Medical Checks for Children

Medical Rapport Kenya West 2018

Nadine van Dijk

MCC Kenya West 2018

Introduction

Van 11 maart tot en met 17 maart 2018 heeft een MCC team wederom op diverse locaties in Kenia West naast uitgebreide gezondheidsvoorlichting aan care takers ongeveer 850 kinderen medisch onderzocht en behandeld.

De medical checks vonden in de omgeving van Kisumu en Eldoret plaats op ongeveer 1500 m hoogte. In de buurt van Kisumu werden op twee locaties kinderen gezien. In Kesengei kinderen van de Kesengei Nursery & Primary en in Kimarek kinderen van de Kimarek Nursery gezien. In de buurt van Eldoret werden in Chipsita kinderen van de St Peter's Kapkechui gezien. Daarnaast hebben wij dit jaar voor de vierde keer de children's reprimand home en de vrouwengevangenis in Nakuru bezocht. Een indrukwekkende en tevens confronterende ervaring.

Het overgrote deel van de gecheckte kinderen was jonger dan 10 jaar.

Het MCC team was in Kenia op uitnodiging Sophia Foundation for Children (http://sophia-foundation.com/index.html) welke op vele plekken in Kenia voedselprogramma's heeft op scholen en ook een weeshuis in beheer heeft.

Technische hulpmiddelen werden vanuit Nederland meegenomen door alle teamleden. Medicijnen zijn met behulp van de Sophia Foundation for Children besteld bij de Keniaanse groothandel Mission for Essential Drugs and Supplies (MEDS).

Het MCC-team bestond uit de volgende teamleden: Nadine van Dijk, Spoedeisendehulp arts, medisch eindverantwoordelijk en missieleider, bestuurslid MCC; Maria Duenk, leerkracht; Maria Heikoop, huisarts; Nel Mocking, mediator; Jolijn van de Zande, arts; Nori Smeets, arts; Larissa Kloowijk, arts en Jacqueline Fliervoet

Gedurende de controles op de scholen is gewerkt volgens het MCC-carrousel model met voor alle kinderen een tandenpoets instructie en een tandenborstel. Daarnaast is er aandacht besteed aan de voorlichting van ouders en begeleiders ten aanzien van voeding en hygiëne.

Wij waren erg blij om te zien dat het tandenpoets project dat vorig jaar gestart is nog steeds goed loopt! We hebben voor 2018 dan ook weer tandenborstels gedoneerd en proberen het aantal klassen waar gepoetst wordt langzaam uit te breiden. Voor de toekomst worden sponsoren voor dit project gezocht!!

Door de financiële ondersteuning van de Sophia Foundation for Children konden we kinderen indien noodzakelijk doorsturen naar de locale kliniek welke ook ter plaatste geregistreerd werden voor een goede follow-up. Samen met de medewerkers van de Sophia Foundation zullen wij de follow-up van deze kinderen in 2018/2019 monitoren.

Onze speciale dank gaat uit naar Nopi, Tazos en Marina van de Sophia Foundation for Children. Mede dankzij hun aanwezigheid en participatie in ons team, is het gelukt om in deze afgelegen regio onder vaak moeilijke omstandigheden een geweldige prestatie neer te zetten.
De MCC-missie naar de regio rond Kisumu en Eldoret in Kenia, is een bijzondere ervaring geweest; de indrukwekkende landschappen, de scholen en de kinderen hebben een onvergetelijke indruk achter gelaten.

Door deze ervaringen en de resultaten die we samen weer hebben kunnen boeken, zien wij nu al uit naar het vervolg van deze samenwerking in 2019!

Nadine, Arnhem juni 2018

From March the 11th untill March the 17th 2018, a Medical Checks for Children (MCC) team visited locations near Kisumu and Eldoret in western Kenya. Free of cost, the MCC team checked and treated 842 children aged newborn untill 13 years of age.

MCC Kenya West 2018

After a explorative mission in 2010, MCC visited Kenia West for the eight time.
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 and taken with us to Kenia West.

Our special thanks go to Nopi and Tazos for their direct support during our medical camp and their help in all the necessary preparations during the year. Special thanks go to the translators and teachers.

Medical Checks for Children on location:
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 hyginics and tooth brushing (a tooth brush was given to each child)

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.

MCC Kenya West 2018

The medical checks were performed on six days at different locations in Kenia West near the cities of Kisumi at Lake Victoria and near Eldoret. The team visited Kesengei Nusery & Primeray at Kesengei; Kalamai Bay Nursery, Kimerek Nursery at Kimarek; St Peter's Kapkechui at Chipita , Nakuru childrens and reprimand home and Nakuru Womans prison.
At the different locations we checked beside the schoolchildren some young non-schoolgoing children from the villages.
We analysed the data to make a comparison as a group but we did not make a computer analysis on individual basis (table 1)

For the schools at Kimarek, Kesengei and St. Peters we did a sepate analysis for the baby classes. In Kenya children as old as 5 years can still be in babyclass. However, for this analysis all children of age 0-5 year seen at these locations were added to the baby class (e.g. Kesengei baby), in addition all other non-school—going-children of the community were added to this group. The rest of the school children were pooled together (all above 1, e.g. Kesengei).

During the years the ratio between girls and boys is stable.

Table 1: Total children per location

Location	**11-03-18**	**12-03-18**	**13-03-18**	**14-03-18**	**15-03-18**	**16-03-18**	**Total**
Home Welcome	0	0	0	0	38	0	38
Kamalabei school	0	0	142	0	0	0	142
Kamalabei village	0	0	20	0	0	0	20
Kesengei baby	0	37	0	0	0	0	37
Kesengei school	0	143	1	0	0	0	144
Kesengei village	0	30	0	0	0	0	30
Kimarek school	140	0	0	0	0	0	140
Kimarek village	28	0	0	0	0	0	28
Nakuru Remand Home	0	0	0	0	0	30	30
Nakuru Women Prison	0	0	0	0	0	20	20
St Peters school	0	0	0	194	0	0	194
St Peters village	0	0	0	19	0	0	19
Total	**168**	**210**	**163**	**213**	**38**	**50**	**842**

Table 2: Number. age and gender distribution of the 1068 checked children at the different locations

	Total		**Home Welcome**		**Kamalabei school**		**Kamalabei village**		**Kesengei baby**		**Kesengei school**		**Kesengei village**	
	842		**Total= 38**		**Total= 142**		**Total= 20**		**Total= 37**		**Total= 144**		**Total= 30**	
Age	**N**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
<=1 year	25	3%	0	0%	1	1%	3	15%	0	0%	0	0%	2	7%
>1 en <5 years	167	20%	0	0%	15	11%	15	75%	26	70%	3	2%	23	77%
<5 years	189	22%	0	0%	16	11%	17	85%	26	70%	3	2%	25	83%
>=5 en <=10 years	585	69%	7	18%	126	89%	3	15%	11	30%	140	97%	5	17%
>10 years	33	4%	30	79%	0	0%	0	0%	0	0%	1	1%	0	0%
Gender														
Boy	431	51%	19	50%	74	52%	12	60%	22	59%	65	45%	16	53%
Girl	408	48%	19	50%	68	48%	8	40%	15	41%	78	54%	14	47%

MCC Kenya West 2018

	Kimarek school		Kimarek village		Nakuru Remand home		Nakuru Womans Prison		St Peters School		St Peters village	
	Total= 140		Total= 28		Total= 30		Total= 20		Total= 194		Total= 19	
Age	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
<=1 year	1	1%	7	25%	0	0%	6	30%	0	0%	5	26%
>1 en <5 years	28	20%	17	61%	0	0%	9	45%	19	10%	12	63%
<5 years	29	21%	24	86%	0	0%	14	70%	19	10%	16	84%
>=5 en <=10 years	111	79%	4	14%	0	0%	2	10%	173	89%	3	16%
>10 years	0	0%	0	0%	0	0%	0	0%	2	1%	0	0%
Gender												
Boy	69	49%	16	57%	28	93%	9	45%	94	48%	7	37%
Girl	71	51%	11	39%	2	7%	11	55%	99	51%	12	63%

Percentage of children also checked last year

	Total		Home Welcome		Kamalabei school		Kamalabei village		Kesengei baby		Kesengei school		Kesengei village	
	842		Total= 38		Total= 142		Total= 20		Total= 37		Total= 144		Total= 30	
	N	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
No	501	60%	38	100%	38	27%	19	95%	37	100%	85	59%	29	97%
Yes	341	40%	0	0%	104	73%	1	5%	0	0%	59	41%	1	3%

	Kimarek school		Kimarek village		Nakuru Remand home		Nakuru Womans Prison		St Peters School		St Peters village	
	Total= 140		Total= 28		Total= 30		Total= 20		Total= 194		Total= 19	
	N	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
No	56	40%	26	93%	30	100%	20	100%	105	54%	18	95%
Yes	84	60%	2	7%	0	0%	0	0%	89	46%	1	5%

This year we tried to locate the old files of all the children which should have been seen last year according to the school or according to the caretakers. About half of the children we saw were seen in previous years. This seems to be in concordance with other locations.

1: Growth abnormality and malnutrition:

Overall data of growth abnormalities in the last 3 years.

All locations	2015	2016	2017	2018			
underweight	17%	10%	9%	9%			
stunting	20 %	11%	8%	6%			
wasting	6%	5%	5%	13%			

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.

The reported incidence for underweight (Kenya Statistical Factsheet WHO) is 16,5 % and for stunting 36%. These data are still the most recent WHO/Unicef country data from 2013.

Analysis of the nutritional status shows significant differences among the locations visited (see table 4, 5 and six) Within the children assessed, it is unknown how many children have HIV related weight loss (wasting syndrome).

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Table 4 *Prevalence of Weight/age (Underweight) on or below P3 per GEOGRAPHICAL LOCATION by AGE and GENDER*

	Total		Home Welcome		Kamalabei school		Kamalabei village		Kesengei baby		Kesengei school		Kesengei village	
	842		Total= 38		Total= 142		Total= 20		Total= 37		Total= 144		Total= 30	
	N	%	n	%	n	%	n	%	n	%	n	%	n	%
Underweight	73	9%	0	0%	9	6%	3	15%	5	14%	31	22%	73	9%
No underweight	703	90%	7	100%	133	94%	17	85%	32	86%	112	78%	703	90%
Unknown	64	8%	31	82%	0	0%	0	0%	0	0%	1	1%	64	8%
Underweight children per age														
<=1 year	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
>1 en <5 years	16	10%	0	0%	0	0%	2	13%	2	8%	0	0%	4	17%
<5 years	16	9%	0	0%	0	0%	2	12%	2	8%	0	0%	4	16%
>=5 en <=10 years	56	10%	0	0%	9	7%	1	33%	3	27%	31	22%	1	20%
>10 years	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Underweight children per gender														
Boy	37	10%	0	0%	7	9%	2	17%	4	18%	10	16%	3	19%
Girl	36	9%	0	0%	2	3%	1	13%	1	7%	21	27%	2	14%

	Kimarek school		Kimarek village		Nakuru Remand home		Nakuru Womans Prison		St Peters School		St Peters village	
	Total= 140		Total= 28		Total= 30		Total= 20		Total= 194		Total= 19	
	n	%	n	%	n	%	n	%	n	%	n	%
Underweight	8	6%	3	11%	0	0%	4	20%	4	2%	1	5%
No underweight	132	94%	24	86%	0	0%	16	80%	188	98%	17	89%
Unknown	0	0%	0	0%	30	100%	0	0%	2	1%	0	0%
Underweight children per age												
<=1 year	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
>1 en <5 years	4	14%	1	6%	0	0%	2	22%	0	0%	1	8%
<5 years	4	14%	1	4%	0	0%	2	14%	0	0%	1	6%
>=5 en <=10 years	4	4%	2	50%	0	0%	1	50%	4	2%	0	0%
>10 years	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Underweight children per gender												
Boy	2	3%	2	13%	0	0%	3	33%	4	4%	0	0%
Girl	6	8%	1	9%	0	0%	1	9%	0	0%	1	8%

Table 5 Prevalence of Height/age (Stunting) on or below P3 per GEOGRAPHICAL LOCATION by AGE and GENDER

	Total		Home Welcome		Kamalabei school		Kamalabei village		Kesengei baby		Kesengei school		Kesengei village	
	842		Total= 38		Total= 142		Total= 20		Total= 37		Total= 144		Total= 30	
	N	%	n	%	n	%	n	%	n	%	n	%	n	%

Stunting	48	6%	9	24%	4	3%	2	10%	2	5%	7	5%	6	20%
No stunting	791	94%	29	76%	138	97%	18	90%	35	95%	136	95%	24	80%
Unknown	2	0%	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%
Stunting children per age														
<=1 year	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
>1 en <5 years	11	7%	0	0%	0	0%	2	13%	1	4%	0	0%	4	17%
<5 years	11	6%	0	0%	0	0%	2	12%	1	4%	0	0%	4	16%
>=5 en <=10 years	24	4%	0	0%	4	3%	0	0%	1	9%	7	5%	2	40%
>10 years	9	28%	9	30%	0	0%	0	0%	0	0%	0	0%	0	0%
Stunting children per gender														
Boy	34	8%	9	47%	3	4%	2	17%	1	5%	3	5%	4	25%
Girl	14	3%	0	0%	1	1%	0	0%	1	7%	4	5%	2	14%

	Kimarek school		**Kimarek village**		**Nakuru Remand home**		**Nakuru Womans Prison**		**St Peters School**		**St Peters village**	
	Total= 140		**Total= 28**		**Total= 30**		**Total= 20**		**Total= 194**		**Total= 19**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Stunting	8	6%	3	11%	4	14%	3	15%	0	0%	0	0%
No stunting	132	94%	24	86%	25	86%	17	85%	194	100%	19	100%
Unknown	0	0%	0	0%	1	3%	0	0%	0	0%	0	0%
Stunting children per age												
<=1 year	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
>1 en <5 years	1	4%	1	6%	0	0%	2	22%	0	17%	0	0%
<5 years	1	3%	1	4%	0	0%	2	14%	0	31%	0	0%
>=5 en <=10 years	7	6%	2	50%	0	0%	1	50%	0	0%	0	0%
>10 years	0	0%	0	0%	0	0%	1	2%	0	0%	0	0%
Stunting children per gender												
Boy	3	4%	3	19%	4	15%	2	22%	0	0%	0	0%
Girl	5	7%	0	0%	0	0%	1	9%	0	0%	0	0%

Table 6 Prevalence of Weight/height (Wasting) on or below P3 per GEOGRAPHICAL LOCATION by AGE and GENDER

	Total		**Home Welcome**		**Kamalabei school**		**Kamalabei village**		**Kesengei baby**		**Kesengei school**		**Kesengei village**	
	842		**Total= 38**		**Total= 142**		**Total= 20**		**Total= 37**		**Total= 144**		**Total= 30**	
	N	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Wasting	76	13%	0	0%	17	14%	3	15%	10	27%	23	24%	3	10%
No wasting	502	87%	1	100%	103	86%	17	85%	27	73%	72	76%	26	90%
Unknown	263	31%	37	97%	22	15%	0	0%	0	0%	49	34%	1	3%
Wasting children per age														
<=1 year	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
>1 en <5 years	22	13%	0	0%	2	13%	2	13%	6	23%	0	0%	3	13%
<5 years	22	12%	0	0%	2	13%	2	12%	6	23%	0	0%	3	12%

>=5 en <=10 years	54	14%	0	0%	15	14%	1	33%	4	36%	23	25%	0	0%
>10 years	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Wasting children per gender														
Boy	34	12%	0	0%	11	18%	1	8%	7	32%	3	8%	0	0%
Girl	42	14%	0	0%	6	10%	2	25%	3	20%	20	36%	3	23%

	Kimarek school		**Kimarek village**		**Nakuru Remand home**		**Nakuru Womans Prison**		**St Peters School**		**St Peters village**	
	Total= 140		**Total= 28**		**Total= 30**		**Total= 20**		**Total= 194**		**Total= 19**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Wasting	9	7%	3	11%	0	0%	1	5%	6	7%	1	6%
No wasting	112	93%	24	86%	0	0%	19	95%	84	93%	17	94%
Unknown	19	14%	0	0%	30	100%	0	0%	104	54%	1	5%
Wasting children per age												
<=1 year	0	0%	0	0%	0	0%	0	0%	1	10%	0	0%
>1 en <5 years	4	14%	2	12%	0	0%	0	0%	2	11%	1	8%
<5 years	4	14%	2	8%	0	0%	0	0%	2	11%	1	6%
>=5 en <=10 years	5	5%	1	25%	0	0%	1	50%	4	6%	0	0%
>10 years	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Wasting children per gender												
Boy	5	8%	1	6%	0	0%	1	11%	5	11%	0	0%
Girl	4	7%	2	18%	0	0%	0	0%	1	2%	1	9%

In 2015 the incidence of underweight, stunting and wasting in Kimarek Nursery was 13%, 35% and 1% compared to 15%, 9%, 10% this year. In 2015 the numbers for St Peters overall were 6%, 8% and 2% compared to 4%, 5% and 2%.
Over the years there seems to be a positive trend towards less growth disorders. As always these conclusions must be made with the greatest of care as the population we see differs each year and only half of all children were seen in the previous year.

Of the 16 babies seen in the Nakuru woman's prison 5 had severe mulnutrition (25% stunting). The reality of growing up in these conditions is harse and we do realize that interventions are problematic due to strict regulations and control. We hope that the SFFC will be able to reach out into the secluded community and provide these vulnarable babies with a bit of extra nutrition to help them grow.

The overall prevalence for underweight, stunting and wasting showed minimal decrease in 2017. It is difficult to find a cause for this as the parameters are multifacorial and the groups of children we see show a lot of heterogeneity during the years.
In comparison with previous years the reported incidence of malnutrition and growth retardation is stable and the incidence of stunting is again wel below the reported WHO incidence in Kenya. Selection bias due to the large population of school going kids may be a factor in underreporting severe malnutrition.

During the medical check-ups of this year, we paid again attention to issues of hygiene and nutritional advise. For babies, we advised exclusive breastfeeding up to six months and then start with the introduction of additional foods.

On the schools that are in the feeding programm of the SFFC, each month dry foods are given. Fruit and vegetables are locally purchased and depend on the availablity and the season. Also we know that if the schools accept more children as was the case in St.Peters the amount of food is divided between more

children. Most of the children get their first meal of the day at school, 11 am porridge and somewhere around noon lunch. The amount of food the children receive at home for dinner could vary widely.

We are aware of the financial problems and, because of draught, scarcity of healthy food for many families.

2: Anaemia:

Overall data of anaemia in the last 3 years.

Overall	2015	2016	2017	2018			
Anaemia yes	37%	39%	45%	27%			
Hb < 5		2%	1%	1%			

Anemia is the most prevalent micronutrient disorder in the world. In Kenya, no national policy has been implemented so far to provide iron supplements to pregnant woman 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.
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.

This year the prevalence was lower than in previous years.

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Table 7: Prevalence of anaemia per geographical location by age and gender

	Total		Home Welcome		Kamalabei school		Kamalabei village		Kesengei baby		Kesengei school		Kesengei village	
	842		Total= 38		Total= 142		Total= 20		Total= 37		Total= 144		Total= 30	
	N	%	n	%	n	%	n	%	n	%	n	%	n	%
Anaemia	225	27%	13	34%	25	18%	7	35%	10	27%	47	33%	9	30%
No anaemia	609	72%	25	66%	117	82%	12	60%	27	73%	97	67%	21	70%
Unknown	4	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Hb <5,0 mmol	6	1%	0	0%	1	1%	0	0%	0	0%	1	1%	0	0%
Anaemia per age														
<=1 year	8	32%	0	0%	1	100%	1	33%	0	0%	0	0%	1	50%
>1 en <5 years	47	28%	0	0%	3	20%	4	27%	7	27%	2	67%	6	26%
<5 years	55	29%	0	0%	4	25%	5	29%	7	27%	2	67%	7	28%
>=5 en <=10 years	158	27%	3	43%	21	17%	2	67%	3	27%	45	32%	2	40%
>10 years	11	33%	10	33%	0	50%	0	0%	0	0%	0	0%	0	0%
Anaemia per gender														
Boy	117	27%	7	37%	13	18%	5	42%	7	32%	21	32%	5	31%
Girl	107	26%	6	32%	12	18%	2	25%	3	20%	26	33%	4	29%

	Kimarek school		Kimarek village		Nakuru Remand home		Nakuru Womans Prison		St Peters School		St Peters village	
	Total= 140		Total= 28		Total= 30		Total= 20		Total= 194		Total= 19	
	N	%	n	%	n	%	n	%	n	%	n	%
Anaemia	41	29%	8	29%	0	0%	7	35%	51	26%	7	37%
No anaemia	99	71%	17	61%	28	93%	12	60%	142	73%	12	63%
Unknown	0	0%	1	4%	2	7%	1	5%	0	0%	0	0%
Hb <5,0 mmol	0	0%	1	4%	0	0%	0	0%	3	2%	0	0%
Anaemia per age												
<=1 year	0	0%	2	29%	0	0%	2	33%	0	0%	1	20%
>1 en <5 years	9	32%	4	24%	0	0%	3	33%	5	26%	4	33%
<5 years	9	31%	6	25%	0	0%	5	36%	5	26%	5	31%
>=5 en <=10 years	32	29%	2	50%	0	0%	1	50%	45	26%	2	67%
>10 years	0	0%	0	0%	0	0%	0	0%	1	50%	0	0%
Anaemia per gender												
Boy	20	29%	5	31%	0	0%	4	44%	27	29%	3	43%
Girl	21	30%	3	27%	0	0%	3	27%	23	23%	4	33%

We treated the children with anaemia (and their mothers if they were breast fed) with supplements for three months. If we suspected a vitamin deficiet and/or a infection we gave multivitamins instead of iron supplements.

3: Worm treatment:

Overall data of profylactic antiwormtreatment for all locations in the last 3 years.

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All lacations profylaxis	2015	2016	2017
Worm treatment: yes	81%	72%	67%
Worm treatment: no	19%	28 %	37%

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.
In the last years a de-worming program was established in Kenya 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%.

If there was a clinical supsicion of an active worm infection or anemnestic clues of a gardia infection, children where treated either with albendazol for na active worm infection or with a course of metronidazol for a suspected gardia infection. We did not treat children below 2 years with profylactic antiwormtreatment following the international guidelines on the subject.

Dysenteria was suspected in 1 children (<1%) who was treated with a course of cotrimoxazol. This year no children were diagnosed with suspected guardia.

Last year we left antiworm tablets to be distributed at the SFFC schools for the twice annual deworming and we see this in the results. We hope the schools and the SFFC will find a way to ensure the twice annual deworming ensure this programm will last wel into the future. The data from the last 3 years show a downward trend in children receiving a twice annual antiworm tablet. A leading rol from schools, teacher and the SFFC is needed more then ever to ensure that govermental programms will keep reaching the vulnerable remote areas we visit during our medical camp.

Table 8: Prevalence preventive anti-worm treatment in the last half-year per geographical location by age and gender

	Total		**Home Welcome**		**Kamalabei school**		**Kamalabei village**		**Kesengei baby**		**Kesengei school**		**Kesengei village**	
	842		**Total= 38**		**Total= 142**		**Total= 20**		**Total= 37**		**Total= 144**		**Total= 30**	
	N	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Anti-worm	3	0%	0	0%	1	1%	0	0%	0	0%	0	0%	0	0%
No anti-worm	838	100%	38	100%	141	99%	20	100%	37	100%	144	100%	30	100%
Anti-worm per age														
<=1 year	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
>1 en <5 years	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
<5 years	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
>=5 en <=10 years	3	1%	0	0%	1	1%	0	0%	0	0%	0	0%	0	0%
>10 years	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%

	Kimarek school		**Kimarek village**		**Nakuru Remand home**		**Nakuru Womans Prison**		**St Peters School**		**St Peters village**	
	Total= 140		**Total= 28**		**Total= 30**		**Total= 20**		**Total= 194**		**Total= 19**	
	N	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Anti-worm	1	1%	0	0%	0	0%	0	0%	1	1%	0	0%
No anti-worm	139	99%	27	96%	30	100%	20	100%	193	99%	19	100%
Anti-worm per age												
<=1 year	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
>1 en <5 years	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
<5 years	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%

>=5 en <=10 years	1	1%	0	0%	0	0%	0	0%	1	1%	0	0%
>10 years	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%

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. At all the visited schools we tried to explain to the teachers and people in charge why this deworming is so important for the children.

4: Pneumonia: (3/842, <1%) (see table appendix)
"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).
The 7 children with a severe acute respiratory infection (ARI) were treated with appropriate antimicrobials and home treatment advice. We saw 4 children with astma/bronchitis. If needed these children were treated with ventolin on the spot and were given instructions about the use of inhalers. In case of babies the mothers were instructed how to use the babyhaler. The SFFC will provide follow up visitis.

5: Cardial problems: (4/842, 1 %) (see table 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 1 girl of having a new pathological heart murmur. All the new and old cardiac kids together with their caretakers received extra information about their conditions. The children and their care takers 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. These children were transferred to the Coptic Hospital in Nairobi with a clinical suspicion of severe congenital defect. If necessary we will provide costs for treatment with the NIeuwendijk Foundation. We did a follow up for all the cardiac children from previous years and provided medication and treatment as needed.

6: Skin diseases: (84/842, 8%)(see table 1of the appendix)
This year we saw 24 (64/842, 8%) children with dermatomycoses including tinea capitits; the first time in the last 3 years we see a decline. This could be due to the fact that we only treat tinea capitis with systemic

treatment in case of severe disease (> 50% of head affected, or severe syperinfections or growth disorders). We sas 10 children with scabies (2%) and treated 7 children with ivermectin for scabies .

We accept a certain degree of underscoring. As tinea capitis is widespread in the schools due to transmission of the fungus bij razorblade and other factors, we only reported and treated the serious cases.

Antifungal cream (eventually in combination with hydrocortison) was given for fungal infections (dermatomycosis) and hydrocortison crème was given for different forms of skin disorders. We did treat the children with severe or infected forms of tinea capitis with griseofulvin.

The reported incidence of skin related problems is stable. We interpreted this as a good sign as we do see a lot on newcomers in our medical camp each year. The awereness at the schools, especially the SFFC schools, for hygiene, sanitation and healthy food could also have an impact here.

7: Dental: (caries not otherwise specified:130 /842, 15%; painful caries: 29/842, 3%)
In general a high caries prevalence was found. Our reported incidence of 3 % for painfull caries is low. This is due to underscoring. We still see a need for a dental camp en will try to bring our dentis with us next year.

At the last station of the medical carroussel local volunteers gave out toothbrushes and educated the children and their caretakers in teethbrushing.

After starting the brush at school prograam in 2015 in Kimarek and St.Peters, we were happy to see that the schools were still brushing the teeth in the classes. The aim of this project is that all children have their own toothbrush at school. And the whole school brushes their that at school together with the teachers. Washing hands and hygiene is also part of the programm.

We as MCC provided education, instruction folders, brush posters and tooth brushes for the schools. The folders and posters were based on the program developed by NIOSH. The SFFC provided the tooth brush holders for each classroom. In these schools we organized a meeting with all the teachers and selected students who were then in charge of training their classes. The SFFC still does follow-up visits in the classrooms during their montly visits.

8: Other

Further recommendations

Deworming
This year most children of the SSFC schools did receive the antiworm tablet. These tablets were from the MCC/SSFC stock. Unfortunately, the outreach from the govermental programm still appears to differ greatly between locations. If we look at the date from the last 3 years we do see a negative trend.

We need to establish a structure were at least in the SFFC schools the coverage of this profylactic antiworm programme is 100%!

We still recommened to contact the local healthclinics or hospitals responsible for the governmental deworming programme locally and make sure all children of the SSFC schools are reached by this programme.

E.g., is it possible for the teachers to get the albendazol directly from the health clinics for distribution? Or should the SFFC coordinate the twice annual distribuation of the antiworm pills?

Nutrition
The incidence of growth disorders seems to be stable when we compare the results to the results of the last 3 years. The schools were the SFFC has a feeding programm showns an even lower incidence rate of severe growth abnormalities. The anemia rates are stable also in the schools were the SFFC has a feeding programm. Like discussed during the medical camp the young newcommers in the nursery and baby classes seem to have a poor nutrutional state when entering the school. During the years they will benefit the most from the feeding programm.
We would encourange SFFC to proceed with the food programmes at the schools and nurseries.
There is a need for further education about nutrition and healthy living for teachers and health workers.

Cardiac problems

Every year we see children with suspected pathological heartproblems. In Kenya there is not any govermental programm for these needy children and the cost of medication and operations fall to their parents.

Heart operations are expensive (KS 100.000) and need extensive follow-up and chronic medication.

In the area of Njeri there is an ngo for heart children Ndugu Zangu who works together with a dutch ngo Heart for a Child's heart. We are trying to find a way to work together.

Skin disorders
Fungal infections of the head are still common. Although the reported incidence is dropping through the years. A probable cause could be the govermental decreet for school children to shave their head. Unfortunately the fungus does spread through dirty razors. Is there a role the SFFC can play in this matter? Is it possible to provide clean razor blades?

In general we see a lot of children with dirty skin due to poor hygenic conditions. This poses a risk for getting skin infections. We do know that water is a problem but should stress that children should clean dirty wounds with water to prevent more serious infections.

Is there a rol a town nurse or dedicated teacher can play in hygiene and wound matters?
Are there local believes about skin and wounds we are not aware of?

Teeth
During the years we've seen a lot of children with dental problems. The last dental camp in Western Kenya has been some years ago. We need to make a sustainable plan for the dental care in the areas were the SFFC works. At the moment we are only able to referr children with painfull caries at an adhoc basis. This

means only children with pain are being transported to a dental clinic were we pay the full costs. Is there a way to have a more proactive dental plan in the areas were the SFFC works?
This year we were able to raise enough toothbrushes for the brush programm in 2017.

There is also a need for further education of teachers and healthcare workers on the importance of this subject and the role it has in the general health of the children.

Health and Hygiene
In general we notice that knowledge about what is good health and hygiene among children, caretakes and sometimes even teachers is little.

To change the first step is education. Does the SFFC think there is a need for education about food safety, clean water, cleanliness, fit for school and fit for life subjects?

Last words:
Thanks to the amazing support from Marina, Matt, Tazos and Noppi from the Sophia Foundation we were able to give a lot of children their share of medical care and personal attention. We all felt to be part of one big team and all teammembers expressed the wish to come back again next year.

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Appendix A Disease prevalence among all children per geographical location

	Total		Home Welcome		Kamalabei school		Kamalabei village		Kesengei baby		Kesengei school		Kesengei village	
	842		Total= 38		Total= 142		Total= 20		Total= 37		Total= 144		Total= 30	
	N	%	n	%	n	%	n	%	n	%	n	%	n	%
Underweight	73	9%	0	0%	9	6%	3	15%	5	14%	31	22%	5	17%
Stunting	48	6%	9	24%	4	3%	2	10%	2	5%	7	5%	6	20%
Wasting	76	9%	0	0%	17	12%	3	15%	10	27%	23	16%	3	10%
Anaemia	225	27%	13	34%	25	18%	7	35%	10	27%	47	33%	9	30%
vitamin deficit (clinical signs)	5	1%	0	0%	0	0%	0	0%	1	3%	4	3%	0	0%
syndrome n.o.s.	2	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
pneumonia (clinical)	3	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
BHR/asthma	2	0%	0	0%	1	1%	0	0%	0	0%	0	0%	0	0%
dysenteria	1	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
diarrhoea without dehydration	2	0%	0	0%	0	0%	1	5%	0	0%	0	0%	0	0%
active worm infection	6	1%	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%
otitis media acuta	1	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
otitis externa	6	1%	0	0%	0	0%	1	5%	0	0%	0	0%	1	3%
candida stomatitis	1	0%	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%
hearing impairment	1	0%	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%
cariës n.o.s.	130	15%	12	32%	14	10%	0	0%	6	16%	34	24%	0	0%
pain n.o.s	1	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
caries with pain	29	3%	2	5%	5	4%	0	0%	0	0%	7	5%	0	0%
wounds n.o.s.	3	0%	0	0%	1	1%	0	0%	0	0%	1	1%	0	0%
eczema n.o.s.	5	1%	0	0%	2	1%	1	5%	0	0%	0	0%	0	0%
dermatomycosis	64	8%	1	3%	7	5%	2	10%	4	11%	12	8%	2	7%
Impetigo/furunculosis	4	0%	0	0%	1	1%	0	0%	0	0%	1	1%	1	3%
lice	2	0%	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%
scabies	10	1%	0	0%	2	1%	0	0%	1	3%	2	1%	0	0%
wounds infected,	8	1%	0	0%	4	3%	0	0%	0	0%	2	1%	0	0%
other (psoriasis etc)	2	0%	1	3%	0	0%	0	0%	0	0%	0	0%	0	0%
psychomotoric retardation	3	0%	0	0%	0	0%	1	5%	0	0%	0	0%	1	3%
epilepsy	1	0%	0	0%	0	0%	0	0%	1	3%	0	0%	0	0%

spina bifida	1	0%	0	0%	0	0%	0	0%	0	0%	0	0%	1	3%
physiological murmer	2	0%	0	0%	2	1%	0	0%	0	0%	0	0%	0	0%
pathological murmur (suspected)	2	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
refractory problem	1	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
keratoconjunctivitis	1	0%	0	0%	1	1%	0	0%	0	0%	0	0%	0	0%
new fracture	1	0%	1	3%	0	0%	0	0%	0	0%	0	0%	0	0%

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	Kimarek school		Kimarek village		Nakuru Remand home		Nakuru Womans Prison		St Peters School		St Peters village	
	Total = 140		Total = 28		Total = 30		Total = 20		Total = 194		Total = 19	
	n	%	n	%	n	%	n	%	n	%	N	%
Underweight	8	6%	3	11%	0	0%	4	20%	4	2%	1	5%
Stunting	8	6%	3	11%	4	13%	3	15%	0	0%	0	0%
Wasting	9	6%	3	11%	0	0%	1	5%	6	3%	1	5%
Anaemia	41	29%	8	29%	0	0%	7	35%	51	26%	7	37%
vitamin deficit (clinical signs)	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
syndrome n.o.s.	0	0%	0	0%	0	0%	0	0%	2	1%	0	0%
pneumonia (clinical)	0	0%	1	4%	0	0%	0	0%	0	0%	2	11%
BHR/asthma	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%
dysenteria	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%
diarrhoea without dehydration	0	0%	0	0%	0	0%	1	5%	0	0%	0	0%
active worm infection	1	1%	0	0%	0	0%	0	0%	4	2%	0	0%
otitis media acuta	0	0%	0	0%	0	0%	0	0%	0	0%	1	5%
otitis externa	2	1%	1	4%	0	0%	0	0%	1	1%	0	0%
candida stomatitis	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
hearing impairment	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
cariës n.o.s.	14	10%	0	0%	19	63%	0	0%	30	15%	1	5%
pain n.o.s	1	1%	0	0%	0	0%	0	0%	0	0%	0	0%
caries with pain	6	4%	1	4%	0	0%	0	0%	7	4%	1	5%
wounds n.o.s.	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%
eczema n.o.s.	1	1%	0	0%	0	0%	1	5%	0	0%	0	0%
dermatomycosis	18	13%	1	4%	1	3%	0	0%	14	7%	2	11%
Impetigo/furunculosis	1	1%	0	0%	0	0%	0	0%	0	0%	0	0%
lice	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%
scabies	3	2%	1	4%	0	0%	0	0%	1	1%	0	0%
wounds infected,	0	0%	1	4%	0	0%	0	0%	1	1%	0	0%
other (psoriasis etc)	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%
psychomotoric retardation	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%
epilepsy	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
spina bifida	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
physiological murmer	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
pathological murmur (suspected)	2	1%	0	0%	0	0%	0	0%	0	0%	0	0%
refractory problem	1	1%	0	0%	0	0%	0	0%	0	0%	0	0%
keratoconjunctivitis	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
new fracture	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%

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Appendix C: Treatment among all children per geographical location

	Total		Home Welcome		Kamalabei school		Kamalabei village		Kesengei baby		Kesengei school		Kesengei village	
	842		Total= 38		Total= 142		Total= 20		Total= 37		Total= 144		Total= 30	
	N	%	n	%	n	%	n	%	n	%	n	%	n	%
ferro	143	17%	5	13%	21	15%	3	15%	7	19%	31	22%	3	10%
mother iron	12	1%	0	0%	0	0%	5	25%	0	0%	0	0%	2	7%
multivitamins	155	18%	11	29%	20	14%	5	25%	11	30%	44	31%	7	23%
anti-worm	765	91%	37	97%	141	99%	11	55%	35	95%	132	92%	21	70%
acute worm	19	2%	0	0%	1	1%	0	0%	1	3%	5	3%	1	3%
anti-scabies	7	1%	0	0%	2	1%	0	0%	1	3%	1	1%	0	0%
amoxicillin	6	1%	0	0%	1	1%	0	0%	0	0%	1	1%	0	0%
2e lijns antibiotica	2	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
eardrops	5	1%	0	0%	0	0%	1	5%	0	0%	0	0%	1	3%
nystatine	3	0%	0	0%	0	0%	0	0%	0	0%	2	1%	0	0%
hydrocortisone cream	3	0%	0	0%	1	1%	1	5%	0	0%	0	0%	0	0%
dactarin cream	31	4%	1	3%	4	3%	1	5%	0	0%	5	3%	1	3%
dactacort cream	7	1%	0	0%	0	0%	1	5%	1	3%	1	1%	2	7%
fusidin cream	13	2%	1	3%	3	2%	0	0%	0	0%	2	1%	0	0%
sudo cream	1	0%	0	0%	1	1%	0	0%	0	0%	0	0%	0	0%
neutral cream	2	0%	0	0%	1	1%	0	0%	0	0%	0	0%	0	0%
eyedrops	1	0%	0	0%	1	1%	0	0%	0	0%	0	0%	0	0%

	Kimarek school		Kimarek village		Nakuru Remand home		Nakuru Womans Prison		St Peters School		St Peters village	
	Total= 140		Total= 28		Total= 30		Total= 20		Total= 194		Total= 19	
	n	%	n	%	n	%	n	%	n	%	n	%
ferro	32	23%	5	18%	0	0%	1	5%	30	15%	5	26%
mother iron	0	0%	1	4%	0	0%	4	20%	0	0%	0	0%
multivitamins	19	14%	6	21%	3	10%	8	40%	18	9%	3	16%
anti-worm	136	97%	21	75%	30	100%	6	30%	184	95%	11	58%
acute worm	3	2%	0	0%	0	0%	1	5%	7	4%	0	0%
anti-scabies	2	1%	0	0%	0	0%	0	0%	1	1%	0	0%
amoxicillin	0	0%	1	4%	0	0%	0	0%	0	0%	3	16%
2e lijns antibiotica	0	0%	0	0%	0	0%	1	5%	1	1%	0	0%
eardrops	2	1%	0	0%	0	0%	0	0%	1	1%	0	0%
nystatine	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%
hydrocortisone cream	0	0%	1	4%	0	0%	0	0%	0	0%	0	0%

dactarin cream	9	6%	0	0%	1	3%	0	0%	9	5%	0	0%
dactacort cream	0	0%	0	0%	0	0%	0	0%	1	1%	1	5%
fusidin cream	2	1%	1	4%	0	0%	0	0%	3	2%	1	5%
sudo cream	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
neutral cream	0	0%	0	0%	0	0%	1	5%	0	0%	0	0%
eyedrops	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%

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Appendix D Follow up

	Total		Home Welcome		Kamalabei school		Kamalabei village		Kesengei baby		Kesengei school		Kesengei village	
	842		Total= 38		Total= 142		Total= 20		Total= 37		Total= 144		Total= 30	
	N	%	n	%	n	%	n	%	n	%	n	%	n	%
Dentist	25	3%	2	5%	2	1%	0	0%	1	3%	7	5%	0	0%
Specialist in hospital	4	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Revisit	1	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Bloodtest after 3 months	6	1%	0	0%	1	1%	0	0%	0	0%	1	1%	0	0%
International organisation	9	1%	0	0%	1	1%	0	0%	1	3%	3	2%	1	3%
Other…	1	0%	0	0%	1	1%	0	0%	0	0%	0	0%	0	0%

	Kimarek school		Kimarek village		Nakuru Remand home		Nakuru Womans Prison		St Peters School		St Peters village	
	Total= 140		Total= 28		Total= 30		Total= 20		Total= 194		Total= 19	
	N	%	n	%	n	%	n	%	n	%	n	%
Dentist	7	5%	0	0%	0	0%	0	0%	6	3%	0	0%
Specialist in hospital	2	1%	0	0%	0	0%	0	0%	2	1%	0	0%
Revisit	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%
Bloodtest after 3 months	0	0%	0	0%	0	0%	0	0%	3	2%	1	5%
International organisation	0	0%	1	4%	0	0%	0	0%	2	1%	0	0%
Other…	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%