Medical Checks for Children

# Medical Rapport Kolkatta 2015

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**MCC Kolkata 2015**

Medical Report Kolkata 2014 Medical Checks For Children

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## I Introduction

From the 27th of April until the 2nd of May 2015, a Medical Checks for Children team (MCC) team visited for the second time Bhagabatipur, Mandirbazar, near Kolkata in India. We checked and treated 1052 children on the spot aged between 0 and 12 free of cost at three different locations. The main group of children was between 3 and 9 years of age.

The team stayed in the Purnalakshmi Hotel in Diamond Harbour, a suburb of Kolkata, on the banks of 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 get there.

The children we checked are attending pre-primary (nursery) and primary schools in the underprivileged rural areas in West Bengal, District South 24 Parganas, and have limited access to medical facilities. Especially in West Bengal there is a parallel health care market. Rural Medical Practitioners (RMP) often practice modern allopathic medicine without any formal training ('quacks'). Compared to the government facilities and private doctors there is a prominent dominance of the RMP in rural outpatient care. 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."

This year's free medical campaign of MCC location Bhagabatipur was the second 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.

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 Mr 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 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 2015 consisted of Ilse Westerbeek (paediatrician and organizational/medical mission leader), Roelof van Ewijk (paediatric resident and organizational/medical mission leader), Renée van Hoof (Master student International Public Health), Arefa Temar (Master student International Public Health), Claasje van der Zwet (general practitioner), Gé-Ann Kuiper (paediatric resident), Nicole van Buuren (general practitioner), Caroline de Wit (Ear-Nose-Throat resident), Mina

Amaray (Medical intern), Doutsen Hoekstra (assistant strategic 's and business development), Cindy Braaksma (teacher primary school / teacher 's internal mentor), Michael Roesler (master in sports, owner day-care for children)

Technical equipment, toothbrushes, toothpaste 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 Shazia from YWSPG from Dipti pharmacy, a local generic drug company, with Mr Chandan as our contact person. Furthermore extra medication was bought locally at Diamond Harbour from Singh, Bina and Niramoy pharmacy. Especially 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 children, each accompanied by a caregiver.
- Information transmittance to the local communities.
- Organizing all the different stations of the carousel
- Arranging many and very good translators
- Facilitating board and arranged a good hotel for all MCC team members.
- Transportation of the MCC team to the check location.
- Providing the food on the check locations
- Prior announcement of the medical campaign on the location.
- Giving support in ordering and delivering the medication.
- Giving support to the MCC team during the medical campaign.

In Bhagabatipur our group 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 12 Dutch team members accompanied by a daily changing number of Indian volunteers/translators and drivers. In total the multidisciplinary group 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

Table1: Number of checked children per day and geographical location

| | 27-04-15 | 28-04-15 | 29-04-15 | 01-05-15 | 02-05-15 | Total |
|---|---|---|---|---|---|---|
| BH | 174 | 173 | 0 | 0 | 0 | 347 |
| Joy | 0 | 0 | 0 | 183 | 151 | 334 |
| RGH | 0 | 0 | 371 | 0 | 0 | 371 |
| **Total** | **174** | **173** | **371** | **183** | **151** | **1052** |

BH: Bhagabatipur, Joy: Joynagar, RGH: Raghunathpur

The children were seen free of cost at the MCC carousel, which consists of the following stations:
1. Registration
2. Height and weight (saturation occasionally)
3. Blood test (haemoglobin)
4. Physical examination
5. Distribution of medication (pharmacy)
6. Education on hygiene, tooth brushing (a tooth brush was given to each child) and hand washing.
7. On indication extra stool sample or blood test

Data collection

Anthropometric measurements were recorded, and a finger prick sample was taken to determine the haemoglobin (Hb) concentration. Each child was examined by a clinical officer. 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.

Furthermore stool samples were taken of children with gastro-intestinal symptoms to evaluate parasitic infections and children with severe growth retardation and or severe anaemia were taken extra blood samples to provide more information about type of anaemia or other underlying causes.

At the end of the MCC carousel, the data of the checked children were analysed, which made it possible to make a quick scan of children's health every evening, which was communicated to the team. Furthermore every day there was a short evaluation of the day to improve logistics next day.

**III General diagnoses and categories of ailments/treatment and referrals**

During the week, MCC checked 1052 children at three different locations within District South 24 Parganas, West Bengal.

The three 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 location of Bhagabatipur has even a kitchen garden with delivery of one brunch a day for the schoolchildren.

Though in general the primary focus of MCC is on 0 to 5 year olds, the focus here was on checking vulnerable nursery and school children up to 9 years old. Of all checked children, 31 % of the children were under 5 years old, with 69 % children 5 to 12 years old.

**Table 2: Summary of checked children per geographical location, age and gender**

| | Total | | BH | | Joy | | RGH | |
|---|---|---|---|---|---|---|---|---|
| | 1052 | | Total= 347 | | Total= 334 | | Total= 371 | |
| **Age** | **N** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| <=1 year | 3 | 0% | 2 | 1% | 0 | 0% | 1 | 0% |
| >1 en <5 years | 323 | 31% | 109 | 31% | 99 | 30% | 115 | 31% |
| <5 years | 326 | 31% | 111 | 32% | 99 | 30% | 116 | 31% |
| >=5 en <=10 years | 719 | 68% | 232 | 67% | 233 | 70% | 254 | 68% |
| >10 years | 7 | 1% | 4 | 1% | 2 | 1% | 1 | 0% |
| **Gender** | | | | | | | | |
| Boy | 551 | 52% | 203 | 59% | 160 | 48% | 188 | 51% |
| Girl | 501 | 48% | 144 | 41% | 174 | 52% | 183 | 49% |

The overall child health status of the children was slightly poor, with a high percentage of 34 % underweight, 20% wasting and 22% stunting, 43 % anaemia and 50% caries.

**Table 3: Disease prevalence among all children per geographical location**

| | Total | | BH | | Joy | | RGH | |
|---|---|---|---|---|---|---|---|---|
| | 1052 | | Total= 347 | | Total= 334 | | Total= 371 | |
| | **N** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Underweight | 361 | 34% | 101 | 29% | 108 | 32% | 152 | 41% |
| Stunting | 228 | 22% | 58 | 17% | 70 | 21% | 100 | 27% |
| Wasting | 215 | 20% | 61 | 18% | 60 | 18% | 94 | 25% |
| Anaemia | 456 | 43% | 159 | 46% | 123 | 37% | 174 | 47% |

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 investigations.

**Table 4: Treatment among all children per geographical location**

| | Total | | BH | | Joy | | RGH | |
|---|---|---|---|---|---|---|---|---|
| | 1052 | | Total= 347 | | Total= 334 | | Total= 371 | |
| | N | % | n | % | n | % | n | % |
| iron therapy | 30 | 3% | 14 | 4% | 11 | 3% | 5 | 1% |
| multivitamins | 648 | 62% | 207 | 60% | 200 | 60% | 241 | 65% |
| anti-worm (prophylactic) | 307 | 29% | 103 | 30% | 87 | 26% | 117 | 32% |
| acute worm | 722 | 69% | 242 | 70% | 236 | 71% | 244 | 66% |
| anti-scabies | 45 | 4% | 7 | 2% | 21 | 6% | 17 | 5% |
| amoxicillin | 21 | 2% | 6 | 2% | 4 | 1% | 11 | 3% |
| Clarithromycin | 7 | 1% | 3 | 1% | 2 | 1% | 2 | 1% |
| metronidazole | 7 | 1% | 2 | 1% | 5 | 1% | 0 | 0% |
| co-trimoxazole | 14 | 1% | 5 | 1% | 2 | 1% | 6 | 2% |
| ceftriaxone | 1 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| eardrops | 11 | 1% | 2 | 1% | 5 | 1% | 4 | 1% |
| hydrocortisone cream | 32 | 3% | 11 | 3% | 6 | 2% | 15 | 4% |
| dactarin cream | 29 | 3% | 14 | 4% | 8 | 2% | 7 | 2% |
| fucidin cream | 33 | 3% | 12 | 3% | 11 | 3% | 10 | 3% |
| eye drops | 4 | 0% | 0 | 0% | 3 | 1% | 1 | 0% |

One of the checked children needed to be admitted to hospital during our work because of arthritis/osteomyelitis. However, as father was not there and his permission for admission was needed, we treated the child on the spot with IV antibiotics and a prescription of high dose oral antibiotics to continue. Follow up was locally arranged and at the moment of this writing, the child was doing fine and could walk well.

15 children were referred to the outpatient department of the local hospital (in Diamond Harbour) for further diagnostics, cases will be rechecked after some weeks by Mr Chandra himself, and 78 children had other additional advice.

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

| | Total | | BH | | Joy | | RGH | |
|---|---|---|---|---|---|---|---|---|
| | 1052 | | Total= 347 | | Total= 334 | | Total= 371 | |
| | N | % | n | % | n | % | n | % |
| Dentist | 231 | 22% | 74 | 21% | 76 | 23% | 81 | 22% |
| Specialist in hospital | 15 | 1% | 4 | 1% | 6 | 2% | 5 | 1% |
| Revisit | 68 | 6% | 27 | 8% | 14 | 4% | 27 | 7% |
| X-thorax | 4 | 0% | 3 | 1% | 1 | 0% | 0 | 0% |
| ECG | 2 | 0% | 1 | 0% | 1 | 0% | 0 | 0% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Urine + Kidney function | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Blood test after 3 months | 10 | 1% | 5 | 1% | 2 | 1% | 3 | 1% |
| International organisation | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| Other… | 127 | 12% | 32 | 9% | 40 | 12% | 55 | 15% |

IV Specific diagnoses and categories of ailments/treatment and referrals

Growth abnormality and malnutrition (34 % underweight, 20% wasting and 22% stunting)

Malnutrition is thought to account for one third of all deaths of children under five (UN Millennium Developmental 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. More underweight children were seen in rural areas among Muslim families with illiterate parents and low living conditions. This 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: Prevalence of weight/age at or under P3 (underweight) per geographical location by age and gender**

| | **Total** | | **BH** | | **Joy** | | **RGH** | |
|---|---|---|---|---|---|---|---|---|
| | **1052** | | **Total= 347** | | **Total= 334** | | **Total= 371** | |
| | **N** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Underweight | 361 | 35% | 101 | 30% | 108 | 33% | 152 | 41% |
| No underweight | 678 | 65% | 239 | 70% | 221 | 67% | 218 | 59% |
| Unknown | 13 | 1% | 7 | 2% | 5 | 1% | 1 | 0% |
| **Underweight children per age** | | | | | | | | |
| <=1 year | 1 | 33% | 1 | 50% | 0 | 0% | 0 | 0% |
| >1 en <5 years | 101 | 31% | 26 | 24% | 30 | 30% | 45 | 39% |
| <5 years | 102 | 31% | 27 | 24% | 30 | 30% | 45 | 39% |
| >=5 en <=10 years | 258 | 36% | 74 | 32% | 78 | 34% | 106 | 42% |
| >10 years | 1 | 100% | 0 | 0% | 0 | 0% | 1 | 100% |
| **Underweight children per gender** | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Boy | 187 | 34% | 62 | 31% | 48 | 30% | 77 | 41% |
| Girl | 174 | 35% | 39 | 28% | 60 | 35% | 75 | 41% |

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

| | Total | | BH | | Joy | | RGH | |
|---|---|---|---|---|---|---|---|---|
| | 1052 | | Total= 347 | | Total= 334 | | Total= 371 | |
| | N | % | n | % | n | % | n | % |
| Stunting | 228 | 22% | 58 | 17% | 70 | 21% | 100 | 27% |
| No stunting | 821 | 78% | 288 | 83% | 263 | 79% | 270 | 73% |
| Unknown | 3 | 0% | 1 | 0% | 1 | 0% | 1 | 0% |
| **Stunting children per age** | | | | | | | | |
| <=1 year | 1 | 33% | 1 | 50% | 0 | 0% | 0 | 0% |
| >1 en <5 years | 94 | 29% | 26 | 24% | 23 | 23% | 45 | 39% |
| <5 years | 95 | 29% | 27 | 24% | 23 | 23% | 45 | 39% |
| >=5 en <=10 years | 131 | 18% | 30 | 13% | 46 | 20% | 55 | 22% |
| >10 years | 2 | 29% | 1 | 25% | 1 | 50% | 0 | 0% |
| **Stunting children per gender** | | | | | | | | |
| Boy | 121 | 22% | 36 | 18% | 35 | 22% | 50 | 27% |
| Girl | 107 | 21% | 22 | 15% | 35 | 20% | 50 | 27% |

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

| | Total | | BH | | Joy | | RGH | |
|---|---|---|---|---|---|---|---|---|
| | 1052 | | Total= 347 | | Total= 334 | | Total= 371 | |
| | N | % | n | % | n | % | n | % |
| Wasting | 215 | 25% | 61 | 20% | 60 | 24% | 94 | 31% |
| No wasting | 645 | 75% | 239 | 80% | 194 | 76% | 212 | 69% |
| Unknown | 192 | 18% | 47 | 14% | 80 | 24% | 65 | 18% |
| **Wasting children per age** | | | | | | | | |
| <=1 year | 1 | 33% | 1 | 50% | 0 | 0% | 0 | 0% |
| >1 en <5 years | 64 | 20% | 16 | 15% | 14 | 14% | 34 | 30% |
| <5 years | 65 | 20% | 17 | 15% | 14 | 14% | 34 | 30% |
| >=5 en <=10 years | 150 | 28% | 44 | 23% | 46 | 29% | 60 | 32% |
| >10 years | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| **Wasting children per gender** | | | | | | | | |
| Boy | 104 | 24% | 32 | 19% | 25 | 21% | 47 | 31% |
| Girl | 111 | 26% | 29 | 22% | 35 | 26% | 47 | 31% |

The checked children showed significant levels of malnutrition, with 43 % suffering from anaemia (see Table 8). Compared with last year this is a little less, where last year 50% of all children had anaemia. The findings of malnutrition were discussed last year with YMWS and they started a food program in January 2015 at the school in Bhagwatipur 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

This year we treated all children with growth abnormalities with multivitamins for 2 months, and spread the knowledge to the care takers about the necessity of fruit and green vegetables in their child's diets.

Furthermore we gave interactive workshops to all the schoolteachers (around 45) about food. Based on the information we received last year and what we heard this year this from the teachers

on the dietary habits of the villagers and their children we got an impression of their daily diet. The main intake is parboiled rice, vegetables and legumes in broth, twice a week yoghurt or milk, once a week an egg, 1 to 3 times a week fruit, and sometimes a snack such as biscuits or chocolate. No or few fish or chicken. Prices of the food on the market are….

Reflecting on the eating habits we conclude that the children consume small and thus insufficient amounts of dairy. As a large amount of Indians are lactose intolerant, fermented dairy products such as yoghurt are easier to digest and are a good alternative for young Indian children. The children also eat very small amounts of animal products and together with the low amount of dairy products have a high risk of lack of protein and vitamin D.

During the medical check-ups and workshops, we paid special attention to issues of hygiene, nutritional advice, tooth brushing

Anaemia (43 %)

It is estimated that 47% of preschool children are anaemic globally 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 Bhagabatipur checked was high (43 %). The anaemia is largely attributable to poor dietary quality (diets low in key nutrients) and disease/worm loads.

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.

**Table 9: Prevalence of anaemia per geographical location by age and gender**

| | **Total** | | **BH** | | **Joy** | | **RGH** | |
|---|---|---|---|---|---|---|---|---|
| | **1052** | | **Total= 347** | | **Total= 334** | | **Total= 371** | |
| | **N** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Anaemia | 456 | 43% | 159 | 46% | 123 | 37% | 174 | 47% |
| No anaemia | 595 | 57% | 187 | 54% | 211 | 63% | 197 | 53% |
| Unknown | 1 | 0% | 1 | 0% | 0 | 0% | 0 | 0% |
| Hb <5,0 mmol | 3 | 0% | 2 | 1% | 1 | 0% | 0 | 0% |
| **Anaemia per age** | | | | | | | | |
| <=1 year | 2 | 67% | 1 | 50% | 0 | #DEEL/0! | 1 | 100% |
| >1 en <5 years | 143 | 44% | 57 | 52% | 37 | 37% | 49 | 43% |
| <5 years | 145 | 44% | 58 | 52% | 37 | 37% | 50 | 43% |
| >=5 en <=10 years | 310 | 43% | 101 | 44% | 86 | 37% | 123 | 48% |
| >10 years | 1 | 14% | 0 | 0% | 0 | 0% | 1 | 100% |
| **Anaemia per gender** | | | | | | | | |
| Boy | 247 | 45% | 100 | 49% | 61 | 38% | 86 | 46% |
| Girl | 209 | 42% | 59 | 41% | 62 | 36% | 88 | 48% |

We treated the children with anaemia and no infection or growth abnormality with iron supplements for three months. Mild anaemia was mostly treated with multivitamins for 3 months, 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. 5 children showed a haemoglobin level below 5.0 mmol/l. Of the children with a low haemoglobin level we were able to do extra blood samples to determine underlying causes. Some of the children had a low serum ferritin concentration. As these result came in after the checks and if these children were not yet treated with Irons we advised to threat these children with Iron. 1 child had a B-thallasemia trait. We provided information about this medical condition.

***Table 7. Relative extent of iron stores on the basis of serum ferritin concentration***

| Iron stores | Serum ferritin (µg/l) | | | |
|---|---|---|---|---|
| | *Less than 5 years of age* | | *More than 5 years of age* | |
| | *Male* | *Female* | *Male* | *Female* |
| Depleted iron stores | < 12 | < 12 | <15 | <15 |
| Depleted iron stores in the presence of infection | < 30 | < 30 | - | - |
| Severe risk of iron overload | - | - | > 200 (adult male) | >150 (adult female) |

To combat anaemia, vitamin C intake is important because vitamin C facilitates the uptake of iron in the gut (just as milk and tea counteracts it). The most powerful dietary strategy to improve iron absorption is to add fresh fruit (citrus fruit, guava) or vegetables (tomatoes, green leaves) rich in vitamin C and animal foods to a meal.

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.

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.
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). Therapeutic supplementation is generally intensive, 1-3 mg /kg/day, but of limited duration and directed at correcting iron deficiency anaemia. However in a study by Calis et al. (N Engl J Med 2008(9):888-99). Severe anaemia in Africa was not only due to iron deficiency, but also due to vitamins shortness and worm infections. 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 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.

Worm treatment (% prophylactic, % therapeutic)

**Table 10: Prevalence preventive anti-worm treatment in the last half-year per geographical location by age and gender**

| | **Total** | | **BH** | | **Joy** | | **RGH** | |
|---|---|---|---|---|---|---|---|---|
| | **1052** | | **Total= 347** | | **Total= 334** | | **Total= 371** | |
| | **N** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Anti-worm | 302 | 29% | 106 | 31% | 103 | 31% | 93 | 25% |
| No anti-worm | 749 | 71% | 240 | 69% | 231 | 69% | 278 | 75% |
| **Anti-worm per age** | | | | | | | | |
| <=1 year | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% |
| >1 en <5 years | 109 | 34% | 43 | 39% | 33 | 33% | 33 | 29% |
| <5 years | 109 | 33% | 43 | 39% | 33 | 33% | 33 | 28% |
| >=5 en <=10 years | 192 | 27% | 63 | 27% | 70 | 30% | 59 | 23% |
| >10 years | 1 | 14% | 0 | 0% | 0 | 0% | 1 | 100% |

Of all the children we checked 29% had been given anti-worm prophylaxes within the last 6 months by the community health centre. Unfortunately the anti-worm tablet we left last year for prophylactic treatment 6 months after the checks in 2014 were not given.

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. 29% 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. To explore this in more detail stool samples were taken from 50 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.

A strong relationship exists between Ascaris Lumbricoides, or T. Trichura infection, and anaemia. We treated 722 children (69%) for active worm infection 3 days 2 tablets Mebendazol 100 mg.

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.

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.

**Respiratory problems**
A very low percentage (only 9 children) of the 1052 children were seen with an acute bacterial respiratory infection (ARI) and treated with appropriate antimicrobials and home treatment advice. Of these children in 3 children there was clinical suspicion on tuberculosis, where for X-ray investigation will be done. Possible explanation of this finding could be found in the high temperature during this hot summertime.
We saw only a few children with symptoms of viral bronchitis, wheezing and asthma. A depressed immune function due to malnutrition is expected to increase the incidence of several infectious diseases.

**Cardiac problems**
The MCC carousel also includes a cardiac examination. Last year 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. This year we saw this boy again with severe growth retardation, 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.

**Skin diseases ( 16%)**
161 (16%) of the children had skin diseases. We saw 8 children with infected wounds, 2 children with fresh wounds, 5 children with erysipelas, 24 children with impetigo, 33 children with dermatomycosis, 29 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.
42 children had scabies and were either treated with Ivermectin tablets or Permetrin lotion. Additional information on treatment of the clothes and the bed linen was given to the caregivers.

**Ear/nose/throat problems**
7 children had an acute middle ear infection, 10 children had middle ear infection with effusion, 7 external otitis, 6 had a tympanic perforation, 5 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. 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 Nerherlands.

(Clinical) Vitamin deficit 52 children (5%) (see also under 1: Growth abnormality and malnutrition)
Of the checked children, 52 (5%) had clinically signs of vitamin deficit. 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).

Gastrointestinal problems (15%) (worm infections excluded)
13 children had symptoms of dysentery, with visible blood and mucus in their watery stool. They were treated with cotrimoxazole. MCC might consider to stock nalidixic acid in the future, due to the fact that West Bengal is an endemic area for bacillary dysentery with shigella multi resistant to a lot of antibiotics. Two children had chronic diarrhoea and were treated with metronidazole. One child was treated with metronidazole due to suspected giardia infection.

Many children (148; 14%) had complaints of constipation, from moderate to severe with even two children diagnosed with rectal prolapse. 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. As additional medication bisocodyl (Colax) can be advised and will be ordered by MCC for the next mission in stock.
The 11 children with urinary tract infections sometimes also had severe constipation, a well-known risk factor for UWI. They were treated with cotrimoxazole for 7 days.

**Dental (50%)**
In general a very high caries prevalence was found: 50 % of the children had caries dental problems and 21 % severe caries with pain, often combined with secondary growth abnormalities. In total out of 231 (22 %) 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. 4 month ago there was dental camp on the school who gave extra information and advice to use more calcium containing product. They did not fill or extract teeth. Some of the children already had been to a local dentist who extracted teeth or filled the teeth. This MCC mission to Bhagabatipur did not include a dentist.

The referrals (231: 44% of the dental cases) of the MCC doctors to local dentists were limited to the most severe cases: profound caries with severe toothaches and in need of extraction. We stressed the importance of proper dental hygiene and the banning of sugary products, beverages and fast food to the children, their caregivers and their teachers. 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.

**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. 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. During the week the mixed Dutch/English/Bengali speaking team shared knowledge about common diagnoses of frequent illnesses and treatments. We especially focused on anaemia and malnutrition, balanced diet, infections, parasites and worm infestations. Nutritious foods, deworming, iron and vitamin supplements, as well as hygiene should be key components of structural health promotion in local schools.

**General conclusion and future medical needs**

**MCC Kolkata 2015**

The MCC Kolkata mission 2015 was the second medical mission in this region. Mr Shourabh Mukerjee considers this population as a population with a low awareness of health. The MCC mission formed the second medical intervention on this scale, implementing anti-worm programs, iron supplementation and multivitamin programs The results above show the continuous need 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

**Specific appointment and recommendations**

- Food program: Continue the already started food program in Baghwatipur and also implement this on the other schools.
- Dental care: YWHS is responsible for a good dental program and is looking into this. They try to provide a dental camp every 4 months
    - Dentist has to look to the whole process (brushing, advices, treatment)
    - A structural tooth brushing program should be implemented on the school. Therefore MCC provided toothbrushes for the children on the school.
    - YHWS will look if they also could provide toothpaste
    - Tapolina will talk with teachers about brushing on school and implement this daily at school
- Workshops
    - Tapolina wants to conduct workshops
        - Urinary tract infections
        - Infection after circumcision
    - MCC will provide extra information about this topics and will stay in contact with Tapolina if more information on different subject is needed. Furthermore MCC will look if there are education films about child marriage.
- Communication: for a good collaboration throughout the year, good communication and follow-up of the children is warranted
    - Tapolina will provide communication together with Sarangeeta with MCC
    - General agreement every 3 month report to MCC
- Dr Chandra will provide a copy of the last blood samples taken
- MCC provides an overview about the blood result and stool samples with advices per specific case.
- Next medical camp performed by YMWS will be in September. Preferably in lead by 3-4 teachers who have good knowledge about health. They measure height, length en provide 2 prophylactic anti-worm treatments and report on the special cases. MCC provides WHO reference curves for height and weight, so the teachers could interpret weight en height.
- If financially possible, MCC advises to have a nurse who works together with Mr Doctor Chandra to follow-up all the children and homeopathic and allopathic treatment can be used together.
- Next date for a medical camp with MCC in 2016 around 25th of January or between 15th of February and the 15of March. Shourabh will be informed in time about a new date in 2016.
- At the 3th school in Ragnatipur especially the older children are relatively healthy. Shourabh will see if other schools will be (more) appropriate for a medical camp next year.

On behalf of the MCC Kolkata 2015 team:
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