Introduction

From March 19th untill March 26th, a Medical Checks for Children (MCC) team visited Nairobi and Njeri in Kenia. Free of cost, the MCC team checked and treated 1064 children aged newborn untill 14 years of age.

The team consisted Karlien Bongers, medical-end-responsible and mission leader, general surgeon; Nadine van Dijk, organization-end-responsible, emergency doctor; Naomi Ketharanathan, pediatrician in training; Gijs Baaten, family doctor; Irene ter Steeg, rehabilitoin doctor in training; Jankina Ligtvoet-Groenwold, pediatric nurse; Dave Lemstra, nurse; Henny van der Zwaag, secretary; Hans van Loon, consultant for children with special needs and Vincent Engelen, carpenter.

After a explorative mission in August 2008 and a MCC mision in March 2009 and 2010, a MMC team visited Nairobi for the fourth time.

Our host patron durning the Kenia stay was Archbishop Makarios, Head of the Orthodox Seminary in Riruta, Nairobi.

Again, the medical checks were organized in close cooperation with the Sophia Foundation for Children (SFFC) (www.sophia-foundation.com).

Technical equipment and some of the supplies were brought from Europe by the MCC team members. Most of the medication was ordered through SFFC in Kenia. Additional local medication was purchased from the main pharmacy in Nairobi.

The cooperation of the Sophia Foundation for Children and the Archbishop Makarios existed out of the following (amongst others):

- Transfer of knowledge about expected diseases, through their earlier work in Kenia.
- Transfer of data on demographics.
- Selection of primary schools and orphanages.
- Providing facilitating board and lodging of all MCC team members.
- Transportation of the MCC team from the airport and transportation to the check locations.
- Prior announcement of the medical camp in the locations.
- Ordering and delivery of medications.
- Giving support to the MCC team during the medical camp.
- Managing facilitating and (pre)-payment of hospital in/out patient referrals (Riruta Clinic and Coptic Hospital in Nairobi.

The MCC team was delighted by the cooperation with Archbishop Makarios and the strong input of the Sophia Foundation for Children. Our special thanks go to Marina Shakola, Nopi Nicolaou and Matheos Demetriades. Their pro-active, direct support and enthusiasm gave MCC the opportunity to work in Kenia and they facilitated all aspects of the medical camp. We also thanks Eleni Kapsou for joining the team.

Special thanks go to the translators and teachers. We enjoyed working together with all the local helpers. 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 child health & hygiene.

We are grateful to all the 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.

And last but not least, we would like to thank the children and their care-takers who came to the checks for their inspiring presence.

Medical Checks for Children on location:

The medical checks of the children were performed on seven days at different locations.

St.Pauls school, St.Nicholas school, Riruta school and St.George school in Kibera are all supported by the Archbishop Makarios of the Greek Orthodox Church in Africa.

At the St.George school, the Sophia Foundation for Children (SFFC) started a feeding program in 2009. The Joy Spring school in Kibera is not structual supported by any organisation, though they were recently involved in an deworming program of the World Health Organisation (WHO). The "Kibera children" just came to the medical camp to ask for a medical check. Most of them had a specific medical problem or complain. In Navaisha we saw the vulnerable children of whom the local organisation called Monica Memorial Development Centre for Needed Children (Mmemo) takes care for. The organisation depends on financial gifts of the local church.
In Njeri the MCC team checked the children from the Makarios Children Home supported by the Sophia Foundation for Children and children attending the local school.
At the Waithaka Special School for Mentally Handicapped Children in the neighbourhood called Kirigu, mental handicapped and/or disabled children live together with blind and deaf children. The living circumstances are extremely poor though they receive loving tender care.

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, 67% of the children had the age of ten years or younger and 21% of the children had the age of five or younger. The age of the checked children was different at the different locations due to the setting (Kindergarten, school age, supporting vulnerable children). The total amount of checked boys-girls was the same although at some locations the percentage's of checked boy's and girls were not equally divided.

Table 1: Number, age and gender distribution of the 1064 checked children at the different locations

LOCATION	St. Paul		Waithaka		Naivasha		St. Nicholas		St. George	
	N	%	N	%	N	%	N	%	N	%
Total	72	100%	74	100%	123	100%	60	100%	122	100%
Age										
>=0 and <1	0	0%	0	0%	2	2%	2	3%	1	1%
>=1 and <5	15	21%	0	0%	17	14%	41	68%	59	48%
>=5 and <12	55	76%	24	32%	82	67%	17	28%	62	51%
>=12 and <18	2	3%	36	49%	22	18%	0	0%	0	0%
Boy	35	49%	42	57%	79	64%	35	58%	58	48%
Girl	37	51%	32	43%	44	36%	25	42%	64	52%

LOCATION	Kibera		Joy Springs		Makarios Home		Nyeri *		Total	
	N	%	N	%	N	%	N	%	N	%
Total	30	100%	383	100%	81	100%	118	100%	**1064**	**100%**
Age										
>=0 and <1	3	10%	3	1%	0	0%	5	4%	**16**	**2%**
>=1 and <5	14	47%	63	16%	6	7%	20	17%	**235**	**22%**
>=5 and <12	12	40%	273	71%	30	37%	63	53%	**618**	**58%**
>=12 and <18	1	3%	44	11%	45	56%	30	25%	**180**	**17%**
Boy	18	60%	184	48%	41	51%	52	44%	**544**	**51%**
Girl	12	40%	199	52%	40	49%	66	56%	**519**	**49%**

*The data of Nyeri School/village include 101 children of the Nyeri School and 17 children of Nyeri village.

During the medical checks, the children were checked following the MCC carrousel:

1. Registration of the child
2. Measuring height and weight
3. Blood test for haemoglobin
4. Physical examination
5. Giving medication and education about the correct use of it (pharmacy)
6. Education on tooth brushing
   (a tooth brush was given to each child), and hand washing.

Data collection

Anthropometric measurements were recorded, and a finger prick sample was taken for determination of the haemoglobin (Hb) concentration. Each child was examined by a Medical Doctor. History of illnesses in the preceding four weeks was recorded. Specifically, caretakers were asked if the child had diarrhoea, an upper respiratory infection, vomiting, eating soil (pica), decreased appetite and weight loss.
They were also asked if their child received treatment for any of these, and if so, from where. The data of the children were analysed through the MCC data base.

Diagnosis and categories of ailments:

During the week, MCC checked 1064 children. The overall health and nutritional status of the children was moderately poor, with 10 %of stunting and 32% of anaemia.
Most of the ailments, except the dental problems, could be treated on the spot.
For more detailed information on all diagnoses see table 1 of the appendix. For treatment given during the medical camp see table 17 of the appendix.

Table 2: Prevalence of selected diagnosis per GEOGRAPHICAL LOCATION

LOCATION	St. Paul			Waithaka			Naivasha			St. Nicholas			St. George		
	n / N		%	n / N		%	n / N		%	n / N		%	n / N		%
Pneumonia (clinical diagnosis)	2 / 72		3%	1 / 74		1%	4 / 123		3%	3 / 60		**5%**	3 / 122		2%
Diarrhoea	0 / 72		0%	0 / 74		0%	1 / 123		1%	0 / 60		0%	6 / 122		5%
Obstipation	5 / 72		7%	0 / 74		0%	17 / 123		**14%**	5 / 60		8%	8 / 122		7%
Caries n.o.s.	11 / 72		15%	29 / 74		**39%**	39 / 123		**32%**	7 / 60		12%	19 / 122		16%
Fluorosis	1 / 72		1%	0 / 74		0%	31 / 123		**25%**	1 / 60		2%	3 / 122		2%
Caries with pain	8 / 72		11%	1 / 74		1%	9 / 123		7%	2 / 60		3%	7 / 122		6%
Dermatomycosis	0 / 72		0%	1 / 74		1%	2 / 123		2%	3 / 60		5%	8 / 122		7%
Psychomotoric retardation	0 / 72		0%	61 / 74		82%	0 / 123		0%	0 / 60		0%	0 / 122		0%
LOCATION	Kibera			Joy Springs			Makarios Home			Nyeri			Total		
	n / N		%	n / N		%	n / N		%	n / N		%	n / N		%
Pneumonia (clinical diagnosis)	2 / 30		**7%**	5 / 383		1%	2 / 81		2%	5 / 118		4%	27 / 1064		**3%**
Diarrhoea	4 / 30		13%	8 / 383		2%	0 / 81			2 / 118		2%	21 / 1064		**2%**
Obstipation	7 / 30		**23%**	16 / 383		4%	1 / 81		1%	3 / 118		3%	62 / 1064		**6%**
Caries n.o.s.	1 / 30		3%	68 / 383		18%	24 / 81		**30%**	18 / 118		15%	216 / 1064		**20%**
Fluorosis	0 / 30			10 / 383		3%	4 / 81		5%	2 / 118		2%	52 / 1064		**5%**
Caries with pain	4 / 30		13%	31 / 383		8%	1 / 81		1%	3 / 118		3%	66 / 1064		**6%**
Dermatomycosis	1 / 30		3%	7 / 383		2%	3 / 81		4%	8 / 118		7%	33 / 1064		**3%**

1: Growth abnormality and malnutrition:

(underweight: 6% (45/1799), stunting: 10% (111/1062), wasting: 4% (23/577))

Malnutrition has been related to poor cognitive and school performance. There is strong evidence to suggest that malnutrition places children under the age of 5 at increased risk for mortality. Malnutrition is thought to account for one third of all deaths of children under five years of age (UN Millennium Developmental Goals).
Percentages of growth retardation is correlated with poverty, malnutrition, living conditions, hygiene and the prevalence of chronic diseases.
The major causes of malnutrition are poor feeding practices and or lack of food inadequate childcare. Adequate food intake and education programs addressing nutrious food need to be provided.
Therefore, we 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.

It has to be noted that reference data are only available for certain heights, weights and ages (as specified above), leading to the general prevalence's of growth abnormalities of being underweight 4%, stunting 10 % and wasting 2 %

Table 3: Prevalence of Weight/age (Underweight) under P3 per GEOGRAPHICAL LOCATION by AGE and GENDER

LOCATION	St. Paul			Waithaka			Naivasha			St. Nicholas			St. George		
	n / N	%		n / N	%		n / N	%		n / N	%		n / N	%	
Total	3 / 71	4%		1 / 20	5%		15 / 89	17%		2 / 60	3%		5 / 122	4%	
not possible	1 / 72	1%		54 / 74	73%		34 / 123	28%		0 / 60	0%		0 / 122	0%	
age category															
>=0 and <1	0 / 0	n.a.		0 / 0	n.a.		0 / 2	0%		0 / 2	0%		0 / 1	0%	
>=1 and <5	0 / 15	0%		0 / 0	n.a.		0 / 17	0%		0 / 41	0%		1 / 59	2%	
>=5 and <12	3 / 55	5%		1 / 20	5%		15 / 70	21%		2 / 17	12%		4 / 62	6%	
>=12 and <18	0 / 1	0%		0 / 0	n.a.		0 / 0	n.a.		0 / 0	n.a.		0 / 0	n.a.	
Boy	1 / 34	3%		1 / 12	8%		7 / 51	14%		1 / 35	3%		3 / 58	5%	
Girl	2 / 37	5%		0 / 8	0%		8 / 38	21%		1 / 25	4%		2 / 64	3%	

LOCATION	Kibera			Joy Springs			Makarios Home			Nyeri			Total		
	n / N	%		n / N	%		n / N	%		n / N	%		n / N	%	
Total	1 / 29	3%		9 / 293	3%		3 / 31	10%		6 / 83	7%		45 / 799	**6%**	
not possible	1 / 30	3%		90 / 383	23%		50 / 81	62%		35 / 118	30%		265 / 1064	25%	
age category															
>=0 and <1	0 / 3	0%		0 / 3	0%		0 / 0	n.a.		0 / 4	0%		0 / 16	**0%**	
>=1 and <5	0 / 14	0%		2 / 63	3%		0 / 6	0%		1 / 20	5%		4 / 235	**2%**	
>=5 and <12	1 / 12	8%		7 / 226	3%		3 / 25	12%		5 / 57	9%		41 / 544	**8%**	
>=12 and <18	0 / 0	n.a.		0 / 1	0%		0 / 0	n.a.		0 / 1	0%		0 / 3	**0%**	
Boy	1 / 17	6%		3 / 140	2%		1 / 21	5%		2 / 39	5%		20 / 407	**5%**	
Girl	0 / 12	0%		6 / 153	4%		2 / 10	20%		4 / 44	9%		25 / 391	**6%**	

Table 4: Prevalence of Height/age (Stunting) at or under P3 per GEOGRAPHICAL LOCATION by AGE and GENDER

LOCATION	St. Paul			Waithaka			Naivasha			St. Nicholas			St. George		
	n / N		%	n / N		%	n / N		%	n / N		%	n / N		%
Total	1 / 72		1%	18 / 73		**25%**	24 / 122		**20%**	3 / 60		5%	15 / 122		12%
not possible	0 / 72		0%	1 / 74		1%	1 / 123		1%	0 / 60		0%	0 / 122		0%
age category															
>=0 and <1	0 / 0		n.a.	0 / 0		n.a.	1 / 2		50%	0 / 2		0%	0 / 1		0%
>=1 and <5	0 / 15		0%	0 / 0		n.a.	2 / 17		12%	0 / 41		0%	10 / 59		17%
>=5 and <12	1 / 55		2%	3 / 24		13%	11 / 81		14%	3 / 17		18%	5 / 62		8%
>=12 and <18	0 / 2		0%	12 / 35		34%	10 / 22		45%	0 / 0		n.a.	0 / 0		n.a.
Boy	1 / 35		3%	14 / 42		33%	18 / 78		23%	2 / 35		6%	8 / 58		14%
Girl	0 / 37		0%	4 / 31		13%	6 / 44		14%	1 / 25		4%	7 / 64		11%
LOCATION	**Kibera**			**Joy Springs**			**Makarios Home**			**Nyeri**			**Total**		
	n / N		%	n / N		%	n / N		%	n / N		%	n / N		%
Total	3 / 30		10%	24 / 383		6%	14 / 81		**17%**	9 / 118		8%	111 / 1062		**10%**
not possible	0 / 30		0%	0 / 383		0%	0 / 81		0%	0 / 118		0%	2 / 1064		0%
age category															
>=0 and <1	0 / 3		0%	0 / 3		0%	0 / 0		n.a.	0 / 4		0%	1 / 16		**6%**
>=1 and <5	2 / 14		14%	7 / 63		11%	0 / 6		0%	3 / 20		15%	24 / 235		**10%**
>=5 and <12	1 / 12		8%	13 / 273		5%	4 / 30		13%	3 / 63		5%	44 / 617		**7%**
>=12 and <18	0 / 1		0%	4 / 44		9%	10 / 45		22%	3 / 30		10%	39 / 179		**22%**
Boy	2 / 18		11%	14 / 184		8%	10 / 41		24%	6 / 52		12%	75 / 543		**14%**
Girl	1 / 12		8%	10 / 199		5%	4 / 40		10%	3 / 66		5%	36 / 518		**7%**

Table 5 : Prevalence of Weight/height (Wasting) at or under P3 per GEOGRAPHICAL LOCATION by AGE and GENDER

LOCATION	St. Paul			Waithaka			Naivasha			St. Nicholas			St. George		
	n / N		%	n / N		%	n / N		%	n / N		%	n / N		%
Total	1 / 71		1%	2 / 11		**18%**	4 / 68		6%	1 / 60		2%	4 / 115		3%
not possible	1 / 72		1%	63 / 74		85%	55 / 123		45%	0 / 60		0%	7 / 122		6%
age category															
>=0 and <1	0 / 0		n.a.	0 / 0		n.a.	0 / 2		0%	0 / 2		0%	0 / 1		0%
>=1 and <5	0 / 15		0%	0 / 0		n.a.	0 / 17		0%	0 / 41		0%	1 / 59		2%
>=5 and <12	1 / 55		2%	2 / 11		18%	4 / 47		9%	1 / 17		6%	3 / 55		5%
>=12 and <18	0 / 1		0%	0 / 0		n.a.	0 / 2		0%	0 / 0		n.a.	0 / 0		n.a.
Boy	1 / 34		3%	2 / 7		29%	0 / 40		0%	0 / 35		0%	1 / 57		2%
Girl	0 / 37		0%	0 / 4		0%	4 / 28		14%	1 / 25		4%	3 / 58		5%
LOCATION	**Kibera**			**Joy Springs**			**Makarios Home**			**Nyeri**			**Total**		
	n / N		%	n / N		%	n / N		%	n / N		%	n / N		%
Total	0 / 22		0%	4 / 160		3%	1 / 15		7%	6 / 54		**11%**	23 / 577		**4%**
not possible	8 / 30		27%	223 / 383		58%	66 / 81		81%	64 / 118		54%	487 / 1064		46%
age category															
>=0 and <1	0 / 3		0%	0 / 3		0%	0 / 0		n.a.	0 / 4		0%	0 / 16		**0%**
>=1 and <5	0 / 14		0%	1 / 62		2%	0 / 6		0%	1 / 20		5%	3 / 234		**1%**
>=5 and <12	0 / 5		0%	3 / 95		3%	1 / 9		11%	5 / 29		**17%**	20 / 323		**6%**
>=12 and <18	0 / 0		n.a.	0 / 0		n.a.	0 / 0		n.a.	0 / 0		n.a.	0 / 3		**0%**
Boy	0 / 15		0%	1 / 78		1%	1 / 10		10%	0 / 24		0%	6 / 300		**2%**
Girl	0 / 7		0%	3 / 82		4%	0 / 5		0%	6 / 30		20%	17 / 276		**6%**

Analysis of the nutritional status shows significant differences among the locations visited. Within the children assessed, it is unknown how many children have HIV related weight loss (wasting syndrome).

The children in Naivasha showed a high prevalence of growth abnormalities (underweight 17%, stunting 20%, wasting 6%) and malnutrition mirroring the resource poor setting with lots of sick children. The higher prevalence of growth abnormalities in the children of Waithaka Special School for Mentally Handicapped Children (stunting 25%, wasting 18%) represents the poor living conditions of these children and the underlying medical conditions. Only a limited

number of data are available for underweight, since underweight cannot be scored for children above 10 years of age.
Overall, the children in Nairobi supported by the Archbishop Makarios of the Greek Orthodox Church in Africa and the Sophia Foundation for Children (SFFC) had a lower prevalence of growth abnormalities then the children they did not support. The prevalence of growth abnormalities in Makarios Home is a refelection of the selection of children living in Nyeri orphage (orphans, streetchildren, children from prison, children with AIDS etcetera)

We analysed the children who had had a medical check in 2009 and 2010. In comparison with the group of children of 2011, the group of children who had two checks showed less growth abnormalties.

Table 6: prevelace of growth abnormalities in all children checked in 2011, in children checked in 2010 for the second time and in children checked in 2010 for the first time.

	underweight			**stunting**			**wasting**		
	2010	2009 & 2010	total 2011	2010	2009 & 2010	total 2011	2010	2009 & 2010	total 2011
total	7%	3%	**6%**	11%	8%	**10%**	4%	1%	**4%**
age category									
>=0 and <1	6%	-	**0%**	11%	-	**6%**	0%	0%	**0%**
>=1 and <5	6%	0%	**2%**	10%	7%	**10%**	3%	0%	**1%**
>=5 and <12	7%	4%	**8%**	7%	6%	**7%**	4%	1%	**6%**

During the medical check-ups of this year, we paid again attention to issues of hygiene and nutritional advise. We emphasised on hand-washing, vitamin C, fruit and vegetable intake, so the children may grow healthy and strong. We noticed the policy of mothers to feed their babies up to the age of one year or even more, sourly only with breast milk. For babies, we advised exclusive breastfeeding up to six months and then start with the introduction of additional foods.
We are aware of the financial problems and, because of draught, scarcity of healthy food for many families. This is one the strongest arguments of MCC to link up and cooperate with other organisations, like SFFC, facilitating/paying for school lunches.

2: Anaemia:
In 31 % of all checked children were diagnosed with anemia. We treated the children with anaemia (and their mothers if they were breast fed) with supplements for three months (24% iron, 18% multivatimins).
If we suspected a vitamin deficiet and/or a infection we gave multivitamins instead of iron supplements. (table 2 appendix). The amount of given multivitamins instead of iron is a refelection of the impaired health situation of the children of Waitkaka, Kibera and Navaisha.

In 14 children (12/1064,1%) the haemoglobin level was less than 5.0 mmol/l. Three of these children were referred to the Sophia Foundation for clinical treatment. We asked for a re-check of the haemoglobin level in 3 months for the other 8 children.

Table 7: Prevalence of ANAEMIA per GEOGRAPHICAL LOCATION by AGE and GENDER

LOCATION	St. Paul			Waithaka			Naivasha			St. Nicholas			St. George		
	n / N		%	n / N		%	n / N		%	n / N		%	n / N		%
Total anaemia	16 / 72		22%	18 / 71		25%	19 / 123		15%	19 / 60		32%	68 / 122		**56%**
Hb unknown	0 / 72		0%	3 / 74		4,1%	0 / 123		0%	0 / 60		0%	0 / 122		0%
age category															
>=0 and <1	0 / 0		n.a.	0 / 0		n.a.	1 / 2		50%	1 / 2		50%	1 / 1		100%
>=1 and <5	3 / 15		20%	0 / 0		n.a.	4 / 17		24%	13 / 41		32%	33 / 59		56%
>=5 and <12	13 / 55		24%	5 / 24		21%	11 / 82		13%	5 / 17		29%	34 / 62		55%
>=12 and <18	0 / 2		0%	10 / 33		30%	3 / 22		14%	0 / 0		n.a.	0 / 0		n.a.
Boy	11 / 35		31%	11 / 42		26%	12 / 79		15%	12 / 35		34%	35 / 58		60%
Girl	5 / 37		14%	7 / 29		24%	7 / 44		16%	7 / 25		28%	33 / 64		52%
LOCATION	Kibera			Joy Springs			Makarios Home			Nyeri			Total		
	n / N		%	n / N		%	n / N		%	n / N		%	n / N		%
Total anaemia	16 / 30		**53%**	112 / 379		30%	22 / 79		28%	32 / 117		27%	322 / 1054		**31%**
Hb unknown	0 / 30		0%	4 / 383		1%	2 / 81		2,5%	1 / 118		0,8%	10 / 1064		0,9%
age category															
>=0 and <1	1 / 3		33%	0 / 3		0%	0 / 0		n.a.	1 / 5		20%	5 / 16		**31%**
>=1 and <5	9 / 14		64%	19 / 62		31%	3 / 6		50%	11 / 20		55%	95 / 234		**41%**
>=5 and <12	6 / 12		50%	82 / 270		30%	11 / 30		37%	13 / 62		21%	180 / 614		**29%**
>=12 and <18	0 / 1		0%	11 / 44		25%	8 / 43		19%	7 / 30		23%	39 / 175		**22%**
Boy	10 / 18		56%	55 / 183		30%	15 / 41		37%	12 / 51		24%	173 / 542		**32%**
Girl	6 / 12		50%	57 / 196		29%	7 / 38		18%	20 / 66		30%	149 / 511		**29%**

Table 8: prevelace of anaemia in children checked in 2010 for the second time and in all children checked in 2011

	2009 & 2010	total 2011
total	20%	31%
age categorie		
>=1 and <5	11%	41%
>=5 and <12	22%	29%
>=12 and <18	21%	22%

Anaemia is the most prevalent micronutrient disorder in the world.
In Kenia no national policy has been implemented so far 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, as well as other nutritional deficiencies, and as side effects of ART medication in HIV positive children.
It is unknown how many children with abdominal problems have iron deficiency anaemia and a coexisting H. pylori infection. From literature it is known that one should suspect an infection with H. pylori when the iron deficiency anaemia is refractory to iron administration.

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 counterparts it). Cheap and available sources for vitamin C in Kenia are lemon and passion fruit.
For babies, we advised exclusive breastfeeding up to six months, then start with the introduction of additional foods. Seven mothers of breastfed, anaemic babies were treated with iron supplementation for 3 months.

In St George school the food program was very effective treating protein-energy malnutrition, but less successful to iron deficient anaemia. The micronutrient deficiency should be addressed through close evaluation of the food-based strategy, especially dietary

diversification, possibly through home gardens or provision of 'sprinkles' containing multiple micronutrients to be mixed with food.

3: Worm treatment: (prophylactic 51%, 544/1064; therapeutic 1.5%, 16/1064)
A strong relationship exists between a Helminth, an Ascaris Lumbricoides, a Hookworm, a Taenia Trichiura or Saginata (tapeworm) infection and anaemia. In studies Ascaris prevalence percentage is 19.3% and hookworm 7.6%. The incidence/prevalence of Taenia Saginata (tape worm) is not known.

Table 9: Frequency of handing out Preventive antiworm treatment per GEOGRAPHICAL LOCATION by AGE and GENDER

LOCATION	St. Paul				Waithaka				Naivasha				St. Nicholas				St. George			
	n	/	N	%	n	/	N	%	n	/	N	%	n	/	N	%	n	/	N	%
Total	70	/	72	**97%**	58	/	74	**78%**	114	/	123	**93%**	56	/	60	**93%**	108	/	122	**89%**
age category																				
>=0 and <1	0	/	0	n.a.	0	/	0	n.a.	0	/	2	0%	0	/	2	0%	1	/	1	100%
>=1 and <5	14	/	15	93%	0	/	0	n.a.	17	/	17	100%	40	/	41	98%	51	/	59	86%
>=5 and <12	54	/	55	98%	23	/	24	96%	76	/	82	93%	16	/	17	94%	56	/	62	90%
>=12 and <18	2	/	2	100%	30	/	36	83%	21	/	22	95%	0	/	0	n.a.	0	/	0	n.a.
Boy	35	/	35	100%	34	/	42	81%	75	/	79	95%	33	/	35	94%	52	/	58	90%
Girl	35	/	37	95%	24	/	32	75%	39	/	44	89%	23	/	25	92%	56	/	64	88%
LOCATION	**Kibera**				**Joy Springs**				**Makarios Home**				**Nyeri**				**Total**			
	n	/	N	%	n	/	N	%	n	/	N	%	n	/	N	%	n	/	N	%
Total	16	/	30	53%	13	/	383	3%	11	/	81	14%	98	/	118	**83%**	544	/	1064	**51%**
age category																				
>=0 and <1	0	/	3	0%	0	/	3	0%	0	/	0	n.a.	0	/	5	0%	1	/	16	**6%**
>=1 and <5	9	/	14	64%	7	/	63	11%	0	/	6	0%	14	/	20	70%	152	/	235	**65%**
>=5 and <12	6	/	12	50%	6	/	273	2%	4	/	30	13%	58	/	63	92%	299	/	618	**48%**
>=12 and <18	1	/	1	100%	0	/	44	0%	7	/	45	16%	26	/	30	87%	87	/	180	**48%**
Boy	8	/	18	44%	5	/	184	3%	5	/	41	12%	44	/	52	85%	291	/	544	**53%**
Girl	8	/	12	67%	8	/	199	4%	6	/	40	15%	54	/	66	82%	253	/	519	**49%**

In the last years a de-worming program was established in Kenia where there is a high prevalence of these infections in (school-aged) children yet.
Official data show a coverage of this de-worming program of 80%. Table 9 shows the frequency of worm treattment of the children checked in this years mission in the last six months (51% on average).

We treated children who were not in a de-worming program and/or an active worm infection was suspected with Albendazol on the spot. Anamnestic information gave us the suspicion of a high prevalence of Taenia Saginata (tape worm) infection. Tape worm can not be treated by Albendazol/Mebendazol. The for this treatment needed niclosamide was not available at the time of the medical checks.

Health education on the spot was aimed at increasing awareness of worm transmission, the divers problems caused by intestinal helminth and the importance of bi-annual de-worming every six months. MCC left deworming treatment for every checked child at the different locations. Pre- and non- school children got a anti-worm tablet and explanations why and when this treatment should be taken.
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 and school age children.

4: Pneumonia: (28/1064; 3%) (see table 2)
The 28 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 (fever with tachypnoe).
For doctors working in Europe it is amazing how few children have asthma in Kenia. We only saw six children with symptoms of astma/bronchits.
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 pneumonia were transferred to the teachers and caretakers. We transferred one child from Kibera, Alisha Adhiamba to the hospital with a pneumonia and severe respiratory distress. Unfortanately she died of respiratory failure.

5: Cardial problems: (16/1064; 2 %) (see table 1 appendix)
Mitral regurgitation or ventricular 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 MCC carrousel includes a cardial examination. We suspected 16 children of having a pathological heart murmur. The children and their care takers with the suspected pathological heart murmurs were stressed on teeth brushing procedures. Besides this, they were told to give their child antibiotics when going to a dentist for a teeth extraction.
Two children in Naiwasha had a cardial problem which needed referral to a specialist. With the help of the Sophia Foundation for Children both these children were referred to the Coptic Hospital in Nairobi.
Joseph Mwaniki was diagnosed with cardiomegaly and referred for a cardiac ultrasound. Teriasia Waimatho from Naivashe was suspected of a Fallot and referred for confirming the diagnosis and treatment.
After a referral of MCC to the Coptic Hospital in Nairobi in 2010, Susan Kamau from Naivasha underwent a percutaneus cardiac intervention and was found to be in good health in 2011.

6: Skin diseases: (64/1064; 6%)(see table 1 of the appendix)
In respect to skin diseases we saw children with dermatomycoses (tinea capitis), eczema, wounds (burns and infectend wounds) but hardly any scabies and lice.
Antifungal cream (eventually in combination with hydrocortison) was given for fungal infections (dermatomycosis) and hydrocortison crème was given for different forms of dermatitis. We did treat the children with severe or infected forms of tinea capitis with griseofulvin. But in comparisson with 2010 the incidence of tinea capitiis in this selected population seemed to have dropped (10% in 2010).

7: Eye problems: (29/1064; 3%) (see table 1 of the appendix)
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. We treated children with painful eye's with extra vitamin suppletion and eyedrops.
Refraction problems were reported in six children (1%). One of these children was already diagnosed with a refraction disorder but couldn't afford glasses which are now provided for

by the Sophia Foundation. The other children with refraction problems were, with the financial support of the Sophia Foundation, referred to an ophtalmologist.

8: Dental: (caries not otherwise specified: 216/1064, 20%; painful caries: 66/1064; 6%; flurosis: 52/1064, 5%)
In general, a high caries prevalence was found.
Fortunately this year the MCC carroussel was honoured with the presence of Eleni Kapsou, a dentist from the Sophia Foundation for Children joining the team. Children with painful caries or other serious dental problems (2/1064, <1%) were seen by her. The needed extractions were performed on the spot and the need for further restoration of the teeth was documented as the Sophia Foundation is planning a dental mission in the near future. This cooperation was very succesfull and rewarding.
In Naiwasha, a striking high prevalence of flurosis was found (31/123: 25%) suggesting a contamination of water sources with fluor.
After the medical check local volunteers gave out toothbrushes and educated the people in teethbrushing.

Table 10: Prevalence of selected diagnosis per GEOGRAPHICAL LOCATION

LOCATION	St. Paul				Waithaka				Naivasha				St. Nicholas				St. George			
	n	/	N	%	n	/	N	%	n	/	N	%	n	/	N	%	n	/	N	%
Caries n.o.s.	11	/	72	15%	29	/	74	**39%**	39	/	123	**32%**	7	/	60	12%	19	/	122	16%
Fluorosis	1	/	72	1%	0	/	74	0%	31	/	123	**25%**	1	/	60	2%	3	/	122	2%
Caries with pain	8	/	72	11%	1	/	74	1%	9	/	123	7%	2	/	60	3%	7	/	122	6%
LOCATION	Kibera				Joy Springs				Makarios Home				Nyeri				Total			
	n	/	N	%	n	/	N	%	n	/	N	%	n	/	N	%	n	/	N	%
Caries n.o.s.	1	/	30	3%	68	/	383	18%	24	/	81	**30%**	18	/	118	15%	216	/	1064	**20%**
Fluorosis	0	/	30		10	/	383	3%	4	/	81	5%	2	/	118	2%	52	/	1064	**5%**
Caries with pain	4	/	30	13%	31	/	383	8%	1	/	81	1%	3	/	118	3%	66	/	1064	**6%**

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

Future medical needs:
- The children in the locations visited need more clean water for drinking and hygiene purposes. Especially providing a source of clean drinking water at the schools is important for lessons in hygiene and for giving the children a source of save drinking water when they are at school.
- It is important to stress the importance of regular (six monthly) de-worming of all children up to fourteen year of age. We have to find a way to implement such a program.
- In all locations visited, there is a strong need for comprehensive and systematic health promotion and preventive measures. Special emphasis needs to be put on personal hygiene (starting with the importance of hand washing with soap), dental care, good eating habits and nutritious food.
- There is a need to transfer information about health promotion and preventive measures to the mothers/caretakers of the children as well as knowledge of the alarming medical symptoms in children so they can find medical help in time.
- There is a need to find a method for keeping relevant medical information with the child (like the need of antibiotics before dental extraction in children with a cardial septal defect).We feel the Sophia Foundation is making a good start with trying to establish a pattern for follow-up.
-More information about the water supplies in Naivasha and investigations into the possible correlation between the quality of this water and the incidence of heartproblems and dental fluorosis in this area are needed.

Last words:

Once Africa gets into your heart she will never let you go. Both teamleaders, Nadine after joining Medical Checks for Children in 2010 for the first time as a team member and Karlien afterthe explorative mission in 2008 and leading the MCC team in Nairobi in 2010 feel very fortunate to be able to come back to Nairobi for another MCC mission.

It has been a memorable mission in the lives of all the team members. It's inspiring to see how people from different backgrounds and with different goals in life can form a close unit when the common goal is to help children.

The acceptance and warmth with which the children and their parents received us at their schools was humbling.

Special thanks go to all the members of the Sophia Foundation: to Marina Shakola who watched over us like a mother hen; to Noppi for joining our carrousel without any training and doing a tremendious job and to Eleni Kapsou for her eppic performance in pulling that many theeth under these dire circumstances.

Last but certainly not least thanks to Archbishop Makarios who's support was essential in many ways to make this mission a success.

Nadine van Dijk, organization-end-responsible MCC mission Nairobi, Kenia 2011
Karlien Bongers, medical-end-responsible MCC mission Nairobi, Kenia 2011

Arnhem, june 2011

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Table 1 : Prevalence of selected diagnosis per GEOGRAPHICAL LOCATION

LOCATION	Total			
	n	/	N	%
HIV positive	2	/	1064	0%
AIDS	10	/	1064	1%
Malaria (suspected)	1	/	1064	0%
Pneumonia (clinical diagnosis)	27	/	1064	3%
Pneumonia (confirmed by X-thorax)	1	/	1064	0%
BHR/Asthma	6	/	1064	1%
Dysenteria	2	/	1064	0%
Diarrhoea without dehydration	21	/	1064	2%
Obstipation	62	/	1064	6%
Active worm infection	14	/	1064	1%
Otitis media acuta / n.o.s.	7	/	1064	1%
Otitis media with effusion	4	/	1064	0%
Otitis externa	4	/	1064	0%
Adenotonsillitis / tonsillitis	10	/	1064	1%
Candida stomatitis	4	/	1064	0%
Sinusitis	1	/	1064	0%
Caries n.o.s.	216	/	1064	20%
Toothache	1	/	1064	0%
Fluorosis	52	/	1064	5%
Caries with pain	66	/	1064	6%
Wounds n.o.s.	8	/	1064	1%
Eczema n.o.s.	12	/	1064	1%
Dermatomycosis	33	/	1064	3%
Impetigo / furunculosis	5	/	1064	0%
erysipelas / cellulites	2	/	1064	0%
Wounds infected	2	/	1064	0%
Burn wound (fresh)	2	/	1064	0%
Psychomotoric retardation	63	/	1064	6%
Hypertonia	16	/	1064	2%
Hypotonia	1	/	1064	0%
Epilepsy	2	/	1064	0%
Migraine / headache	22	/	1064	2%
Physiological murmur	47	/	1064	4%
Pathological murmur (suspected)	16	/	1064	2%
Refractory problems	6	/	1064	1%
Strabismus	6	/	1064	1%
Keratoconjunctivitis	16	/	1064	2%
Amblyopia	1	/	1064	0%
Epi- / hypospadia	1	/	1064	0%
Inguinal hernia	1	/	1064	0%
Urinary tract infection	1	/	1064	0%
Hip dysplasia	1	/	1064	0%
Fracture	2	/	1064	0%
Hernia	2	/	1064	0%

Table 2 : Prevalence of selected Treatments per GEOGRAPHICAL LOCATION

LOCATION	St. Paul			Waithaka			Naivasha			St. Nicholas			St. George		
	n / N	%		n / N	%		n / N	%		n / N	%		n / N	%	
Ferro	15 / 72	21%		11 / 74	15%		9 / 123	7%		10 / 60	17%		51 / 122	42%	
Mother iron	0 / 72	0%		0 / 74	0%		1 / 123	1%		1 / 60	2%		0 / 122	0%	
Multivitamins	4 / 72	6%		21 / 74	28%		36 / 123	29%		19 / 60	32%		24 / 122	20%	
Preventive antiworm treatment	70 / 72	97%		58 / 74	78%		114 / 123	93%		56 / 60	93%		108 / 122	89%	
Acute worm treatment	1 / 72	1%		0 / 74	0%		5 / 123	4%		0 / 60	0%		10 / 122	8%	
Amoxicilline	2 / 72	3%		2 / 74	3%		8 / 123	7%		4 / 60	7%		2 / 122	2%	
Augmentin	0 / 72	0%		1 / 74	1%		1 / 123	1%		2 / 60	3%		2 / 122	2%	
Erythromycine	0 / 72	0%		0 / 74	0%		0 / 123	0%		0 / 60	0%		1 / 122	1%	
Eardrops	0 / 72	0%		1 / 74	1%		4 / 123	3%		0 / 60	0%		0 / 122	0%	
Hydrocortison cream	0 / 72	0%		0 / 74	0%		1 / 123	1%		0 / 60	0%		0 / 122	0%	
Dactarin cream	0 / 72	0%		1 / 74	1%		1 / 123	1%		2 / 60	3%		4 / 122	3%	
Dactacort cream	0 / 72	0%		0 / 74	0%		1 / 123	1%		1 / 60	2%		0 / 122	0%	
Fusidin cream	0 / 72	0%		2 / 74	3%		1 / 123	1%		0 / 60	0%		0 / 122	0%	
Flammazine	0 / 72	0%		0 / 74	0%		0 / 123	0%		0 / 60	0%		0 / 122	0%	
Eyedrops	0 / 72	0%		1 / 74	1%		3 / 123	2%		2 / 60	3%		2 / 122	2%	

LOCATION	Kibera			Joy Springs			Makarios Home			Nyeri School/village			Total		
	n / N	%		n / N	%		n / N	%		n / N	%		n / N	%	
Ferro	7 / 30	23%		96 / 383	25%		18 / 81	22%		22 / 118	19%		239 / 1064	22%	
Mother iron	1 / 30	3%		2 / 383	1%		0 / 81	0%		1 / 118	1%		6 / 1064	1%	
Multivitamins	10 / 30	33%		35 / 383	9%		16 / 81	20%		16 / 118	14%		181 / 1064	17%	
Preventive antiworm treatment	16 / 30	53%		13 / 383	3%		11 / 81	14%		98 / 118	83%		544 / 1064	51%	
Acute worm treatment	0 / 30	0%		0 / 383	0%		0 / 81	0%		0 / 118	0%		16 / 1064	2%	
Amoxicilline	2 / 30	7%		4 / 383	1%		2 / 81	2%		2 / 118	2%		28 / 1064	3%	
Augmentin	2 / 30	7%		1 / 383	0%		1 / 81	1%		3 / 118	3%		13 / 1064	1%	
Erythromycine	0 / 30	0%		1 / 383	0%		0 / 81	0%		1 / 118	1%		3 / 1064	0%	
Eardrops	0 / 30	0%		0 / 383	0%		0 / 81	0%		0 / 118	0%		5 / 1064	0%	
Hydrocortison cream	1 / 30	3%		2 / 383	1%		1 / 81	1%		2 / 118	2%		7 / 1064	1%	
Dactarin cream	2 / 30	7%		6 / 383	2%		2 / 81	2%		4 / 118	3%		22 / 1064	2%	
Dactacort cream	0 / 30	0%		2 / 383	1%		0 / 81	0%		3 / 118	3%		7 / 1064	1%	
Fusidin cream	0 / 30	0%		1 / 383	0%		0 / 81	0%		0 / 118	0%		4 / 1064	0%	
Flammazine	1 / 30	3%		1 / 383	0%		0 / 81	0%		0 / 118	0%		2 / 1064	0%	
Eyedrops	0 / 30	0%		2 / 383	1%		2 / 81	2%		3 / 118	3%		15 / 1064	1%	