Medical Report Kenya Nairobi 2017

Medical Checks for Children

Nadine van Dijk
Carolien Siersma
September 2017

medical checks for children

Introduction

From march 21th until march 27th 2017, a new Medical Checks for Children (MCC) team visited different schools and other locations in Nairobi and Nyeri. Free of cost, the MCC team checked and, as needed, treated 1089 children, newborns to teenagers.

The team included:
- Nadine van Dijk, emergency physician, mission leader, responsible for medical issues & organization
- Carolien Siersma, pediatrician - pediatric ICU, mission leader, responsible for medical issues & organization
- Ingrid van Londen, general practitioner
- Marjet Braamskamp, resident in pediatrics
- Kiry Schene, physician
- Janneke Boers, pediatric nurse
- Mariska van Asselt, pediatric nurse
- Sylvia Ras, trainer & change consultant
- Jolanda van Plateringen, physician assistent

As in former years our host patron during this medical camp was Archbishop Makarios, Head of the Orthodox Seminary in Riruta, Nairobi. The checks were organized in close collaboration with the Sophia Foundation for Children (SFFC, www.sophia-foundation.com).
Since the first explorative checks in Nairobi in 2008, yearly successful checks have been performed.

Technical equipment, medical supplies and toothbrushes were brought in from the Netherlands by our team members. Most of the medication was ordered by SFFC and supplied by the main Kenyan pharmacy in Nairobi.

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

- Transfer of knowledge about expected problems and diseases, partly by experienced earlier work in Kenya
- Transfer of data on demographics
- Selection of primary schools and other check locations (orphanage, refugee camp)
- Accommodation arrangement around check locations
- Transportation of the MCC team
- Prior announcement of the medical camps at the different locations
- Ordering and delivery of medication
- Supporting the medical team during the medical camp

- Management of referrals and (pre)payment of in- & outpatient hospital costs (at Riruta Clinic Nyeri and Coptic Hospital Nairobi)

The MCC team was again delighted with the cooperation with Archbishop Makarios and the experienced input of the Sophia Foundation for Children. We would especially like to thank Marina Shacola, Nopi Telemachou, Marinos Constandinou, David Alimasi, Nelson Aderi, Gerald Mochirien, Hesbon Aderi, and Lameck Koech, for their work and support during our medical camp. Further regards go to all teachers and translators at the different locations, volunteers and the local community.
We are grateful to have had the opportunity to work with and learn from all these inspiring people who have helped us directly or indirectly. And last but not least of course thank you to all of the children for their happiness and smile, and their care takers for the trust they put in us.

Medical Checks for Children on location

The medical checks were performed on 7 days at 8 different locations in Nairobi and Nyeri. Apart from the children at the schools the team checked children brought in from the community by their care takers. The different locations during this medical camp were:

- St George School and nearby community, Nairobi
- St Clemens School and nearby community, Nairobi
- Joyspring School, Nairobi
- Jamii School, Nairobi
- Makarios Orphanage and School and nearby community, Nyeri
- Ndunduini School and nearby community, Nyeri
- Jambo Rescue Center, Nyeri
- Kangaroo School and nearby community, Nairobi

During the medical camp the children were checked according to the MCC carrousel:

1. Registration
2. Anthropometric measurements (height and weight)
3. Blood testing for anemia (hemoglobin), urine testing if needed, and malaria checkup when indicated
4. Health check by one of the medical doctors
5. Providing medication at the pharmacy (including explaining to care takers their mode of use)
6. Education about nutritious food and water intake, tooth brushing (every child was given a toothbrush) and hand washing

At each station special attention is focused on drinking water and good dietary habits, especially at the doctors and pharmacy. Further more attention focused on prevalence, treatment and prevention of anemia, growth abnormalities and infectious diseases. Children, care takers and teachers were educated on good nutrition and hygiene measures.

Results medical camp

For data analysis purposes several data were pooled and subgroup analyses were performed. Statistical support for the observations in our report are not possible due to the small groups.

In total our MCC team checked 1089 children (table 1).

	21-3	22-3	23-3	24-3	25-3	26-3	27-3	Total
George Spring								***71***
St George		163					16	**179**
St Clemens	186						2	**188**
Joyspring			75					**75**
Jamii			87					**87**
Makarios home					86			**86**
Makarios school					129			**129**
Ndunduini				142				**142**
Jambo Rescue Center						30		**30**
Kangaroo							102	**102**
Total	**186**	**163**	**162**	**142**	**215**	**30**	**150**	**1089**

Table 1 Number of children checked at different locations

The St. George and St. Clemens schools in Kibera are supported by the Greek Orthodox Church in Africa. At St. George the Sophia Foundation for Children (SFFC) started a food program in 2009.
Makarios Children's Home is an orphanage founded and funded by SFFC, at which they supply full board, clothing, health care, education and recreation.

The Joyspring School at Kibera is not structurally supported by any organization, though they are involved in a deworming program funded by the World Health Organization. Kangaroo School, a small school for refugees from Uganda in the slums of Nairobi, has been visited since 2014. It is also not supported by any organization.
The Jambo Rescue Center nearby Nyeri is a small unsupported project where street children are taken care of. It is visited by MCC since 2015.
The unsupported Ndunduini School was checked for the second time this year.

	Total	≤ 1 year	1-5 years	<5 years	5-10 years	>10 years
George Spring	*71*	*0*	*0*	*0*	*71 (100)*	*0*
St George	179	12 (7)	51 (28)	63 (35)	115 (64)	1 (1)
St Clemens	188	15 (8)	13 (7)	28 (15)	147 (78)	13 (7)
Joyspring	75	0	43 (57)	43 (57)	32 (43)	0
Jamii	87	2 (2)	29 (33)	31 (36)	56 (64)	0
Makarios home	86	2 (2)	5 (5)	7 (8)	25 (29)	54 (63)
Makarios school	129	1 (1)	22 (17)	23 (18)	66 (51)	40 (31)
Ndunduini	142	7 (5)	20 (14)	27 (19)	113 (80)	2 (1)
Jambo Rescue Center	30	0	4 (13)	4 (13)	16 (53)	10 (33)
Kangaroo	102	8 (8)	28 (27)	36 (35)	63 (62)	3 (3)
	1089	**47 (4)**	**215 (20)**	**262 (24)**	**704 (65)**	**123 (11)**

Table 2 Age distribution per location (% of total at location)

	Total	Boy	Girl
George Spring	*71*	*34 (48)*	*36 (51)*
St George	179	81 (45)	97 (54)
St Clemens	188	104 (55)	84 (45)
Joyspring	75	42 (56)	33 (44)
Jamii	87	43 (49)	44 (51)
Makarios home	86	49 (57)	37 (43)
Makarios school	129	64 (50)	65 (50)
Ndunduini	142	69 (49)	71 (50)
Jambo Rescue Center	30	11 (37)	19 (63)
Kangaroo	102	53 (52)	49 (48)
	1089	**550 (51)**	**535 (49)**

Table 3 Gender distribution at location

Because we visit the schools for several consecutive years, we are able to follow-up on growth and development of part of these children. This year 390 (36%) of the checked children were also checked last year. (Table 4)

	Total	Yes (%)	No (%)
George Spring	*71*	*17 (24)*	*54 (76)*
St George	179	52 (29)	127 (71)
St Clemens	188	113 (60)	74 (39)
Joyspring	75	0	75 (100)
Jamii	87	9 (10)	78 (90)
Makarios home	86	73 (85)	13 15()
Makarios school	129	81 (63)	48 (37)
Ndunduini	142	27 (19)	115 (81)
Jambo Rescue Center	30	0 (0)	30 (100)
Kangaroo	102	18 (18)	84 (82)
	1089	**390 (36)**	**698 (64)**

Table 4 Children checked last year

Since health education and transfer of knowledge is one of the main goals of MCC, we believe attendance of care takers is of great importance. Therefor we are pleased to see that almost all children were accompanied by a parent or teacher. In that way we hope this knowledge will be used and preserved. (Table 5)

	Total	Parent (%)	None (%)	Teacher (%)
George Spring	*71*	*0*	*0*	*71 (100)*
St George	179	82 (46)	1 (1)	96 (54)
St Clemens	188	135 (72)	0 (0)	53 (28)
Joyspring	75	3 (4)	1 (1)	71 (95)
Jamii	87	2 (2)	6 (7)	79 (91)
Makarios home	86	77 (90)	0 (0)	9 (10)
Makarios school	129	126 (98)	1 (1)	2 (2)
Ndunduini	142	17 (12)	3 (2)	122 (86)
Jambo Rescue Center	30	30 (100)	0 (0)	0 (0)
Kangaroo	102	60 (59)	0 (0)	42 (41)
	1089	**532 (49)**	**12 (1)**	**545 (50)**

Table 5 Child accompanied by care taker at check

1. *Growth abnormality and malnutrition*

Growth retardation is correlated with poverty, malnutrition, poor living conditions, poor hygiene and the prevalence of chronic diseases. The major causes of malnutrition are lack of food, poor feeding habits and inadequate nutritional child care.

Malnutrition is related to poor cognitive and school performances. Also, there is strong evidence to suggest that malnutrition places children under the age of five at increased risk of mortality. It is thought to account for one third of all deaths in children under five years of age (UN Millennium Developmental Goals).

Therefor school meals are provided, and educational programs for parents and teachers, addressing nutritious food and child care, are important activities during the checks. We assessed growth abnormalities, measuring weight and height in a standardized fashion, using the following criteria.

- *underweight*: weight for age at or under third percentile for the reference population (WHO growth curves, for children up to the age of 10 years). This is an indicator of malnutrition or weight loss due to disease.
- *stunting*: height for age at or under third percentile for the reference population (WHO growth curves, for children up to 19 years of age). This is an indicator of chronic malnutrition.
- *wasting*: weight for height at or under third percentile for the reference population (WHO growth curves, for children up to 120 cm in height). This is an indicator of acute malnutrition.

It also has to be noted that reference data are only available for certain heights, weights and ages, as specified above. This leads to the general prevalence of growth abnormalities as follows;

	Underweight	Stunting	Wasting
2017	5	7	5
2016	5	7	3
2015	8	15	7
2014	5	12	2
2013	5	14	1
2012	10	16	

Percentages per year

These percentages are comparable to last year's numbers. Unfortunately, due to difficulty in using the reference tables some registration data of underweight, stunting and wasting is registered 'unknown', although the anthropometric data were collected.

The most notable differences will be discussed here. (See tables 7, 9, 11)
Nutritional status shows significant differences among the locations visited and between age groups. The prevalence of HIV related underweight (wasting syndrome) is unknown and might be underestimated.

Underweight

- We did not register any underweight in children aged > 10 years
- Underweight is more prevalent in children aged 5-10 years
- At St George & Makarios Home we registered high percentages of underweight in children under 5 years of age

Stunting

- Stunting is more prevalent in the youngest (<1 year) and oldest (>10 year) age groups
- The high percentage of stunting under 1 year of age is accounted for by only 4 locations

Wasting

- Wasting was most prevalent at St George in age groups 1-5 years & 5-10 years, and at Jamii in age group 5-10 years

Compared to the higher prevalence of underweight, stunting and wasting at Ndunduini and Jambo Rescue Home in 2016, this year's percentages were equal to the others. Percentages of underweight, stunting as well as wasting declined at Jambo Rescue Home and Ndunduini. Numbers in 2018 must be awaited to evaluate sustainability of these improvements. It might, in part, be caused by raised attention to the importance of nutrition and feeding habits.

The abovementioned stresses the importance of adequate food intake and the impact of food programs like that provided by SFFC. We are confident that long term food programs at these locations will improve long term anthropometric data and physical wellbeing of these children.

During the medical checks we paid special attention to issues like hygiene and nutrition. We emphasized on hand washing, fruit & vegetable and water intake in order for the children to grow up healthy and strong. We noticed the habitude of mothers to feed their babies up to the age of one year, or even beyond, solely with breast milk.
For babies, we advised exclusive breastfeeding up to the age of six months, after which additional foods should be introduced. We are aware of the financial issues and scarcity of healthy foods because of drought. This is one of the most important reasons for MCC to link up and cooperate with organizations like SFFC, to facilitate and fund school lunches.

	Total	Yes (%)	No (%)	Unknown (%*)
George Spring	*71*	*0*	*71 (100)*	*0*
St George	179	15/177 (8)	162/177 (92)	2 (1)
St Clemens	188	7/177 (4)	169/177 (95)	12 (6)
Joyspring	75	1 (1)	74 (99)	0
Jamii	87	3 (3)	84 (97)	0
Makarios home	86	1/35 (3)	34/35 (97)	51 (59)
Makarios school	129	5/90 (6)	85/90 (94)	39 (30)
Ndunduini	142	6/142 (4)	136/142 (96)	0 (0)
Jambo Rescue Center	30	1/21 (5)	20/21 (95)	9 (30)
Kangaroo	102	6/98 (6)	92/98 (94)	4 (4)
	1089	**45/973 (5)**	**927/973 (95)**	**117 (11)**

Table 6 Prevalence of underweight (weight/age <P3) (* % of total)

	Total	≤ 1 year (%)*	1-5 years (%)*	<5 years (%)*	5-10 years (%)*	>10 years (%)*
George Spring	*71*	*0*	*0*	*0*	*0*	*0*
St George	179	1 (8)	7 (14)	8 (13)	7 (6)	0
St Clemens	188	1 (7)	0	1 (4)	6 (4)	0
Joyspring	75	0	1 (2)	1 (2)	0	0
Jamii	87	0	0	0	3 (5)	0
Makarios home	86	0	1 (20)	1 (14)	0	0
Makarios school	129	0	2 (9)	2 (9)	3 (5)	0
Ndunduini	142	0	0	0	6 (5)	0
Jambo Rescue Center	30	0	0	0	1 (6)	0
Kangaroo	102	0	1 (4)	1 (3)	5 (8)	0
	1089	**2 (4)**	**12 (6)**	**14 (5)**	**31 (4)**	**0**

Table 7 Prevalence of underweight (weight/age <P3) by age

*** Percentages presented of total children in age group at location**

	Total	Yes (%)	No (%)	Unknown (%)
George Spring	*71*	*1 (1)*	*70 (99)*	*0*
St George	179	11 (6)	165 (94)	3 (2)
St Clemens	188	15 (8)	172 (91)	0
Joyspring	75	1 (1)	74 (99)	0
Jamii	87	4 (5)	83 (95)	0
Makarios home	86	10 (12)	76 (88)	0
Makarios school	129	12 (9)	116 (91)	1 (1)
Ndunduini	142	6 (4)	136 (96)	0
Jambo Rescue Center	30	1 (3)	29 (97)	0
Kangaroo	102	17 (17)	85 (83)	0
	1089	**78 (7)**	**1006 (93)**	**4 (0)**

Table 8 Prevalence of stunting (length/age <P3)

	Total	≤ 1 year (%)*	1-5 years (%*)	<5 years (%)*	5-10 years (%)*	>10 years (%)*
George Spring	*71*	*0*	*0*	*0*	*1 (1)*	*0*
St George	179	1 (8)	2 (4)	3 (5)	8 (7)	0
St Clemens	188	0	1 (8)	1 (4)	11 (7)	3 (23)
Joyspring	75	0	1 (2)	1 (2)	0	0
Jamii	87	0	1 (3)	1 (3)	3 (5)	0
Makarios home	86	1 (50)	1 (20)	2 (29)	0	8 (15)
Makarios school	129	0	3 (14)	3 (13)	4 (6)	5 (13)
Ndunduini	142	2 (29)	0	2 (7)	4 (4)	0
Jambo Rescue Center	30	0	0	0	0	1 (10)
Kangaroo	102	2 (25)	4 (14)	6(17)	10 (16)	1 (33)
	1089	**6 (13)**	**13 (6)**	**19 (7)**	**41 (6)**	**18 (15)**

Table 9 Prevalence of stunting (length/age <P3) by age

*** Percentages presented of total children in age group at location**

	Total	Yes (%)	No (%)	Unknown (%)
George Spring	*71*	*1 (3)*	*32 (97)*	*38 (54)*
St George	179	20 (15)	115 (85)	44 (25)
St Clemens	188	3 (3)	93 (96)	91 (48)
Joyspring	75	0	66 (100)	9 (12)
Jamii	87	4 (6)	61 (94)	22 (25)
Makarios home	86	0	12 (100)	74 (86)
Makarios school	129	1 (2)	47 (98)	80 (62)
Ndunduini	142	6 (7)	86 (93)	50 (35)
Jambo Rescue Center	30	0	9 (100)	21 (70)
Kangaroo	102	0	83 (100)	19 (19)
	1089	**35 (5)**	**604 (94)**	**448 (41)**

Table 10 Prevalence of wasting (weight/length <P3)

	Total	≤ 1 year (%)*	1-5 years (%)*	<5 years (%)*	5-10 years (%)*	>10 years (%)*
George Spring	*71*	*0*	*0*	*0*	*1 (3)*	*0*
St George	179	0	11 (22)	11 (18)	9 (12)	0
St Clemens	188	1 (8)	0	1 (4)	2 (3)	0
Joyspring	75	0	0	0	0	0
Jamii	87	0	0	0	4 (12)	0
Makarios home	86	0	0	0	0	0
Makarios school	129	0	0	0	1 (4)	0
Ndunduini	142	0	0	0	6 (9)	0
Jambo Rescue Center	30	0	0	0	0	0
Kangaroo	102	0	0	0	0	0
	1089	**1 (2)**	**11 (5)**	**12 (5)**	**23 (6)**	**0**

Table 11 Prevalence of wasting (weight/length <P3) by age

*** Percentages presented of total children in age group at location**

2. *Anemia*

Anemia is largely caused by the most prevalent global micronutrient deficiency (iron). In Kenya no national policy has been implemented so far to provide iron supplements to pregnant women or young children. Because iron deficiency is frequently the primary factor contributing to anemia, it is important to recognize that healthy food apart from iron supplements are needed to address this health problem.
In addition to iron deficiency, infectious diseases such as worm infections and chronic infections, especially HIV-AIDS and tuberculosis, contribute to the prevalence of anemia. Other nutritional deficiencies can also cause this medical problem.
Ferritin measurement could help differentiate between iron deficiency and other causes of anemia, such as hemoglobinopathies (sickle cell disease, thalassemia), and lead, mercury and arsenic intoxications. As to date this is not possible in our medical camps.

Anemia was diagnosed in 26% of all checked children this year. (see Tables 12-14)

Year	Percentage
2017	26%
2016	29%
2015	22%
2014	33%
2013	26%
2012	24%

	Total	Yes (%)	No (%)	Unknown (%)	Hb < 5 mmol/l
George Spring	*71*	*21 (30)*	*50 (70)*	*0*	*2 (3)*
St George	179	69 (39)	110 (61)	0	1 (1)
St Clemens	188	48 (26)	139 (74)	1	3 (2)
Joyspring	75	14 (19)	59 (81)	2	0
Jamii	87	30 (34)	57 (66)	0	0
Makarios home	86	16 (19)	70 (81)	0	0
Makarios school	129	26 (20)	103 (80)	0	1 (1)
Ndunduini	142	37 (26)	105 (74)	0	3 (2)
Jambo Rescue Center	30	4 (13)	26 (87)	0	0
Kangaroo	102	20 (21)	75 (79)	7	0
	1089	**285 (26)**	**794 (73)**	**10**	**10 (1)**

Table 12 Prevalence of anemia

	Total (%)	Ndunduini	Joyspring	Kangaroo	Makarios	Rescue Center	St Clemens	St George
2017	285 (26)	37 (26)	14 (19)	20 (20)	42 (20)	4 (13)	48 (26)	69 (39)
2016	265 (29)	39 (25)	40 (21)	33 (27)	20 (27)	7 (24)	39 (27)	33 (38)
2015	254 (22)		22 (16)	36 (22)	39 (38)	20 (32)	34 (21)	27 (13)
2014	354 (33)		38 (21)	48 (61)	58 (55)		27 (18)	61 (40)
2013	275 (26)		21 (16)		24 (39)		36 (24)	48 (22)
2012	251 (24)		53 (24)		15 (23)		45 (32)	19 (15)

Table 13 Prevalence of anemia in recent years

Due to the small number of children in all age groups, especially those above the age of 10 years, percentages must be evaluated with great care.
The prevalence of anemia appears to be slightly higher in the younger age groups. The prevalence of anemia declined at the Jambo Rescue Center and Kangaroo (although last years numbers were split in school and village). This is possibly caused by the improved nutritional status, in accordance with improvement in anthropometric measurements at these locations.

We can only speculate on the cause of regional differences in the prevalence of anemia. It might be due to comorbidities (especially at Makarios), nutritional deficiencies or the prevalence of malaria.

	Total	≤ 1 year (%)*	1-5 years (%)*	<5 years (%)*	5-10 years (%)*	>10 years (%)*
George Spring	*71*	*0*	*0*	*0*	*21 (30)*	*0*
St George	179	7 (58)	15 (29)	22 (35)	47 (41)	0
St Clemens	188	6 (40)	7 (54)	13 (46)	30 (20)	5 (38)
Joyspring	75	0	9 (21)	9 (21)	5 (16)	0
Jamii	87	0	12 (41)	12 (39)	18 (32)	0
Makarios home	86	1 (50)	2 (40)	3 (43)	2 (8)	11 (20)
Makarios school	129	0	4 (18)	4 (17)	19 (29)	3 (8)
Ndunduini	142	3 (43)	8 (40)	11 (41)	25 (22)	1 (50)
Jambo Rescue Center	30	0	0	0	3 (19)	1 (10)
Kangaroo	102	2 (25)	5 (18)	7 (19)	13 (21)	0
	1089	**19 (40)**	**62 (29)**	**81 (31)**	**183 (26)**	**21 (17)**

Table 14 Anemia by age group

*** Percentages presented of total children in age group at location**

3. *Worm treatment*

There is a relationship between the presence of worm infections like ascaris (prevalence 19% in Kenya), hookworm (prevalence 8% in Kenya) and tape worm (taenia saginata) and anemia, growth disturbances and school attendance and results. Worldwide studies have shown deworming to be the far most cost-effective way to improve school participation. As a result, the gain in literacy from deworming is 2.1 years and the gain in income is estimated at 4, just by giving an anti-worm tablet twice a year. Overall, the benefits of deworming can be up to 60 times higher than the costs.

Overall only 174 children (16%) were treated with preventive anti-worm treatment in the last six months before our checks. Only at Makarios Home most children had been given this preventive treatment, at the other locations almost none of them had.
Because of the important gain of this preventive measure, to improve health and school attendance and improve future chances, we put extra effort in educating teachers and parents about this. (Table 15)
The residual albendazole was left in Nairobi, as SFFC will revisit different locations after six months to supply new treatment.

An active worm infection was suspected and treated in only 2 children, at St. Clemens.

	Total	Yes (%)	No (%)
George Spring	*71*	*0*	*71 (100)*
St George	179	1 (1)	178 (99)
St Clemens	188	5 (3)	183 (97)
Joyspring	75	0	75 (100)
Jamii	87	1 (1)	85 (98)
Makarios home	86	83 (97)	3 (3)
Makarios school	129	51 (40)	78 (60)
Ndunduini	142	2 (1)	140 (99)
Jambo Rescue Center	30	0	30 (100)
Kangaroo	102	31 (30)	71 (70)
	1089	**174 (16)**	**914 (84)**

Table 15 Preventive anti-worm treatment in the last 6 months

	Total	≤ 1 year (%)*	1-5 years (%)*	<5 years (%)*	5-10 years (%)*	>10 years (%)*
George Spring	*71*	*0*	*0*	*0*	*0*	*0*
St George	179	0	0	0	1 (1)	0
St Clemens	188	1 (7)	0	1 (4)	4 (3)	0
Joyspring	75	0	0	0	0	0
Jamii	87	0	0	0	1 (2)	0
Makarios home	86	1 (50)	3 (60)	4 (57)	25 (100)	54 (100)
Makarios school	129	0	12 (55)	12 (52)	29 (44)	10 (25)
Ndunduini	142	0	0	0	2 (2)	0
Jambo Rescue Center	30	0	0	0	0	0
Kangaroo	102	0	9 (32)	9 (25)	22 (35)	0
	1089	**2 (4)**	**24 (11)**	**26 (10)**	**84 (12)**	**64 (52)**

Table 16 Preventive anti-worm treatment by age group

*** Percentages presented of total children in age group at location**

4. *Pneumonia and other pulmonary problems*

Of all checked children 8 of them were on clinical grounds suspected to have pneumonia (3 at the Jamii, 2 at the Kangaroo, 2 at St Clemens and 1 at Ndunduini), for which they were all treated with antibiotics. Two children were diagnosed with bronchitis. Six were diagnosed with asthma for which they were treated with inhaled salbutamol. For administration purposes handmade spacers were supplied.

5. *Cardiac abnormalities*

Mitral regurgitation and atrioventricular septal defects are among the most common heart defects in the third world. Treatment for these defects is not available in those countries.
The MCC carousel includes a cardiac examination. If diagnosed cardiac defects can be treated, funding will be rendered from the Nieuwendijk Foundation.
Of all 1089 checked children 3 of them were diagnosed with a physiological type of murmer, 2 with a suspected pathological murmer.
At the Makarios Home two children are known to have a cardiac problem amongst other problems. They were and will be regularly checked for their physical and cardiac wellbeing, and treatment will be adjusted accordingly.
A good dental situation is essential in all children but especially for them having a cardiac problem. Children with (suspected) cardiac pathology and their care takers were educated on teeth brushing and the importance was stressed. Besides this the care takers were told to give the child antibiotics when visiting a dentist for teeth extraction.

6. *Skin diseases*

Tinea capitis is a widespread problem amongst school children in Kenya due to transmission of the fungi by shaving many children with the same razor blades. We accept a certain degree of underscoring, we only report on the most severe cases that were needed to be treated.
In total 60 children (6%) were reported to have serious fungal infections, of which some were treated with griseofulvin. Especially at the Jambo Rescue Home dermatomycosis was more prevalent (23%).
Many other skin problems were diagnosed, like (infected) wounds, eczema and scabies. These were all treated according to our protocols.

7. *Dental care*

Poor dental care and a high prevalence of caries with or without pain were well recognized problems at earlier medical camps. Also this year we checked many children with dental problems. The reported data are assumed to be an underestimation of the actual prevalence.
As last year there were no dentists joining our medical camp this year. Therefor we needed to refer a lot of children with caries with pain to a local dentist (60 children, almost 6%).

	Total	Caries n.o.s.	Pain n.o.s.	Fluorosis	Caries with pain
George Spring	*71*	*11 (15)*	*0*	*2 (3)*	*3 (4)*
St George	179	32 (18)	0	5 (3)	13 (7)
St Clemens	188	56 (30)	1 (1)	13 (7)	6 (3)
Joyspring	75	13 (17)	0	1 (1)	3 (4)
Jamii	87	14 (16)	0	1 (1)	2 (2)
Makarios home	86	22 (26)	1 (1)	2 (2)	3 (3)
Makarios school	129	34 (26)	0	3 (2)	13 (10)
Ndunduini	142	39 (27)	0	2 (1)	9 (6)
Jambo Rescue Center	30	5 (17)	1 (3)	1 (3)	4 (13)
Kangaroo	102	24 (24)	0	7 (7)	0
	1089	**250 (23)**	**3 (0)**	**37 (3)**	**56 (5)**

Table 17 Dental problems at different locations

In the medical carousel the last station is staffed by team members or local volunteers that educate children and their care takers in brushing the teeth and tooth brushes are distributed to all children. We also stressed the need for brushing teeth to the teachers, and suggested to think about a school ritual in brushing teeth.

8. *Other*

Referrals

- During the checks this year there were 4 children with a history of (suspected or actual) physical or mental abuse. They were referred for medical problems if needed, and taken care of as was possible at the different locations. We hope to follow-up on them next year's MCC medical camp.

- At Kangaroo we checked a 6 months old girl with malnourishment and severe dehydration. She was immediately sent to the hospital because of a severely compromised physical state, where she was admitted and taken care of. We were happy to hear shortly thereafter that she made a fast and good recovery.

Education of health workers, care takers and teachers

One of the important tasks of MCC is to enhance knowledge of health, hygiene and encourage the continuation of health education of care takers, teachers and older children. We focused on malnutrition and nutritional food, infections and transmission of them, and the importance of twice-yearly preventive anti worm treatment. One of the important issues in preventing infections is washing hands with soap before eating and after lavatory use. This will help reduce the prevalence of diarrhea, upper airway and skin infections.

Notes

- ✓ Due to registration difficulty 71 children were labeled 'George Spring'. As they could not be assigned to their actual location, they were analyzed separately.

- ✓ The trees at Ndunduini school that were planted in 2016 after our first medical camp there, as a mark of new collaboration, were checked upon. They were taken good care of, and survived a long period of drought. Next year we hope to see them grow again.

  The headteacher at Ndunduini expressed the wish for a bore hole at this location to provide in the need for water supply. As we wish to put in local programs and funding in this effort, thereby embedding sustainability, we advised the locally involved parties and supported this initiative. We hope to be able to see progress next year.

  In 2016 we ascertained the wish to evaluate options on starting a class for children with special needs at Ndunduini. This year this class was not yet established. We evaluated with the headteacher the options and hope this initiative will be followed up.

- ✓ We were delighted to see the work that was done at Kangaroo school in improving the environment of the school and church. The muddy grounds have been covered with rubble and were far more easy to walk across.

  However entering the school area the team had to cross a dumping ground, where men were eventually having impendent behavior. This will be reason to check the children of Kangaroo school at a different location next year.

- ✓ Like in earlier years, due to drought, water is scarce and crops don't grow. Children don't drink much water and they complain of headache. We educated the children, care takers and teachers about the importance of drinking water. To supply water to them, we filled empty water tanks where it was needed. They will be refilled until the rainy season starts.

Final words

Our thanks go out to all people we worked with; our MCC team, the SFFC team, teachers, volunteers, care takers and children. We have again enjoyed the medical camp, were inspired by the enthusiasm of all of them and are confident that we share the same goals to optimize future opportunities for children.