Medical Checks for Children

Medical Report

Kolkata 2016

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I Introduction

From the 14th to 20th of February 2016, our Medical Checks for Children (MCC) team visited for the third year in a row three locations namely Raghunathpur, Joynagar and Bhagawatipur in the West Bengal region, South of Kolkata, India, to conduct a medical health camp. This year a new location Sibnagar, in the South of the Sunderban region, was visited as well. We checked and treated 968 children on the spot, aged between 0 and 12, free of cost at above mentioned locations. The main group of children was between 3 and 9 years of age.

The team stayed 5 nights in the Punyalakshmi Hotel in Diamond Harbour, South of Kolkata, on the banks of the Hooghly River, quite near where the river meets the Bay of Bengal. Diamond Harbour is a day trip away from inner city Kolkata and depending on road and traffic conditions it takes 2 to 3 hours to reach. The team stayed 1 night at the guesthouse of the school in Bhagawatipur.

This year's free medical campaign of MCC location Kolkata region, West Bengal was the third medical mission, organized in mutual cooperation/collaboration and with financial support of the Dutch NGO FEMI (point of contact Mr Leo Verzijl) and the Indian NGO Young Men's Welfare Society, led by the honourable Mr Shourabh Mukherji.

The Young Men's Welfare Society was founded in 1976 with the blessings and patronage of Nobel Laureate Late Mother Teresa. His Holiness the Dalai Lama came to Kolkata on the 15th January 2007 and inaugurated their 40th anniversary celebrations. YMWS has until date provided pre-primary and primary education to 65,000 under-privileged children. After 30 years of focusing on education, Mr Mukherji thought the time was there to broaden this focus to health.

The children we checked are attending pre-primary (nursery) and primary schools in the underprivileged rural areas in the West Bengal, District South 24 Parganas, and have limited access to medical facilities. Next to governmental facilities and private doctors, especially in the West Bengal there is a parallel health care market: Rural Medical Practitioners (RMP) often practice modern allopathic medicine without any formal training ('quacks'). In rural outpatient care, the RMPs are most prominent. The website www.futurehealthsystems.org states: "The source of main treatment for the local population is private formal 22%, government 12%, NGO2%, and RMP 64%. RMP's have knowledge on common disease treatment procedure and medicines, but their major threat is rampant, indiscriminate use of antibiotics."

Medically, 40 to 60 % of the children in South 24 Parganas district receive their full vaccinations, and apart from the local community centres no other medical organization is involved in the region we checked. Family physician and homeopath Dr Chandra has been working twice a week in the region for the last four years and directly takes care of the sick village men, women and children. The nearest hospitals in the area are Kulpi Hospital, with a travelling time of approximately 40 minutes, and the Hospital in Diamond Harbour (30 minutes). In Siddhiberia, Chamnabuni, Chunfuli and Himli there are special facilities for disabled children. The Sundarban Social Development centre in Polerhat has working relations with the Special Nutrition Hospital for malnourished children and contact with the Eye Hospital.

The Dutch team of 2016 consisted of Ilse Westerbeek (paediatrician and organizational/medical mission leader), Minke Huibers (paediatric resident and medical mission leader), Renée van Hoof (Master student International Public Health and organizational mission leader), Claasje van der Zwet (general practitioner), Nicole van Buuren (general practitioner), Caroline de Wit (Ear-Nose-Throat resident), Lieke Uyterschout (paediatric resident), Noor Wehmeijer (medical doctor), Judith Serrarens (dermatologist), Marjolijn Oomens (Dentist) and Mecheline Ruijs (Neurologist).

Technical equipment, toothbrushes, spectacles and gifts for the children and some of the medical supplies were brought from the Netherlands by the team members. All of the medication was ordered through Ms Tapolina Banerjee (YMWS) and Minke Huibers (MCC) from Singh pharmacy, Diamond Harbour. Direct contact person is the Mr. Singh. Singh pharmacy was very helpful in supplying the (extra) medication.

Support from the local YMWS organizing committee consisted of the following (amongst others):

- Selection of the check locations
- Selection of the children to be checked, each accompanied by a caregiver.
- Information transmittance to the local communities.
- Organizing all the different stations of the carousel
- Arranging plentiful and competent translators /support volunteers
- Arranged a good hotel for all MCC team members and a very nice stay for 1 night at the guesthouse of the school in Bhagawatipur.
- Transportation of the MCC team to the check locations.
- Providing the food on the check locations
- Prior announcement of the medical campaign on the locations.
- Giving support in ordering and delivering the medication.
- Giving support to the MCC team during the medical campaign.

The whole team during the checks consisted of the YMWS management team Ms Tapolina Banerjee, Mr Dhiraj Kanti Mondal (Assistant Headmaster of high school), Ms Chandra Ray (Headmistress), our Indian colleague, Doctor B. Chandra (family physician and homeopath), and the 11 Dutch team members accompanied by a daily changing number of Indian support volunteers/translators and drivers. In total the multidisciplinary team during the check week consisted of roughly 50 members on all the different locations combined, who performed the children's medical health campaign within the three blocks of South 24 Parganas district.

The MCC team was very happy with the cooperation with the local organizer YMWS, and the active, direct support and enthusiasm of the local volunteers who gave MCC the opportunity to work in West Bengal and to facilitate all aspects of the medical campaign.

II Medical Checks for Children on location, content of the medical camp

During the week, MCC checked 968 children at three different locations within District South 24 Parganas, West Bengal. Specifics on number of location are shown in table 1.

Table1: Number of checked children per day and geographical location

	15-02-16	16-02-16	17-02-16	18-02-16	19-02-16	20-02-16	Total
BH	0	0	0	0	0	143	143
Joy	0	0	185	0	0	0	185
RGH	184	181	0	0	0	0	365
Sun	0	0	0	136	138	0	275
Total	**184**	**181**	**186**	**136**	**138**	**143**	**968**

BH: Bhagawatipur, Joy: Joynagar, RGH: Raghunathpur, Sun: Sundarbans

The children were seen free of cost at the MCC carousel, which consists of the following stations:

1. Registration
2. Parent education*
3. Height and weight (saturation occasionally)
4. Blood test (haemoglobin)
5. Physical examination
6. Distribution of medication (pharmacy)**
7. Education on hygiene, tooth brushing and hand washing***
8. On indication: Dental check-up by local and Dutch dentist****
9. On indication: referral****

N.b.
* Station 2: these interactive sessions with parents of caregivers was a new addition in the carrousel of 2016.
** Station 6: next to the distribution of medication to the indicated children, those not in need of any medication received a health certificate
*** Station 7: a toothbrush was given to each child.
*** Station 8: in collaboration with a local dentist the dentist checked the teeth and if necessary and with permission of the parent tooth extraction was done.
****Station 9: On indication children were referred to the hospital for extra blood test/ ECG/ X-ray.

Furthermore, a health workshop for local teachers and volunteers was added to the camp of 2016. During the medical check-ups and workshops, special attention was paid to issues of hygiene, nutritional advice, and tooth brushing, see Attachment 5.

Data collection
If the children had been checked previous years, the children received the CRF forms of the previous year(s) at registration (station 1). Anthropometric measurements were recorded (station 3), and a finger prick sample was taken to determine the haemoglobin (Hb) concentration (station 4).

A clinical doctor examined each child. History of illnesses in the preceding weeks was recorded. Specifically, caregivers were asked if the child had fever, respiratory infection, diarrhoea, vomiting, eating soil (pica), decreased appetite, weight loss or pain. They were also asked if their child had received prior treatment, especially deworming within the last half year, iron or multivitamin supplementation or antibiotics. If the child was also seen in the previous years, results of the last years were compared (all station 5).

At the end of the MCC carousel, the data of the checked children were entered into a database, which made it possible to gain preliminary insights into the health of that day's children population every evening and to compare this with previous years. Furthermore every day the team had a short evaluation of the day to improve logistics for them next day.

III General diagnoses and categories of ailments/treatment and referrals

The four schools are YMWS teaching schools, which open their doors to disadvantaged and marginalized communities. They offer safe, clean environments; proper toilets, drinking water and the locations of Bhagawatipur and Joynagar have a kitchen garden with delivery of 1 breakfast a day for the schoolchildren consisting mainly of 1 egg, milk and a banana. Though in general the primary focus of MCC as an organisation is on 0 to 5 year old, the focus during this medical camp was on checking vulnerable nursery and school children up to 9 years old. Of all checked children, 39 % (n=374) of the children were under 5 years old, with 59 % (n=567) children 5 to 10 years old and only 3 % (n=27) were above 10 years. Age specifics by school are shown in table 2.

The overall child health status of the children was slightly poor, with a high percentage of 27% underweight, 11% wasting and 18% stunting, 30 % anaemia and 34% caries.

Table 2: Summary of checked children per geographical location, age and gender
BH: Bhagawatipur, Joy: Joynagar, RGH: Raghunathpur, Sun: Sundarbans

	Total		**BH**		**Joy**		**RGH**		**Sun**	
	968		**Total= 143**		**Total= 185**		**Total= 365**		**Total= 275**	
Age	**N**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
<=1 year	4	0%	0	0%	0	0%	0	0%	4	1%
>1 en <5 years	370	38%	86	60%	101	55%	116	32%	67	24%
<5 years	374	39%	86	60%	101	55%	116	32%	71	26%
>=5 en <=10 years	567	59%	57	40%	84	45%	249	68%	177	64%
>10 years	27	3%	0	0%	0	0%	0	0%	27	10%
Gender										
Boy	510	53%	75	52%	90	49%	187	51%	158	57%
Girl	458	47%	68	48%	95	51%	178	49%	117	43%

Table 3: Disease prevalence among all children per geographical location BH: Bhagawatipur, Joy: Joynagar, RGH: Raghunathpur, Sun: Sundarbans

	Total		**BH**		**Joy**		**RGH**		**Sun**	
	968		**Total= 143**		**Total= 185**		**Total= 365**		**Total 275**	
	N	**%**	**N**	**%**	**n**	**%**	**n**	**%**		
Underweight	261	27%	15	10%	56	30%	139	38%	51	19%
Stunting	172	18%	16	11%	44	24%	73	20%	39	14%
Wasting	94	11%	10	7%	31	17%	44	15%	9	4%
Anaemia	292	30%	56	39%	92	25%	57	31%	87	32%

BH: Bhagawatipur, Joy: Joynagar, RGH: Raghunathpur, Sun: Sundarbans

The main alleged causes were water borne diseases, gastro-intestinal infections, worms, skin problems, urine tract infection, otitis media, cough without fever and abdominal pain. Dermatomycosis and infected wounds were also a common clinical finding. Most of the ailments could be treated on the spot. Main treatments on the spot were prominently directed to secondary prevention, with iron supplementation, multivitamin supplementation, and deworming as well as active treatment of worm infections.

In total 12 children were referred to the outpatient department of the local hospital (in Diamond Harbour) for further diagnostics or specialist consult. Results of laboratorial investigation, ECG and echo cardiology will be collected by YWS, Mr Chandra and results will be reported.

Table 4: Treatment among all children per geographical location

	Total		**BH**		**Joy**		**RGH**		**Sun**	
	968		**Total= 143**		**Total = 185**		**Total = 365**		**Total= 275**	
	N	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
ferrosulphate	41	4%	10	7%	2	1%	9	2%	20	7%
multivitamins	473	49%	63	44%	91	49%	200	55%	119	0%
anti-worm	622	64%	74	52%	128	69%	225	62%	195	43%
acute worm	326	34%	68	48%	55	30%	130	36%	73	71%
anti-lice	2	0%	0	0%	2	1%	0	0%	0	27%
anti-scabies	4	0%	0	0%	0	0%	1	0%	3	0%
amoxicillin	28	3%	0	0%	6	3%	13	4%	9	1%
metranidazol	31	3%	5	3%	7	4%	15	4%	4	0%
co-trimoxazol	6	1%	0	0%	2	1%	3	1%	1	3%
paracetamol	10	1%	5	3%	5	3%	0	0%	0	0%
eardrops	14	1%	5	3%	0	0%	3	1%	6	0%
hydrocortisone cream	23	2%	8	6%	4	2%	5	1%	6	1%
dactarin cream	23	2%	7	5%	4	2%	6	2%	6	0%
dactacort cream	4	0%	0	0%	1	1%	2	1%	1	0%
fusidin cream	19	2%	2	1%	1	1%	3	1%	13	0%
eyedrops	2	0%	0	0%	0	0%	2	1%	0	0%

N. B. BH: Bhagawatipur, Joy: Joynagar, RGH: Raghunathpur, Sun: Sundarbans

Table 5: Follow-up of all children per geographical location

	Total		**Bhaga**		**Joy**		**RGH**		**Sun**	
	968		**Total= 143**		**Total= 185**		**Total= 365**		**Total= 275**	
	N	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Dentist	96	10%	16	11%	26	14%	49	13%	5	2%
Specialist in hospital	14	1%	2	1%	3	2%	3	1%	6	2%
Revisit	89	9%	9	6%	19	10%	32	9%	29	11%
X-thorax	0	0%	0	0%	0	0%	0	0%	0	0%
ECG	3	0,3%	0	0%	1	1%	1	0,3%	1	0,4%

IV Specific diagnoses and categories of ailments/treatment and referrals

The checked children showed significant levels of malnutrition with 27% underweight, 18% wasting and 11% stunting.

Malnutrition

Malnutrition is thought to account for one third of all deaths of children under five (UN Millennium Development Goals). 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 of death. The main factors contributing to malnutrition in West Bengal are rural poverty, lack of sanitation, poor living conditions, child labour and a lack of energy, protein intake, iron and multivitamins. In a study in 2010 published by Bharati in the Asian Pacific Journal of Tropical medicine (April 2010, 322-327) a very high prevalence of underweight was reported in South 24 Parganas. On average more underweight children were seen in rural areas among Muslim families with illiterate parents and low living conditions. These characteristics like parents' educational status and standard of living show significant effect on children's weight.

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.

- Wasting = weight for height at or under the third percentile of the reference population (WHO growth curves), only children up to 120 cm in height. This is an indicator of acute malnutrition.

- Stunting = 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.

It should be noted that reference data were only available for certain heights, weights and ages (as specified above), leading to the following general prevalence of growth abnormalities in the communities we visited, Table 6.

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

	Total		BH		Joy		RGH		Sun	
	968		Total= 143		Total= 185		Total= 365		Total = 275	
	N	%	n	%	n	%	n	%	n	%
Underweight	261	27%	15	10%	56	30%	139	38%	51	19%
No underweight	703	73%	128	90%	129	70%	226	62%	220	81%
Unknown	4	0%	0	0%	0	0%	0	0%	4	1%
Underweight children per age										
<=1 year	0	0%	0	0	0	0	0	0	0	0%
>1 en <5 years	76	21%	8	9%	31	31%	32	28%	5	7%
<5 years	76	20%	8	9%	31	31%	32	28%	5	7%
>=5 en <=10 years	179	32%	7	12%	25	30%	107	43%	40	23%
>10 years	6	25%	0	0	0	0	0	0	6	25%
Underweight children per gender										
Boy	143	28%	10	13%	27	30%	73	39%	33	21%
Girl	118	26%	5	7%	29	31%	66	37%	18	16%

BH: Bhagawatipur, Joy: Joynagar, RGH: Raghunathpur, Sun: Sundarbans

Table 7: Prevalence of length/age at or under P3 (stunting) per geographical location by age and gender

	Total		**Bhaga**		**Joy**		**RGH**		**Sun**	
	968		**Total = 143**		**Total= 185**		**Total= 365**		**Total= 275**	
	N	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Stunting	172	18%	16	11%	44	24 %	73	20 %	39	14%
No stunting	795	82%	127	89%	141	76 %	292	80 %	235	86%
Unknown	1	0%	0	0%	0	0%	0	0%	1	0%
Stunting children per age										
<=1 year	0	0%	0	0	0	0	0	0	0	0%
>1 en <5 years	84	23%	10	12%	26	26 %	30	26 %	18	27%
<5 years	84	22%	10	12%	26	26 %	30	26 %	18	25%
>=5 en <=10 years	81	14%	6	11%	18	21 %	43	17 %	14	8%
>10 years	7	27%	0	0	0	0	0	0	7	27%
Stunting children per gender										
Boy	90	18%	10	13%	18	20 %	42	22 %	20	13%
Girl	82	18%	6	9%	26	27 %	31	17 %	19	16%

BH: Bhagawatipur, Joy: Joynagar, RGH: Raghunathpur, Sun: Sundarbans

Table 8: Prevalence of weight/length at or under P3 (wasting) per geographical location by age and gender

	Total		BH		Joy		RGH		Sun	
	968		Total = 143		Total= 185		Total= 365		Total= 275	
	N	%	n	%	n	%	n	%	n	%
Wasting	94	11%	10	7%	31	17 %	44	15 %	9	4%
No wasting	739	89%	131	93%	154	83 %	255	85 %	199	96%
Unknown	135	14%	2	1%	0	0%	66	18 %	67	24%
Wasting children per age										
<=1 year	0	0%	0	0	0	0	0	0	0	0%
>1 en <5 years	34	9%	7	8%	19	19 %	6	5%	2	3%
<5 years	34	9%	7	8%	19	19 %	6	5%	2	3%
>=5 en <=10 years	60	13%	3	5%	12	14 %	38	21 %	7	5%
>10 years	0	0%	0	0	0	0	0	0	0	0%
Wasting children per gender										
Boy	43	10%	5	7%	13	14 %	20	14 %	5	4%
Girl	51	13%	5	7%	18	19 %	24	16 %	4	4%

BH: Bhagawatipur, Joy: Joynagar, RGH: Raghunathpur, Sun: Sundarbans

Severe malnutrition and followup

In total 38 childeren need to have a followup because of sever malnutriton.Table 9. Ten of them are very severe. These include 2% of the children in Bhagawatipur, 8.6% of the children inJoynagar, 3.6 % chidren in Raghunathpur, and 2% children in Sunabuns. The specific MCC numbers for are lised in attachement 4.

Table 9 children in need of follow-up because of malnutrition.

		BH		Joy		RGH		Sun	
		Number	%	Number	%	Numer	%	Numbe r	
In need follow-up because of malnutrition.	No	140	97,9%	169	91,4%	352	96,4%	269	9
	Yes	3	2,1%	16	8,6%	13	3,6%	6	

BH: Bhagawatipur, Joy: Joynagar, RGH: Raghunathpur, Sun: Sundarbans

Anaemia

The checked children showed significant levels of malnutrition, with 30 % suffering from anaemia (see Table 10). Compared with last year (2015) this is a decline, where last year 50% of all children had anaemia. The findings of malnutrition were discussed in 2014 en 2015 with YMWS and they started a food program in January 2015 at the school in BH and RAG and they are planning to start the food program at the other schools as well. The food program consists of daily 1 egg, 1 banana and a glass of milk.

It is estimated that globally 47% of preschool children are anaemic and around 50-60 % of anaemia cases are due to iron deficiency (The Lancet 2008, 371:243-260). In some poor developing countries, the prevalence of anaemia is over 60%. The extent to which iron deficiency may effect children's development has major implications both for the individual and national development. Iron deficiency is associated with many psychosocial and economic disadvantages that can affect child development. There is evidence of changes to brain function in infants with iron deficiency anaemia. Children with iron deficiency anaemia generally come from poor socioeconomic backgrounds, which could account for some or all deficits.

The prevalence of anaemia in Bhagawatipur checked was high (39 %). The anaemia is largely attributable to poor dietary quality (diets low in key nutrients) and disease/worm loads. A total of 6 children showed a haemoglobin level below 5.0 mmol/l. 2 children had a B-thalassemia major disease, one was known with a X-thalassemia treat. We provided information about this medical condition. A total of 4 of these children (including the one with known Thalassemia were living in the Sundarbans. We were told by local health worker that Thalassemia is prevalent on the Sundarbans.

In West Bengal there is no national policy to provide iron supplements to pregnant women and young children up to 5 years of age. While iron deficiency is frequently the primary factor contributing to anaemia, it is important to recognize that the control of anaemia requires a multi-faceted approach, which, through integral interventions, addresses the various factors that play a significant role in producing anaemia in a given community. In addition to iron deficiency, another big problem is worm infections. The Sundarbans do know a local policy for iron supplements for pregnant woman and young children up to 5 years of age provided by local public health nurses.

We treated the children with anaemia (< 6 gram/dl) and no infection or growth abnormality with iron supplements for three months. Therapeutic supplementation is generally intensive, 1-3 mg /kg/day, but of limited duration and directed at correcting iron deficiency anaemia. Mild anaemia (>6 gram/dl) was mostly treated with multivitamins for 3 months. Exception were made in the Sundarbans. In the Sundarbans no iron supplementation was given to severe anaemia (Hb < 5 g/dl)

this because of high prevalence of thalassaemia. Children were send to hospital for conformation of diagnosis. Multivitamin in these cases was supplied.

Severe anaemia among children is not only due to iron deficiency, but also due to vitamins shortness and worm infections (Calis et al. (N Engl J Med 2008(9):888-99)). Treating anaemia with multivitamin supplementation also leads to reduction of anaemia in many cases. Furthermore, active worm infection together with iron therapy may have a counteractive effect. As many of the children with anaemia also suffered from active worms we decided to threat only the children with severe anaemia with iron. Mild anaemia was treated with multivitamins. Almost all children received active therapeutic anti-worm treatment.

As micronutrients play an important role in the control of anaemia. An increase in the consumption of iron, folate, vitamin B12 and vitamin C can lead to a decrease of anaemia. If iron supplementation had no potentially adverse effects, then universal supplementation or fortification would be the obvious recommendation. However, in iron-replete children there is a consistent evidence of a detrimental effect of giving iron on certain morbidities (diarrhoea and malaria) and on growth. Especially in infants adverse effects of iron are manifested by decreased growth. In well-nourished infants by reduced gain in length, in poor nourished infants by lower weight gain. The mechanism behind the decreased growth is not really known, but it may involve free radicals mediated effects of iron or an interaction with zinc absorption/homeostasis. It therefore seems that iron drops should not be given to iron-replete infants. Therefore, the benefits of supplementation have to be weighed against potential harm. Iron supplementation usually shows beneficial effects on motor development in children with iron deficiency anaemia less than 3 years, but the effect on mental development is not clear. Iron supplementation shows beneficial effects on cognitive function in children aged 3 years and older with iron deficiency anaemia. Safety issues can arise at the point of administration(dosage). It is clear that children should be treated for iron deficiency anaemia and prevented from getting it. General improvements to children's diets and prompt treatment of infections would be the first step to prevention. All interventions to control paediatric iron deficiency should be integrated into larger national and global health programs for pregnant women and children, including health education, malaria prevention, and deworming.

In summary: Children with iron deficiency anaemia are at risk of poor current and future motor and mental development and behavioural differences.

Table 10: Prevalence of anaemia per geographical location by age and gender

	Total		BH		Joy		RGH		Sun	
	968		Total= 143		Total= 185		Total= 365		Total= 275	
	N	%	n	%	n	%	n	%	n	%
Anaemia	292	30%	56	39%	57	31%	92	25%	87	32 %
No anaemia	571	59%	85	59%	126	68%	174	48%	186	68 %
Unknown	105	11%	2	1%	2	1%	99	27%	2	1%
Hb <5,0 mmol	6	1%	0	0%	0	0%	2	1%	4	1%
Anaemia per age										
<=1 year	0	0%	0	0	0	0	0	0	0	0%
>1 en <5 years	113	31%	33	38%	32	32%	19	16%	29	43 %
<5 years	113	30%	33	38%	32	32%	19	16%	29	41 %
>=5 en <=10 years	168	30%	23	40%	25	30%	73	29%	47	27 %
>10 years	11	41%	0	0	0	0	0	0	11	41 %
Anaemia per gender										
Boy	160	31%	31	41%	31	34%	53	28%	45	28 %
Girl	132	29%	25	37%	26	27%	39	22%	42	36 %

BH: Bhagawatipur, Joy: Joynagar, RGH: Raghunathpur, Sun: Sundarbans

Worm infection and treatment

This year anti-worm treatment was given by Abendazol 400 mg. The treatment for a active worm infection is hereby conform the treatment of prophylaxes (1 tablet 400 mg). A total of 42% of the children received in the last 6 months anti-worm treatment. Table 13.

Table 11: Prevalence preventive anti-worm treatment in the last half-year per geographical location by age and gender

	Total		BH		Joy		RGH		Sun	
	968		Total= 143		Total= 185		Total= 365		Total= 275	
	N	%	n	%	n	%	n	%	n	%
Anti-worm	404	42%	65	45%	77	42%	145	40 %	117	43 %
No anti-worm	529	55%	78	55%	89	48%	216	59 %	146	53 %
Anti-worm per age										
<=1 year	2	50%	0	0	0	0	0	0	2	50 %
>1 en <5 years	167	45%	38	44%	43	43%	45	39 %	41	61 %
<5 years	169	45%	38	44%	43	43%	45	39 %	43	61 %
>=5 en <=10 years	225	40%	27	47%	34	40%	100	40 %	64	36 %
>10 years	10	37%	0	0	0	0	0	0	10	37 %

BH: Bhagawatipur, Joy: Joynagar, RGH: Raghunathpur, Sun: Sundarbans

Of all the children we checked 42% had been given anti-worm prophylaxes within the last 6 months by the community health centre. Unfortunately the anti-worm tablet MCC left behind after the 2015 camp for prophylactic treatment 6 months after the checks in 2014 were not provided to the children.

In South 24 Parganas Ascaris worm (roundworm) is probably the most prevalent worm, next to T. Trichura (whipworm) and Necator americanus (hookworm). In this region the local community health centre operates an official anti-worm program. However it's unclear how many children are effectively reached by this bi-annual program in the different schools. 42% of the children were already dewormed; some of them were still treated for active worm infection. Children suffered from worm infections suffered from worm exiting in the stool, from the mouth and nose, abdominal pain, constipation, teeth grinding and diarrhoea. We think that all this complaints may be manifestations of active worm infections. Some of the children who said they had anti worm treatment were given homeopathic anti worm treatment and no Mebendazol or Abendazol in the last 6 months. Hereby suggestions can an made that as well ineffective effect homeopathic anti worm treatment could be one of the reasons of un going anti-worm infections.

To explore the gastrointestinal problems in more detail in 2015 stool samples were taken from 52 children with gastro-intestinal symptoms and analysed in collaboration with Mr dr. S. Ganguly M.Sc.

PhD, Senior Research Officer in Division of Parasitology, National Institute of Cholera and Enteric Diseases, Kolkata. 4/52 children had a giardia lamblia infection, 4/52 children had a Ascaris lumbricoides en 4/52 had worm infection (1 Hymenolepis nana, 1 enterobius vermicularis and 2 ascaris lumbricoides). We interpreted that the gastro-intestinal problems are also cause by giardia lamblia infections that should be treated with antibiotic instead of anti-worm treatment. Because of this results, this year we treated the children who mainly had symptoms of dysentery with metronidazol because of suspicion of giardia infection. In total 31 (3%) children were treated for Giardia lamblia infection.

Worm infection prophylaxes: Prophylactic tablets were left on the schools and will be given to the children them by Tapolina in 4 months. On the spot health education was aimed at increasing awareness of worm transmission, the different problems caused by intestinal helmets and the importance of deworming at least every six months.

Worm infection prevention. Ways of improving personal hygiene and sanitation through hand washing, nail trimming, wearing of shoes/boots and use of a latrine and clean water supplies were encouraged, with bearing the deplorable housing conditions of many families and the environmental hazards in mind. Although all members of a population can be infected by intestinal parasites, those who are at most risk and would benefit most from preventive interventions such as the deworming campaign are the pre-school and school children.

Gastrointestinal problems

In total 7% gastrointestinal problems were seen. Worm infections excluded. Only 2 children had symptoms of dysentery, with visible blood and mucus in their watery stool. They were treated with co-trimoxazole. 31 (3%) children were treated for Giardia lamblia infection because of abdominal pain, chronic diarrhea and sometimes bloody stools. We interpreted that the gastro-intestinal problems are also cause by giardia lamblia infections which is should be treated with antibiotic instead of anti-worm treatment due to results of faces test in 2015. In 2015 MCC was alert on the fact that West Bengal is an endemic area for bacillary dysentery with Shigella multi resistant to a lot of antibiotics. Nalidixic acid in stock should be considered. However due to the low prevalence on dysentery this was not done.

Many children 35 (4%) had complaints of constipation. This is significant less in comparison to 2015 were 148 (14%) showed complaints of constipation. The constipation is most probable due to the high intake of white rice (very little fibres) and the relative low consumption of fruit. Strong attention should be paid to the amount of water (at least 1 litre a day) and the amount of fibre. Another factor could be the lack of fat in the children's diet. Advice to give an additional spoonful of coconut oil or ghee (clarified butter) a day was therefore given to the caretakers.

Respiratory problems

A very low percentage only 2 of the 968 children were seen with an acute bacterial respiratory infection (ARI) and treated with appropriate antimicrobials and home treatment advice. None of these children only one was suspect for chronic lung disease and thereby tuberculosis.

A total of 21 children (2%) showed symptoms of viral bronchitis, 10 children had also complains of several chronical wheezing and asthma. A depressed immune function due to malnutrition is expected to increase the incidence of several infectious diseases. These two children were treated with doses inhaler Ventolin. Four out of 10 ten children showed severe complains and were treated with combined therapy Ventolin and formodide inhaler. Two children received a inhaler-chamber.

Cardiac problems
The MCC carousel also includes a cardiac examination. In 2014 we referred one boy with a pathological murmur with suspected diagnosis ventricular septum defect to YMWS for investigating possible cardiac operation at the Kolkata heart centre. Parents refused the referral. In 2015 one boy with severe growth retardation and a hartmurmer were seen. Also there we explained the possible complications of cardiac disease to the parents. Bearing in mind local problems with financial aspect, follow up care and complex cardio surgery, general advice for cardiologic evaluation was given, so local advice can be given.

In 2016 we saw 17 children with a clear hart murmer, 4 showed a pathological murmer and signs of malnutrition and were send for diagnostics. Results of outcome will be shared with oparents by YWS.

Skin diseases
A total of the 107 children (11%) had skin diseases. We saw 16 children with infected wounds, 5 children with fresh wounds, 13 children with impetigo, 23 children with dermatomycosis, 16 children had eczema, and the others had dermatitis or general skin reactions due to spoiled water and insect bites. Some children were seen with hypopigmentation, diagnosing either fungal disease or multi vitamin deficiency.

Antifungal cream (sometimes in combination with hydrocortisone) was given for fungal infections (dermatomycosis) and hydrocortisone cream was given for different forms of dermatitis. Infected wounds were treated with Fucidin cream, sometimes in combination with oral antibiotics.

14 children had scabies and were either treated with Permetrin lotion. Additional information on treatment of the clothes and the bed linen was given to the caregivers. Ivermectin tablets were not supplied because of no good dose available for children.

Ear/nose/throat (ENT) problems
8 children had an acute middle ear infection, 17 children had middle ear infection with effusion, 57 external otitis, 1 had a tympanic perforation, 3 children had complaints of adenotonsillitis, 3 children had clinical hearing impairment and were also referred to an ENT specialist.

Eye problems
Some school children complained about dry and/or painful eyes. Xerophtalmia can be attributed to Vitamin A deficiency. The national Vitamin A program in India reaches about 85 to 90% of the children 6 to 59 months old twice yearly through a community strategy. (Kapil et al, Indian J Med Research 2013) Vitamin A deficiency affects 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 or intestinal absorption, or transport and metabolism are impaired as a result of conditions such as diarrhoea. The most important step in preventing Vitamin A deficiency is ensuring that children's diets include adequate amounts of carotene containing cereals, tubers, vegetables and fruits. We treated children with painful eyes with extra vitamin supplements.

3 children had vision problems and were happy to receive a pair of glasses on the spot, with which they told us about their improved vision. Vision was checked with o official vision card used which was provided by the Onze Lieve Vrouwe Gasthuis, Amsterdam The Netherlands.

(Clinical) Vitamin deficit

Of the checked children, 99 (10%) had clinically signs of vitamin deficit. This were 7% of the children in respectively Bhagawatipur and Joynagar,15% of the children Raghunathpur and 9% of the children in the Sundarbans.

The vitamin deficiency is mainly due to malnutrition and parasitosis. When children have adequate sources of nutrients, they are better able to survive infections and develop their full potential. Many of these children had complaints of pain in their knees and legs maybe due to Vitamin D deficiency. They were given multivitamins for 2 months and dietary advice (more egg, dairy and vegetables).

Evaluation of Dental care

In general a very high caries prevalence was found: 261 (27 %) of the children had dental problems including; 7% (n=19)pain, 12% (n=31) caries with pain and 42,5% (n=111) pain with caries no other specified. In total 14% of the children with dental problems showed low weight for age and/or weight for height. In total out of 261, 32 (12%) children are in need of additional dental care. As far as the children with more deplorable dental care are concerned, there is a high correlation with the intake of sweets and sugary beverages.

No major differences between the schools were seen: children with dental problems (pain and/off caries) Bagwathipur 17,5%, Joynagar 18%, Ragnatiphur 15%, sunderbuns 17,5%.

Furthermore we provided toothbrushes to the school as well to incorporate daily tooth brushing at school as well. On the check days, many volunteers helped with the health promotion activities teaching proper hand and dental hygiene to all children checked and giving out colourful toothbrushes as well as toothpaste to the children.

Summery special cases and followup.

In total we have 29 Special cases. 7 children from Joynagar, 4 Ragnatiphur, 17 Sundarbans (7 due to low Hb probaly B thallasemia) and 1 Bagwathipur. In the Sunderbans 7 children with severe anaemia were seen. Probably all due to B thallasemia (major). Two of the children were diagnosted with B Thallasemia major. And a nurse/ helath worker from the sunnaban district confirmed the high prevelation of B thallasemia on the sunnabuns. 20 children are in need for followup of different reasons. All mcc numbers are lised in attachement 4.

V. A 3 Year comparison

After 3 year collaboration of MCC and YMWS in the South Parganas it is important to evaluate the effect of the collaboration. Overall a third of the children checked were seen last year as well, Table 15. Differences were seen between the different locations. It should be noted that the selection of children may differ some years, meaning that it is not 100% the same population we see every year. This may explain why in 2015 there was a slight increase in some determinants visible in the table below. Taken over the three years as a whole, still a decrease in notable.

When malnutrition and anaemia are evaluated over the three years a decline is seen, Figure 15 a and b. The three schools by start of the collaboration in 2014 were Raghunathpur, Joynagar and Bagwathipur. Raghunathpur was the school with the highest levels of underweight. However anaemia and stunting were highest in Joynagar in 2014. All schools show recovery. Secondly changes were made with introduction of a breakfast program in 2015 in Bhagawatipur and Raghunathpur later on in the year. After three years of medial check and start of a breakfast program in Raghunathpur a decline of anaemia was visible in 2016.

Table 15: Children checked last year

	Total		Bhaga		Joy		RGH		Sun	
	968		Total= 143		Total= 185		Total= 365		Total= 275	
	N	%	n	%	n	%	n	%	n	%
No	615	64%	85	59%	117	63%	139	38%	274	100%
Yes	353	36%	58	41%	68	37%	226	62%	1	0%

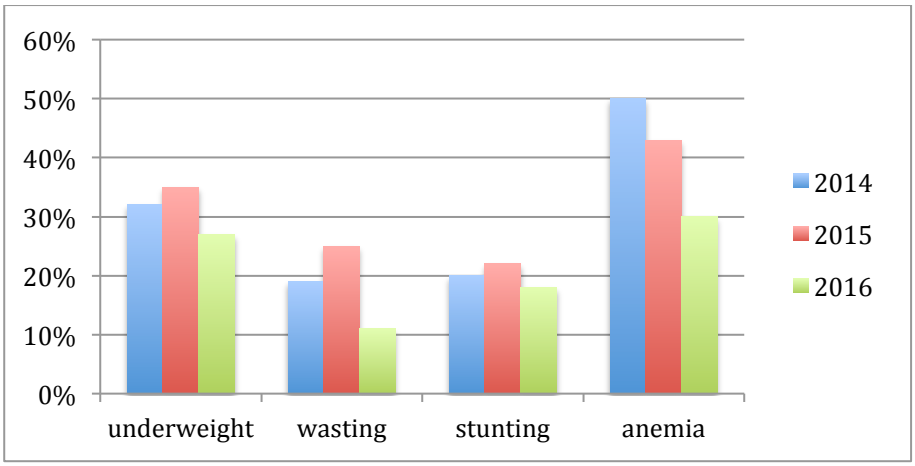


Figure 5a A 3 years comparison overall

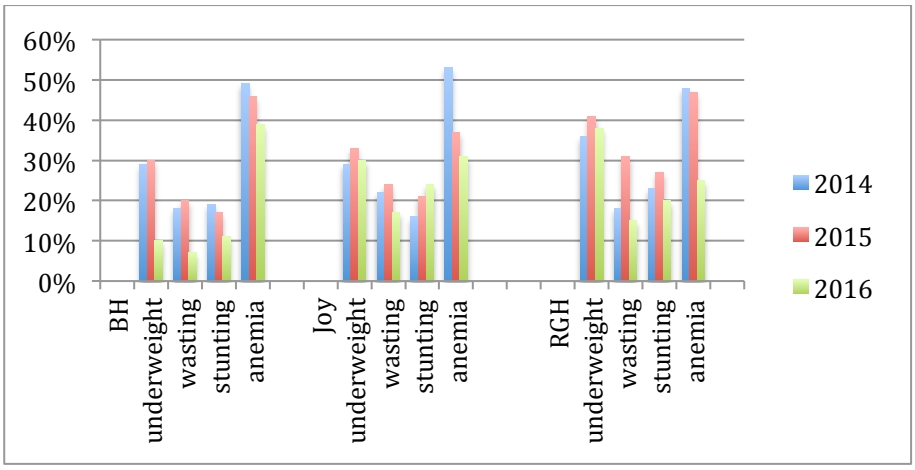


Figure 5b A 3 year comparison for the specific schools.

The health status of the children included in the medical camps of MCC is expected to improve further over a longer period of time, due to sustainable knowledge transfer during the camps. This knowledge transfer about health and healthy behaviour to children, local teachers and caregivers will over time increase health literacy, health awareness and the understanding of the importance of health in the community. In the long run, therefore, all these aspects will have a continued effect on the general health of the community

VI Education of teachers, caregivers and local helpers

One of the most important tasks of MCC is to encourage the continuation of health education of the teachers, parents and other caregivers of the village children. Nutritious foods, deworming, iron and vitamin supplements, as well as hygiene, should be key components of structural health promotion in local schools. We especially focused on anaemia and malnutrition, balanced diet, infections, parasites and worm infestations. Based on WHO estimates, 25% of the global burden of disease is due to preventable environmental exposures, with the greatest burden to children in low-income and developing countries. For this reason, it was MCC's task to help create sustainable health knowledge in the communities visited.

During the week the mixed Dutch/English/Bengali speaking team shared knowledge about common diagnoses of frequent illnesses and treatments. This was done through repeated health messages, which were conveyed in two ways: in various stations of the carrousel and through actual educational sessions and workshops. At the blood station (station 4), in the discussions with caregivers during physical check-up of the children by the clinical doctor (station 5), at the pharmacy (station 6) and the hygiene and dental health station (station 7), children and caregivers received tips and knowledge on health. Repetition of the health messages helped to reinforces knowledge.

New these years were the interactive session with parents and caregivers. The rationale behind this is that health and healthy practices in children should not only be promoted in schools, but for a large part are determined by the dedication to it in the home environment, with the guidance of parents. Active involvement of parents was therefore promoted by these interactive sessions. During waiting time for registration two members of the team; Renée van Hoof (MCC) and Priya Parui (teacher at YMWS location Bhagawatipur) informed the parents about good health including hand washing, good dental care and worm infections. There was the opportunity of asking questions, which led to interactive discussions between the two members of the team and the parents, and mutual learning.

Moreover, during the second afternoon of the camp this year, an interactive health workshop was conducted with local teachers and volunteers. Within these workshops materials were used and provided to the teachers, that they can use as tools in their own classes to educate their students on health related issues. The workshops were based on self-experience, and included deeper information on hygiene, tooth bushing and common health issues in children. See Attachement 5.

The health status of the children included in the medical camps of MCC is expected to improve further over a longer period of time, due to sustainable knowledge transfer during the camps. This knowledge transfer about health and healthy behaviour to children, local teachers and caregivers will over time increase health literacy, health awareness and the understanding of the importance of health in the community. In the long run, therefore, all these aspects will have a continued effect on the general health of the community population.

At the pharmacy station, children who did not need any medication received a certificate of health, provided by MCC. This was chosen to encourage the belief that not receiving anything is good. No need for medication is something worth to be rewarded, and the certificate was meant as a proof of good health.

VII Orphanage visit

During the mission MCC was invited by our local dentist to visit an orphanage which was located near the school in BH. During the visit a clean orphanage was seen where children from 0-18 were located. In total 90 girls and 70 boys find their home in this orphanage. A total of 60 staff members work in the orphanage. The orphanages has a good network and good availabilities for medical care. During the visit of mcc 3 sick children on the baby room were seen. The day after the visit two of these kids were brought to MCC medical camp and checked. By checking these two children all medical condition were seen by doctor in the weeks before visits mcc. As well medication was supplied. The third child was to sick to come to the medical camp. We advised to bring this child to the hospital. Moreover, recommendation regarding baby nutrition was given. After the medical camp a small group of mcc members went back to the orphanage were multivitamins for the 10 children aged < 1 year and anti-scabies treatment was supplied.

Recommendation: The orphanage is a very good organised and children do have a good health condition. Mostly due to the well-equipped staff of teachers, social workers and nurses. They also have good entrance to medical care. Therefore MCC does not see the need for more medical support to this organisation.

VIII General conclusion and future medical needs

The MCC Kolkata mission 2016 was the third mission in this region. Mr Shourabh Mukerjee considers this population as a population with a low awareness of health. The MCC mission formed the third medical intervention on this scale, implementing anti-worm programs, iron supplementation and multivitamin programs. The results above show the effect of alll the work in the last three years. However a continuous need is there for preventive medical help for the children in South 24 Parganas district in absence of a national school health program. Investing in capacity building and knowledge transfer about the circle of malnutrition, parasitosis and anaemia is essential and could be the first step to change the medical quality of life of thousands of village children and consequence improved learning at school.

This can be continued by organizing community workshops and making sure that the national vaccination, vitamin A and deworming program has a 100 % outreach. Furthermore, the schoolteachers should be involved in education on health of the children and their families. One of the basic principles: (Shourabh): Promoting passion and passion leads to involvement

IX Specific appointment and recommendations

In this section we would like to point out the recommendations for further collaboration between MCC and YWS in next and coming year(s). Hereby we would like to made two differentiation; criteria for future collaboration which should be full filled by MCC and YWS in February 2017 for further collaboration and new medical camps, secondly strong recommendations and suggestions will be made.

The goal of the collaboration between MCC and YWS is to implement awareness of good health on the YWS schools. MCC is the first step in this independent program for the YWS. From start in 2014 this project was a full 100% collaboration. In 5 year YWS should be self-supportive and equipped. Figure 17.

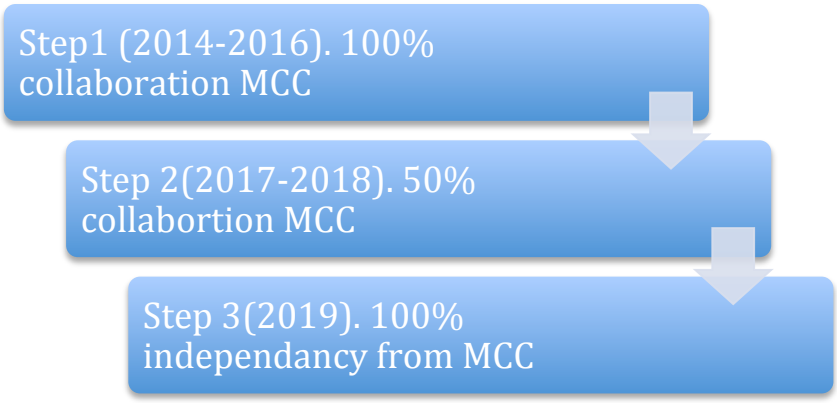


Figure 17. Future collaboration time line.

Criteria and recommendations:

Criteria for 2017 YMWS:

- Start of health worker for follow-up programs on at least 2 schools.
  MCC advises to have a nurse/ or a teacher who can work as a health worker on the YWS school. This health worker would have two mean tasks:
  1. Take care of public health on YMWS (including implementation of hand wash and teeth brushing on schools, provide work-shops for teachers and of parents)
  2. Identify the children who need special attention.
  3. Report twice yearly a feedback to the YMWS coordinator (Tapolina and MCC).
  4. Feedback on referrals during mission 2016
  5. List selected children from health worker in October en January for children with extra needs and growth follow-up.
  We recommend a teacher working on one of the schools (such as Priya Parui which will be capable to fulfil this role when extra schooling is provided.

- Teeth brushing and hand washing should be implemented in the school daily practise for children on the YMWS school in at least 2 schools.
- Anti-worm provided should be provided every 6 months on RAG, BH, and Joynagar.

Criteria for 2017 MCC

- MCC will provide guidelines for tasks of the health worker (inclusive guidelines on how to follow-up the children and to identify the children with special needs, growth charts and material for workshops), see Attachment 1-3, 5
- MCC provides materials and work format for a dental camp, and finances instruments
- Anti-worm medication is provided for treatment during the year
- MCC does not support alternative medicine

Strong recommendations

YMWS:

- Continuing the food program implemented as integrated part of class at at least the locations JOY and BH
- Dental care, MCC advises one dental camp at every school during the school year.
  - One teacher of each school could be trained to identify children with dental need. Training could be given by the health worker supported by MCC. See Attachment 3. The identified children should then be checked by a dentist.
  - Dentist Dr. Appratim is a good dentist and MCC suggest collaboration with his practice.
  - Dental equipment sponsored by MCC should be owned by YMWS and stored organized

MCC:

- MCC aims to arrive two days ahead of check week to 1) discuss last year's progress 2) the aims for the check week 3) to discuss the children who are selected on the list provided by the health worker.
  Secondly a workshop with the teachers (also SUN teachers invited) could be conducted before the start of the check week.

General optional and future ideas

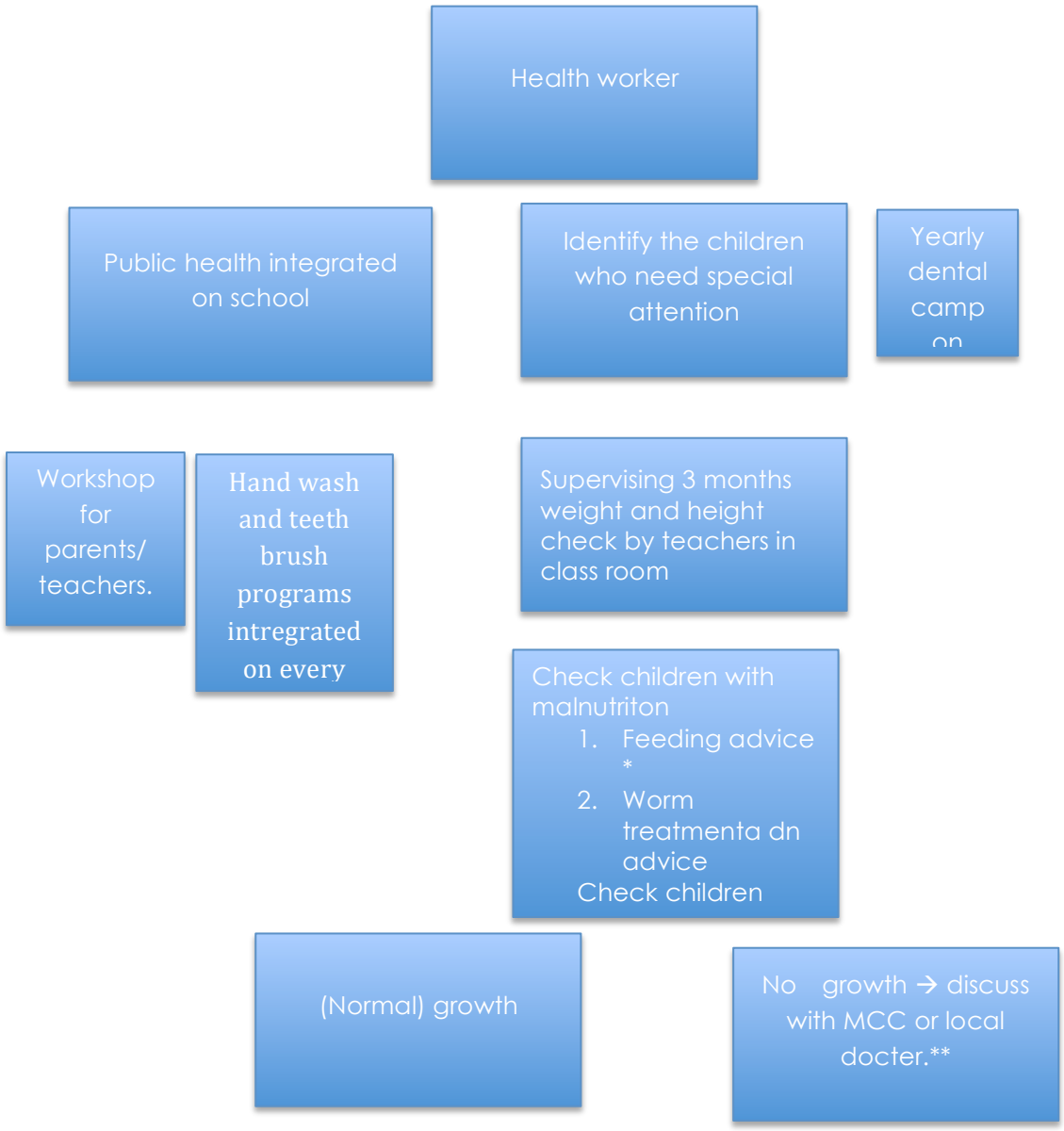
1. 2017 only medical checks of health worker selected children in JOY, BH
2. 2017 General medical check in RGN because trust with parents is not as in the other schools
3. 2017 New school with children in need; slums Kolkata?
4. 2017 Sunderbans optional ?

X Attachements

Attachment 1 Guideline health worker

The health worker should be a person with nurse degree or either public health degree. This health worker would have two mean tasks:

1. Take care of public health on YWS (including implementation of hand wash and teeth brushing on schools, provide work-shops for teachers and of parents)
2. Identify the children who need special attention. And give twice yearly a feedback to the YWS coordinator (Tapolina and MCC).
3. Feedback on referrals during mission 2016
4. List selected children from health worker in October en January for children with extra needs and growth follow-up.



* Three question should be asked:

1. What is the feeding habit of the child

2. How is the dental care

3. Are there signs of a active worm infection.

** *Local doctor is advised for collaboration with health worker. Twice yearly the helath worker can discuss the special case with the doctor.*

Attachment 2 Growth Curves and Instructions
(To discuss with health care worker)

Attachment 3

Dental Instruction. See powerpoint presentation, "Where there is no dentist"

Attachment 4 Overview special cases and children for revisit

1. Special case
2. Revisit because of malnutrition

MCC number	specialty	Revisist	Revisit reason	school
520	Lab results	yes	Results lab	Joy
809	cardiology	yes	Results cardiology	Sun
753	B thallasemia major	yes	Followup nutrition status	Sun
726	Severe low Hb	yes	Followup nutrition status	Sun
612	Oculaire myastenia send to neurologist	-	-	Sun
744	Oculaire myastenia send to neurologist	-	-	Sun
583	Cardiology irregulair hartritme	yes	results	Joy
497	Amelogenesis imperfecta	-	-	Joy
522	Utra sounds kidneys	yes	Results/ Followup needed?	Joy
417	Nail extraction	yes	Check healing proces	Joy
505	cardiology	yes	results	Joy
439	Abducense paresis send to neurologist	-	-	Joy
178	cardiology	yes	results	Ragn
211	Tyroid function check (lab results normal	-	-	Ragn
179	ENT specialist	-	-	Ragn
851	TBC?	yes	Followup nutrition status PM send to hospital for TB check	Bagw
652	Phimosis	-	urologist	Sun
631	Infected woudn leg	yes	Check healing proces	Sun

544	Infected skin	yes	Check healing proces	Sun
674	Severe anemia	yes	Check nutrition status	Sun
670	Hernia inguinalis	yes	Send to urologist	Sun
640	Severe anamia B Thalassemia Major	yes	Followup nutrition status	Sun
632	Wound infection	yes	Check healing proces	Sun
685	Strange story with different wound on young child	YES/ IMPORTAND	Evaluation home situation. IMPORTAND	Sun
691	Severe anaemia	yes	Check nutrition status	Sun
633	Severe anaemia	yes	Check nutrition status	Sun
643	Severe anaemia	yes	Check nutrition status	Sun

Revisit because of malnutrition

MCC number and school (village). Number in red are children with severe malnutrition and are in extra need of a revisit.

85	RGH	395	Joy	586	Joy
87	RGH	398	Joy	498	Joy
107	RGH	407	Joy	587	Joy
120	RGH	414	Joy	450	Joy
179	RGH	415	Joy	752	Sun
208	RGH	440	Joy	767	Sun
212	RGH	449	Joy	773	Sun
270	RGH	452	Joy	797	Sun
294	RGH	464	Joy	845	Sun
295	RGH	496	Joy	865	Sun
325	RGH	497	Joy	768	Sun
347	RGH	503	Joy	936	BH
353	RGH	527	Joy	982	BH
383	Joy	564	Joy	984	BH

Attachment 5: Workshops

Workshop India, Kolkata 2016, MCC.

Objective: To increase knowledge / attitude / skills, regarding:

- Dental care
- Worms / hygiene (= hands washing, soap, cooking water)
- Healthy food
-

- (If possible: implement food program followed by tooth brushing at school)
- Every step designed according to the learning-through-experience principle, and offering possibilities to carry out similar knowledge / attitude / skills-increasing activities in the classrooms with children

MATERIALS:

- Large paper (plenty)
- Pens (plenty)
- All three hand-outs per participant
- Mirrors
- Germ powder; UV-light; dark room.
- Tooth brushes (plenty) and plaque-identifier pills
- Sticky notes

PLANNING:

Take ample time beforehand to gather all participants (teachers, volunteers and other YMWS staff). Divide all participants into groups of approximately 5-6 persons, with two facilitators (MCC).

Timewise: Point out one facilitator that will keep track of time in general, of all the groups.

EXERCISES:

1) Germ powder (5 min)

- Apply powder to the hands of the participants, under the pretext of "this is disinfectant, good start of the workshop". Inform them to not wash their hands; don't give any more explanation at this point. It will be transparent.

2) Question round (5-10 min)

- Ask participants a number of questions to start with, to provide us with information, the knowledge of the local people (make notes of what is being said):
  a. What are you definitions of a health problem?
  b. What are the health problems in the area among children?
  c. What are your health needs? How do you currently deal with such problems? Does it work?

3) Teeth (15 min)

- Give a short (interactive) explanation of teeth, and the importance of brushing.
- Discuss with participants: How to brush (use the plasticised images). Brush 2x a day (after breakfast, before going to bed).
- Provide participants with plaque indicator pills (pink) and instruct them to suck on the pill until perished in the mouth. Meanwhile explain the purpose of this exercise: the abstract relation between the pink colour (= tooth plaque = dirt on the teeth = not brushing well), make sure this link is clear.

- After 2 minutes of tooth brushing, hand out spatula and mirrors for participants to check each other's mouth.
- Check the animo for brushing programmes at school. Animo toetsen voor tandenpoetsen op school.

***Knowledge transfer: how to brush, 2x a day (after breakfast, before bed).*

4) Healthy food (20 min)

- Mark on a wall / blackboard / large paper a 'good' side and a 'bad' side.
- Hand out a stack of sticky notes to everybody. Instruct to draw two healthy and two unhealthy pieces of food each. (Keep track of the time a participants may get very creative and draw precisely)
- Ask participants to stick the sticky notes on the correct side.
- Point out two participants to step forward, who pick their favourite food, and let them explain why this is healthy or unhealthy food.

**Knowledge transfer: Food is rich of nutrients. Children need such nutrients to grow, for energy, strong resistance (being healthy). Some things (sugar and soda's) are bad for the teeth, fried food (obesity

5 or 6) Worms (20 min) (half the groups start with exercise UV-light)

- Hand out and use the plasticised illustrations (worm cycle) during this exercise.
- Ask participants: Why are worms a problem? What do worm do in the body? How does the contamination with worms happen? (Sicken the child; 'eat' the energy and important nutrients of the child etcetera. Child will grow poorly, weak, not feeling well, tired at school, low school performance etcetera. Children with active worms can infect other children as well).
- Start explaining the vicious cycle; next discuss how to break the cycle.

***Knowledge transfer: What do worms do? How do children get infected? At least 1x per half year de-worming. How to prevent: hand washing (soap) and clean water (boil).*

6 or 5) Germ powder with UV-light (5 min)

- Start by asking participants: are your hands clean at the moment? Where have your hands been the past hour?
- Make sure to have put some powder on your own hands and face without them noticing.
- Take them to a dark room, hand out mirrors. Then switch on the light.
- Point out to each participant where the powder has gotten to (clothes, face, mouth, and etcetera).
- While in this dark room, explain: This represents how germs spread (bacteria, worm eggs). The idea is that even though your hands may seem, they are not.

***Knowledge transfer: Where do gems go, unnoticed? How easy do they spread? Refer to germs as pathogens. Where do they come from?*

7) Silhouette (20 min)

- Provide large papers. Instruct participants, in groups of 2, to draw their own silhouette.
- Let them draw some important things on their silhouette to stay healthy, which they have learned this week (or previous years).
- Hand out plasticised illustrations (big child / small child), and compare with the drawings. Discuss the drawings in the group. In particular, explain the link to the effect on the child.

*** Knowledge transfer: create an overview of all important factors. And growth and weight (curves) as determinants of health and development.*

8) Final team quiz (10-15 min; if time allows)

- Make sure all groups have finished the previous steps.
- A competitive (though encouraging) environment facilitates motivation, and reinforces the learning process. Therefore, ask your group to come up with a team name.

- Provide all the groups with a large paper.
- One facilitator asks, to all groups together, a number of questions. They get one minute to write down the answers. In the end, check who has the most correct answers, and give mayor applause to this winning team.

Quiz questions:

1. At which moments you, at least, should wash your hands with soap?
2. Name three healthy and three unhealthy foods children eat.
3. Noem drie gezonde en drie ongezonde voedingsmiddelen
4. A. What times in the day you should brush your teeth
   B. Why should you brush your teeth?
5. Why is it not wise to defecate close by where you or other children wash / play / drink?
6. What does soap do? Why is it important to use soap?
7. What is the effect of worms on a child? Name as many as you can think of.
8. Which two determinants can be measured of a child, that could indicate that a child is not healthy or developing well?