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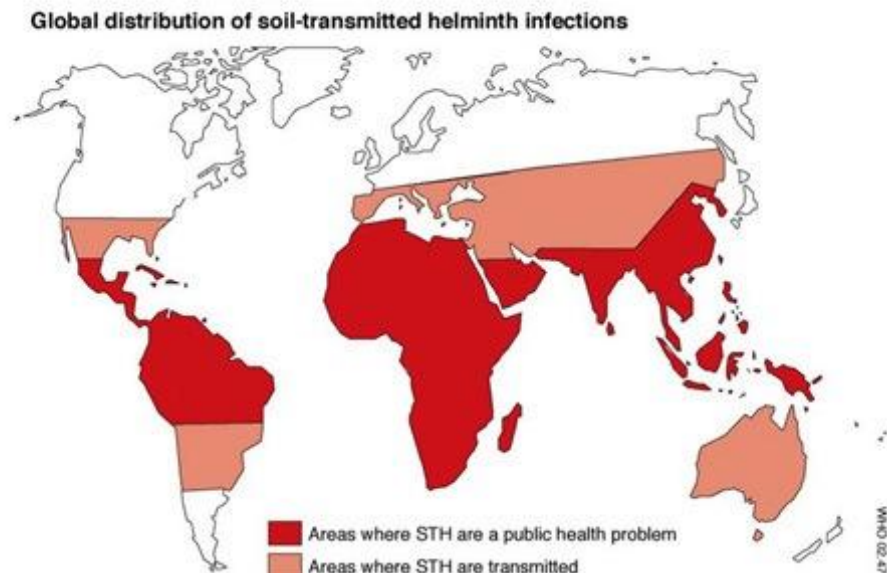


FINAL REPORT: DEWORM GHANA PROGRAM 2012

BACKGROUND INFORMATION

Two billion people world-wide are affected by worms, formally known as Soil Transmitted Helminths (STH) and Schistosomes.¹The common intestinal helminths – hookworms, roundworms and whipworms – are typically contracted via unwashed food or hands, or through direct contact with infected soil. As such, certain occupations such as mining and tea-picking are at high risk along with school-age children due to their high mobility and lower standards of hygiene.²Although most worm infections are not life-threatening, they can cause health problems such as stomach pain, coughing, fever, vomiting, diarrhea, loss of appetite, swollen belly, blood in stools or urine, and fatigue.³

FIGURE 1



The greatest numbers of soil-transmitted helminth infections occur in sub-Saharan Africa, the Americas, China and East Asia.

(Source: <http://www.who.int/wormcontrol/statistics/geographical/en/>)

Children living in developing countries are at the highest risk of contracting intestinal worms; without treatment, these children likely have poor attendance and performance at school and impaired physical and mental development. Worm infections aggravate malnutrition and anaemia which contributes to retarded growth and makes the child more vulnerable to other diseases. Regular deworming contributes to good health and nutrition

¹ www.who.int

² *Ibid.*

³ *Ibid.*

for children of school age, which in turn leads to increased enrolment and attendance, reduced class repetition, and increased educational attainment.⁴ According to a 2004 report by Miguel & Kremer, school-based mass deworming for schistosomiasis and intestinal worms in Kenya reduced absenteeism by one-quarter.⁵

PROJECT SUMMARY

Building on the success of the Deworm Ghana Program 2011⁶, the purpose of the Deworm Ghana Program 2012 is three-fold, (1) to reduce the number of worms in each person, (2) to educate children and their parents on the importance of deworming, and (3) to screen for possible malnutrition in the schools.

In order to achieve the first purpose, Volunteer Partnerships for West Africa (VPWA) embarked on a mission to administer albendazole, a type of medication commonly used to treat intestinal worms, to 5000 children throughout the Akuapim South Municipality of Ghana. As such, a team of volunteers from Ghana, Sweden, the United Kingdom, Italy, Austria, Australia and the United States visited eighteen schools between July 9 and July 18, 2012.

In addition to administering albendazole to children, the team conducted health education with the children at each school to achieve the second purpose of the program. The following topics were discussed:

- 1) What are worms?
- 2) What are the symptoms of worms?
- 3) What is deworming?
- 4) Why is it important to deworm?
- 5) How often should children deworm?
- 6) How can worm infections be prevented?

Whenever possible, VPWA volunteers also met with students' parents to discuss worm infections, the problems that chronic worm infections often cause, as well as the benefits of deworming regularly. These discussions often yielded excellent question and answer sessions that enabled the parents to learn more about the importance of teaching and enforcing good hygiene with their children to ensure good health.

To achieve the third purpose, identifying the children that could potentially be helped by a VPWA malnutrition intervention program in the Akuapim

⁴ Oral presentation, Kwaku Forson Asimenu

⁵ Miguel & Kremer (2004), page 159

⁶ Final Report: Deworm Ghana Program, VPWA (www.deworm.org)

South municipality, height and weight of all the children was recorded. Using this data, it is possible to calculate the body mass index, BMI (defined as weight in kilograms divided by height in meters squared)⁷ of each child and thus gain an indication of whether the child is underweight, overweight or of normal weight. This is motivated by the fact that nearly a quarter of preschool children in Ghana are stunted, and the severity of malnutrition is defined as “medium” at national level.⁸ There are, however, big regional differences in malnutrition levels, and according to the regional nutrition officer, Mr Bismark Sarkodie, the Akuapim South district is among eight districts with the highest prevalence of malnutrition, more precisely over 10% of the children were reported severely stunted.⁹

MEASURING BMI

Since a child’s BMI changes as they mature, assessing the BMI for children is more complicated than for adults and fixed thresholds cannot be applied. Instead, children’s BMI is classified using thresholds that take the child’s age and sex into account. These BMI thresholds are usually derived from a reference population, known as a child growth reference, and defined in terms of a specific z score, or percentile, on a child growth reference. A BMI z score, or standard deviation score, indicates how many units of the standard deviation a child’s BMI is above or below the average BMI value for their age group and sex.¹⁰

We have chosen to compare the data gathered during the Deworm Ghana Program against World Health Organisation 2007 growth reference 5-19 years/BMI-for-age.¹¹ This is one of the most commonly used BMI references, and the thresholds are readily available on the WHO website. This growth reference was derived from a combination of the USA National Centre for Health Statistics 1977 pooled growth data, and the WHO Multi-centre Growth Reference Study (MGRS) from Brazil, Ghana, Norway, India, Oman, USA.¹²

The thresholds for the WHO 2007 growth reference are based on single standard deviation spacing as follows:

- Thinness < -2SD
- -2SD < Underweight < -1SD
- - 1SD < Normal < +1SD
- +1SD < Overweight < +2SD

⁷Flegal et al (2006), page 755

⁸www.fao.org

⁹ www.modernghana.com

¹⁰National Obesity Observatory (2011), page 2-3

¹¹ www.who.int

¹²National Obesity Observatory (2011), page 7

- Obesity > +2SD

For our analysis we have chosen only to assess the children as underweight (<-1SD), normal, or overweight (>+1SD).

RESULTS

As can be seen in table 1 below, the VPWA's medical outreach via the Deworm Ghana Program 2012 resulted in 4447 students, in the ages of five to eighteen years, receiving deworm medicine. Out of these, 47 percent (2084) were male, and 53 percent (2363) were female. The great majority of the beneficiaries (83 percent) had a normal BMI for their age according to WHO 2007 growth reference, while four percent were assessed as underweight and 13 percent as overweight.

When analyzing the assessments for male and female beneficiaries separately, as can be seen in chart 3 and 4, it is noticeable that there are more female students with a large deviation from the upper normal cut-off point than male students. This implies more extreme overweight among females. According to charts 3 and 4, it seems that the overweight among both males and females is decreasing with age. However, this inference is misleading since there are significantly fewer students above the age of 15, as can be seen in chart 1 and 2.

Table 4 shows that there are large differences in the assessments of the students between the 18 schools covered by the Deworm Ghana Program. Nana Osae Djan Primary has the highest percentage of overweight students for both females and males, 33 percent and 29 percent respectively. Osaebo L/A Primary have the largest proportion of students assessed as underweight, 9 percent females and 22 percent males. It is also worth noting that the overweight rate is higher than the underweight rate in 12 out of 18 schools, as is shown in table 3. Six schools out of the 18 have an underweight rate of five percent or more, whereas 12 schools out of 18 have an overweight rate of five percent or more.

Table 1: Summary statistics

Date	School	Community	Girls Covered	Age Range of Girls	Boys Covered	Age Range of Boys	Total Beneficiaries
09-07-2012	Aburi Methodist Primary School	Aburi	140	6-16	97	6-16	237
09-07-2012	P.W.C.E Demonstration Primary	Aburi	112	6-17	113	5-14	225
10-07-2012	Nsaba Presbyterian Primary	Pokrum – Nsaba	115	5-15	180	6-18	295
10-07-2012	Obodan Presbyterian Primary	Obodan	67	7-17	101	6-17	168
11-07-2012	Nana Osaedjan Primary School	Djankrom	316	6-14	231	6-13	547
11-07-2012	Nsawam Methodist Primary	Djankrom	314	6-18	244	6-16	558
12-07-2012	Dago L/A Primary	Dago	69	5-16	71	6-15	140
12-07-2012	Ahamahama L/A Primary	Kwasikrom	36	6-16	43	6-15	79
13-07-2012	Al-Rathi Islamic Primary	Nsawam Zongo	76	6-15	95	5-16	171
13-07-2012	Al-Badar Islamic School	AdoagyiriZongo	93	5-17	82	5-17	175
16-07-2012	Osaebo L/A Primary	Nsawam	194	5-18	9	11-16	203
16-07-2012	Rev. Father Wieggers R/C Primary	Nsawam	399	6-15	341	6-14	740
16-07-2012	SakyiAgyakwah Primary 'A'	Nsawam	-	-	62	6-14	62
16-07-2012	SakyiAgyakwa Primary 'B'	Nsawam	15	10-15	78	7-18	93
17-07-2012	Ntoaso S.D.A. Primary	Ntoaso	97	5-16	88	5-18	185
17-07-2012	Akuffokrom L/A Basic	Kwaffokrom	68	5-17	81	5-18	149
18-07-2012	Nsawam Presbytarian Primary	Nsawam-central	181	6-16	102	6-17	283
18-07-2012	Oparekrom L/A Primary School	Oparekrom	71	6-15	66	6-16	137
Total			2363		2084		4447

Chart 1: Age distribution of males

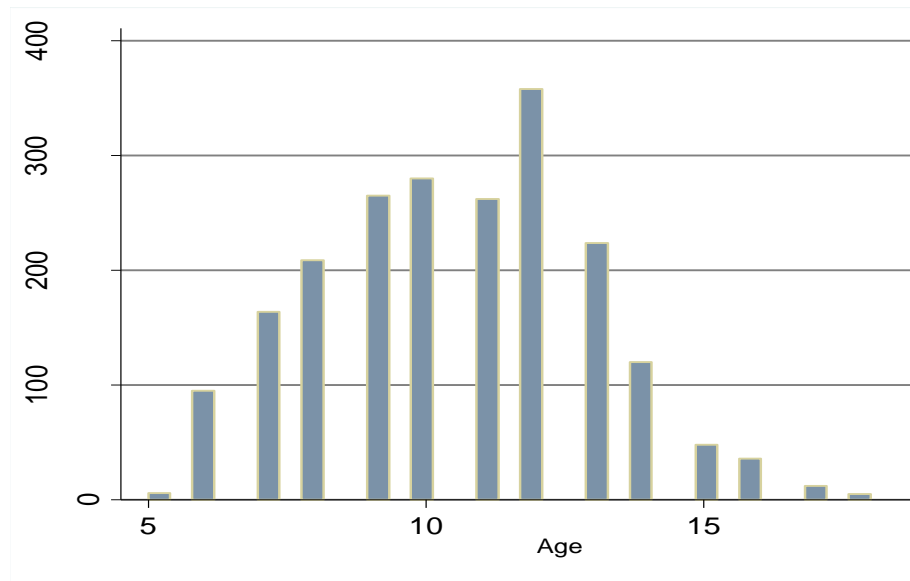


Chart 2: Age distribution of females

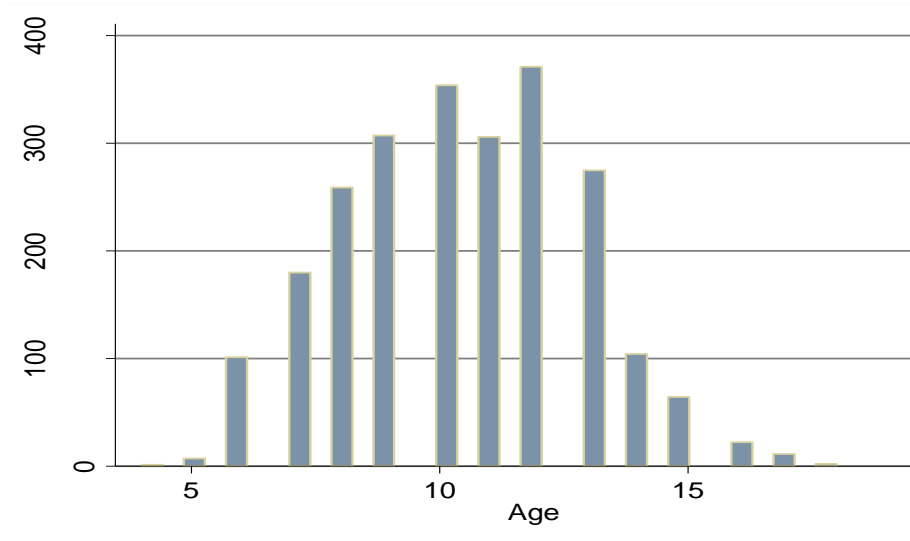


Table 2: Assessments for the whole sample

	% Total	% Females	% Males
Underweight	4	3	4
Normal weight	83	83	84
Overweight	13	14	12

Chart 3: BMI-values and thresholds for males

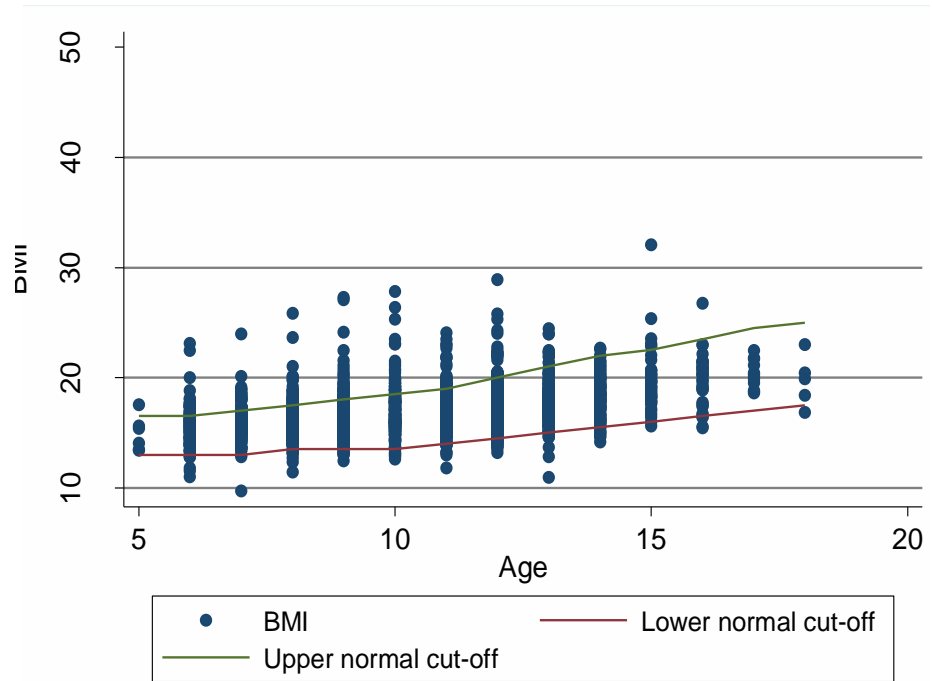


Chart 4: BMI-values with thresholds for female

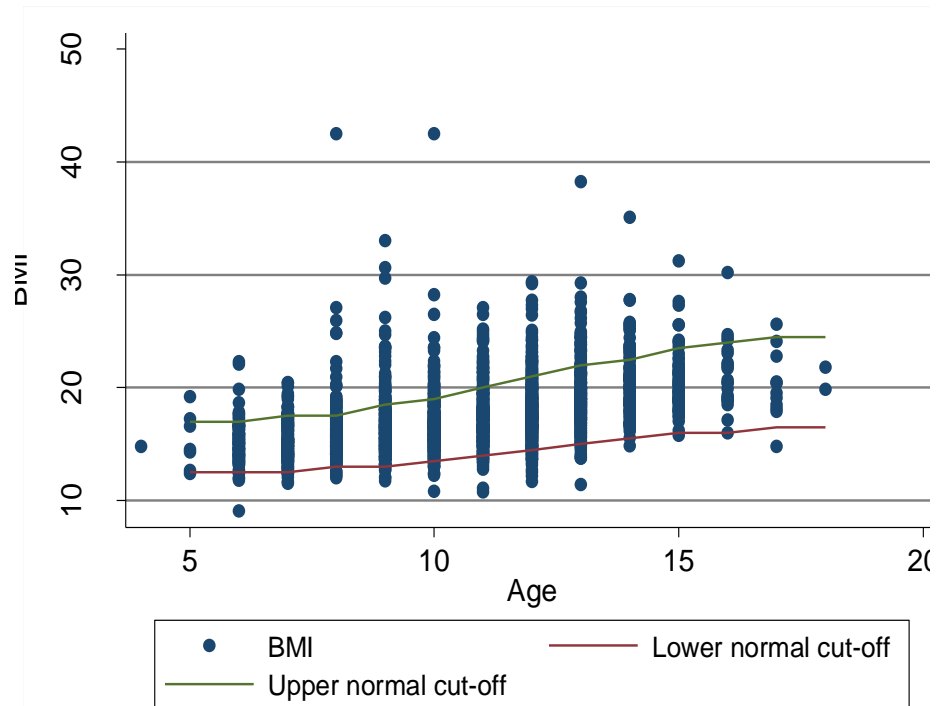


Table 3: Descriptive statistics per school

School	% Underweight	% Normal weight	% Overweight
P.W.C.E. Demonstration Primary	2	81	17
Aburi Methodist Primary School	0	89	11
Obodan Presbyterian Primary	7	89	4
Nasaba Presbyterian Primary	5	87	8
Nana OsaeDjan Primary	1	68	31
Nsawam Methodist Primary	4	81	15
Ahamahama L/A Primary	4	90	6
Dago L/A Primary	8	86	6
Al-Rathi Islamic Primary	2	91	7
Al-Badar Islamic School	1	82	17
SakyiAgyakwah Primary 'A'	2	90	8
SakyiAgyakwa Primary 'B'	3	96	1
Osaebo L/A Primary	10	85	5
Rev. Father Wieggers R/C Primary	3	84	13
Ntoaso S.D.A. Primary	8	87	5
Akuffokrom L/A Basic	3	94	3
Oparekrom L/A Primary School	7	92	1
Nsawam Presbytarian Primary	2	83	15

Table 4: Descriptive statistics per school and sex

School	Females			Males		
	% Underweight	% Normal weight	% Overweight	% Underweight	% Normal weight	% Overweight
P.W.C.E. Demonstration Primary	3	82	15	1	80	19
Aburi Methodist Primary School	1	85	14	0	94	6
Obodan Presbyterian Primary	3	91	6	9	88	3
Nasaba Presbyterian Primary	5	91	4	5	84	11
Nana OsaeDjan Primary	1	66	33	1	70	29
Nsawam Methodist Primary	4	86	10	3	75	22
Ahamahama L/A Primary	0	89	11	7	91	2
Dago L/A Primary	7	84	9	10	87	3
Al-Rathi Islamic Primary	1	90	9	3	92	5
Al-Badar Islamic School	1	76	23	1	89	10
SakyiAgyakwah Primary 'A'	-	-	-	2	90	8
SakyiAgyakwa Primary 'B'	0	100	0	4	95	1
Osaabo L/A Primary	9	86	5	22	67	11
Rev. Father Wieggers R/C Primary	3	82	15	2	86	12
Ntoaso S.D.A. Primary	7	86	7	9	88	3
Akuffokrom L/A Basic	3	93	3	3	95	2
Oparekrom L/A Primary School	3	94	3	11	89	0
Nsawam Presbytarian Primary	3	86	11	1	78	21

RECOMMENDATION

With the handing out of deworm medicine to 4447 children the Deworm Ghana Program has successfully reduced the number of children suffering from worms infections in the short-term and thereby achieved the first purpose of the program. Concerning the second purpose, an effort was made to spread the knowledge of how to prevent worm infections, both to the children and to their parents. However, in order to encourage parents to purchase deworming medication for their children, the Ghana Education Service through the Head of Schools and the Parents Teacher Association (PTA) will need to ensure that a higher proportion of parents attend the sessions in subsequent outreach. We recommend sustained deworming at least once a year for the children. We also recommend the Ghana Education Service in collaboration with Ghana Health Service through the School Health Educational Program to follow up on children that have received medication to ensure that their parents treat them for worms in subsequent years. Some kind of follow-up is needed to ensure consistent well-being of the children impacted by the outreach.

When analyzing the BMI values it is clear that out of the total sample in the study, there is a larger percentage of overweight compared to underweight. However, there are large differences between the schools, and some do have relatively high percentage rates of underweight children. These results indicate that there is a need for a nutritional intervention in the Akuapim South Municipality, both to combat under- and overweight. Although, it is important to keep in mind that BMI is a screening tool, not a diagnostic tool. Children with a BMI under or over the chosen reference thresholds do not necessarily have clinical complications or health risks related to underweight or overweight. To assess health status a more in-depth assessment of individual children is required.¹³

¹³Flegal et al (2006), page 757

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