulties	3	/	1227	0%	1	/	1219	0%
Arltralgia	1	/	1227	0%	1	/	1219	0%
Hip displasia	0	/	1227	0%	1	/	1219	0%

13: HIV-AIDS, TB and malaria
In 2011, Tamari Moses joined the medical camp as a HIV counselar. From the second day of the medical camp it was possible to perform an HIV screening test. Due to the limited number of tests available (approximately 50 a day), caretakers were offered a HIV test (on a voluntary basis). If mothers were tested positive, children were offered a HIV test as well. Furthermore, if MCC doctors diagnosed a child "suspected HIV/Aids", the children (accompanied by caretakers) were offered a screening HIV test.

The diagnosis "suspected HIV/Aids", "possible malaria" and "TB" were either children who told us spontaneously or on request they were on treatment for the disease or the MCC doctor suspected the mentioned disease.

The screening test used, was a rapid antibody test, based on CD4 measurement.
In total 220 tests were performed, from which 13 showed a positive result.
Of the 13 identified positives, 7 were children (6 boys and 1 girl), and 6 were caretakers (all females). The families with a positive HIV test were referred to TPC hospital for further investigation and treatment.

All children with low Hb (<5), were referred to TPC hospital for a re-check in November 2011. These children will all be checked for TB, sickle cell anaemia, HIV and malaria. These re-checks are planned for November 2011, results are not yet available.

14: Education health workers, caretakers and other local helpers:
One of the important tasks of MCC is to encourage the continuation of education of the caretakers and older children. During our week we had teaching sessions on common diagnoses of frequent illnesses and medication. We especially focused on anaemia and malnutrition, on balanced diet, infection, parasites and failure to thrive. Our information mainly consisted of knowledge and practical advice about nutritious food and vitamin supplements, as well as hygienic and health promotion issues.

15: Food and water inventory
Based on the differences seen between the sub villages in 2010, a food and water inventory was made to investigate main food and water sources. All children were asked to respond to questions with regard to the number of meals a day, the frequency of eating

meat/fish/chicken, vegetables and fruit and the frequency of drinking milk. Furthermore, children (or caretakers) were provide information on their water sources for drinking, cooking meals, kitchen cleaning, personal hygiene and for crops.
The results of these inventories are included below.
With regard to the sources of drinking water, it is unknown whether the results of the inventory are biased for the use of water from the canals of the plantation, since it is unknown whether this is allowed for all subvillages. For Remiti, it is known that the villagers discussed the use of the plantation water and they reached an agreement.

Table 14 Food inventory, 2011

Location	Josho %	Upareni %	Mabatini %	Risavu %	Mbeya Kubwa %	Mafuriko %	Remiti %	Total %
Meals a day								
1 meal a day	1	0	0	0	0	0	0	0
2 meals a day	8	0	0	0	11	19	4	9
3 meals a day	92	100	100	100	89	81	96	91
Eating fish/meat/duck								
never	4	0	1	0	12	5	40	8
1 x / week	13	9	42	18	15	22	25	20
> 1 x /week	76	59	55	78	59	68	24	62
every day	8	31	2	4	15	5	10	10
Eating vegetables								
never	1	0	6	1	6	1	2	3
1 x / week	8	33	1	11	14	4	11	10
> 1 x /week	79	49	78	76	38	45	38	55
every day	12	18	14	11	42	50	49	33
Eating fruits								
never	6	0	7	1	5	2	3	4
1 x / week	69	71	47	38	58	60	67	60
> 1 x /week	17	13	44	52	24	30	17	26
every day	8	16	2	8	13	9	13	10
Drinking milk								
never	3	1	6	10	13	24	0	11
1 x / week	57	58	76	56	42	40	4	46
> 1 x /week	4	16	6	22	25	24	0	15
every day	36	26	13	12	20	13	96	28

Table 15 Water source inventory, 2011

Location	Josho %	Upareni %	Mabatini %	Risavu %	Mbeya Kubwa %	Mafuriko %	Remiti %	Total %
Main drinking water source								
Bore hole/water tank	50	5	8	14	0	0	3	11
Canal plantation	0	5	18	8	0	0	96	13
Buying water	50	89	74	78	100	100	1	76
Cooking meals								
Bore hole/water tank	51	5	10	15	0	0	3	11
Canal plantation	0	28	52	19	0	1	97	21
Buying water	49	66	38	66	100	99	0	68
Cleaning dishes/cooking materials								
Bore hole/water tank	9	47	27	30	0	1	3	11
Canal plantation	72	42	71	67	91	91	97	81
Buying water	19	10	1	3	9	8	0	8
Water used for crops/garden								
Bore hole/water tank	1	3	0	3	0	0	3	1
Canal plantation	9	30	22	14	14	27	46	23
No crops/field	90	68	78	83	86	73	51	76
Personal hygiene (e.g. body wash)								
Bore hole/water tank	10	56	17	14	0	1	3	10
Canal plantation	81	38	83	75	96	96	97	86
Buying water	9	5	0	11	4	3	0	4

The following conclusion can be drawn with regard to the food inventory:

- Most of the children of Mtakuja have three meals a day.
- Most of the children eat meat/fish/duck more than 1 time per week, except for the children of Remiti: 40% of the children of Remiti indicated that they never eat meat/fish/duck.
- Approximately half of the children of Mtakuja eat vegetables more than 1 time a week, only 33% eats vegetables daily.
- Most of the children of Mtakuja eat fruits only once a week.
- Approximately 60% eat fruit once a week.
- Most of the children of Mtakuja drink milk once per week milk, except the children of Remiti who drink milk daily. Also a higher incidence of children drinking milk daily is seen in Josho.

Based on the water source inventory, the following conclusions can be drawn:

- A high incidence of use of canals from the plantation as main drinking water source was seen in Remiti, and to a lesser extend in Mabatini.
- The other subvillages mainly buy their drinking water.
- Also the children of Remiti and Mabatini use water of the canals for cooking as the other subvillages mainly buy water for this purpose.
- Most villagers use water from the canals for cleaning purposes (kitchen materials) and for personal hygiene (body wash).
- Most villagers do not have a private garden for crops, except for the subvillages Remiti where almost half of the people have their own crops.
- Most of the children from Remiti use mainly the canal as their drinking water source and for other purposes. Considering the results of the medical camp, the high indicence of anaemia in the Remiti children, the quality of this drinking water source needs further investigation, or an alternative good drinking water source should be offered.
- Although in Remiti a high incidence of private crops were grown, children's health seems not to benefit. Maybe it is to early to draw conclusions, since last these gardens were not noticed. In addition, the quality of the water used in the gardens might need further investigation.
- Mainly the people from Remiti showed different eating habbits when compared to the other subvillages. Although we would not advice to aim at changing their cultural life, we would suggest specific dietary training and advice.

General conclusions

- Knowledge of the parents and children of hygiene, tooth brushing and healthy food seems improved. Based on the conversations with the caretakers, we noticed that the information on hygiene and food shared with them in the past years was still present. The overall hygiene was better and most of the children are brushing their teeth at least twice a day. Less acute infections were seen in 2011 when compared to 2010 and 2009, partly due to better hygiene and part due to the anti-worm treatment given by MCC last year and the Governmental program.
- Although less acute worm infections were seen, it should be emphasized that an deworming program covering all children of at least 2 years and above the should be set up, since the governmental deworming program did not reach the whole group. A school based deworming program should be considered.
- The people in Mtakuja need more safe water for drinking and hygiene purposes. We noticed that the water supply to schoolchildren is not improved since 2009. At this moment both schools are lacking a close-by clean water source. Considering the high number of children at the schools with no possibility for washing their hands and cleaning the toilets, there is a high risk for the health of the children.
- Although lots of efforts are taken to get more safe water sources in Mtakuja, still a high number of people are lacking close-by safe (drinking) water sources. We emphasize that in order to fight the health problems of children, there is a need for safe water.

The quality and safety of available water sources (boreholes, canals, plantation) for drinking, washing, cooking and gardening is unknown and needs further investigation. Furthermore, we recommend investigation of the currently available drinking water, with special emphasis on the content of Fluor because a high prevalence of children with fluorosis was noted at a high incidence in some of the subvillages (Mbeya Kubwa, Mafuriko and Remiti).

- Due to the dryness and increased costs for vegetables and fruits, it is difficult for caretakers to have good vitamin and iron sources in their daily food. Although lots of people will benefit from the farming project, setting up home gardening for woman in some of the sub villages might be encouraged, e.g. by water sources.
- We encourage the initiative of the prevention clinic in Mtakuja and the appointment of community health workers. Based on the results of the medical camp, the community health workers should be further trained.
- There is a strong need for a health education program for pregnant woman and young mothers with special attention for breastfeeding and good motherhood.
- There is a need to find a method for keeping relevant information with the child (like the need of antibiotics before dental extraction in children with a cardial septal defect).
- We recommend FD Kilimanjaro the addition of more fat, fibers (e.g. fruit and vegetables) and a vitamin C source to the school food program. In times of lack of affordable vitamin sources, one might consider artificial vitamin addition to the school lunch, or providing vitamin tablets at school. We recommend a shorter time of cooking the available vegetables so the nutrious parts of the food will remain. It should be investigated if more nutritious corn flour can be used, instead of the corn grain without grain peel (with peel contains more vitamins, but is not tasty).
- We recommend further investigations of the higher incidence of chronic health problems seen in Remiti and Josho (e.g. anemia and underweight) when compared to the other villages. Sub-village specific health improving activities should be set up.
- We recommend to further support the social program set up by Stella Msarikie of FD Kilimanjaro. Possibilities for setting up a day care for disabled children should be further investigated in close cooperation with CCBRT.

Last words:

Our third trip to Mtakuja has been again a wonderful experience in our lives and in the lives of the team members. To come for the third time, seeing the translators still included in the medical camp with all their enthusiasm is heart warming. Witnessing the evolution of the programs and the development of local expertise is exciting. It is stimulating to work with team members and local translators from different background, exchanging ideas and to learn from each other.

Our special personal thanks goes to Gerbert Rieks and Stella Mserikie from FD Kilimanjaro, who organised the medical camp in close cooperation with MCC. We also would like to thank all translators, CCBRT, TPC hospital, and KCMC hospital for their cooperation and enthusiasm. We would love to work together with them next year.

It was a joy working together with a team of almost thirty people for the third year, with the same group of people which became friends during those years. Although we saw improvements, we are also aware of the harsh conditions of the live in Mtakuja and the lack of rain for already a long time.

We hope to return to Tanzania next year to see the improvements of the program in Mtakutja and work together again with all the people who put their time and energy in creating a better world for all of us.

We are looking forward to return to the children of Mtakuja in 2012!

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Amsterdam, 19 November 2011