

Baseline Prevalence Survey of Soil Transmitted Helminths in Rajasthan



Summary Report

February 2013

Prepared by Deworm the World Initiative

Produced in partnership with Rajasthan Council of Elementary Education and Department of Secondary Education, Department of Education, Government of Rajasthan; Department of Medical, Health and Family Welfare, Government of Rajasthan; Department of Women and Child Development, Government of Rajasthan; and UNICEF

TABLE OF CONTENTS

ACKNOWLEDGEMENTS.....	ii
ABBREVIATIONS.....	iii
EXECUTIVE SUMMARY	1
BACKGROUND.....	2
SURVEY AIMS AND OBJECTIVES.....	3
SURVEY METHODOLOGY	4
Planning.....	4
Training	5
Survey Design.....	6
Survey Implementation.....	7
Data Collection.....	8
DATA ANALYSIS.....	10
Slide Validation.....	10
Geostatistical Analysis.....	10
RESULTS.....	12
Prevalence of STH.....	12
Model Results.....	14
Ascaris Prediction.....	14
Hookworm Prevalence.....	15
Limitations.....	16
Recommendation.....	17
APPENDICES.....	19

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ABBREVIATIONS

DtWI	Deworm the World Initiative
EPG	Eggs per gram
EVI	Enhanced vegetation index
ICDS	Integrated Child Development Services
ICMR	Indian Council of Medical Research
LST	Land surface temperature
MDA	Mass drug administration
RCEE	Rajasthan Council of Elementary Education
SEQ	Socio-economic questionnaire
SES	Socio-economic status
STH	Soil-transmitted helminths
SWSHE	School Water, Sanitation and Hygiene Education
WASH	Water, sanitation and hygiene
WHO	World Health Organization

EXECUTIVE SUMMARY

Parasitic worm infections (soil-transmitted helminths, or STH) interfere with nutrient uptake, may lead to anemia, malnourishment and impaired mental and physical development, and pose a serious threat to children's health, education, and productivity. School-age children typically have the highest intensity of worm infection of any age group, and India is estimated to have a high burden of disease on account of STH.

Recognising the significant public health impact on the approximate one-third of Rajasthan's population under age 14, the Government of Rajasthan expressed keen interest in implementing a mass deworming programme to treat children throughout the state. The State Departments of Education, Health and Family Welfare, and Women and Child Development, along with UNICEF and Deworm the World Initiative, came together in May 2012 under a Memorandum of Understanding to spearhead the preparedness and execution of such a programme for the state's school-age and preschool-age children. Prior to programme launch, the Deworm the World Initiative (DtWI) carried out a survey in July 2012 to assess the prevalence and intensity of STH in the state's school-age and preschool-age children.

The survey consisted of collecting stool samples from children enrolled in schools and anganwadis across 13 districts of Rajasthan, along with administration of a socio-economic questionnaire and demographic assessment. Stool samples were read in local laboratories to obtain egg counts for STH, and this data was subsequently analysed and modelled to obtain estimates of worm prevalence. The districts, schools, and children selected for participation in the survey were randomly selected to ensure representativeness of the results for the state as a whole.

The prevalence of *Ascaris* varied between districts from 0-40.6% while the prevalence of *Trichuris* was uniformly low throughout the state. Hookworm survey results were deemed unreliable due to the length of time before slide readings could be verified, although areas where infection was found were noted. Intensity of infection was low for all STH. An alternative strategy based on climatic thresholds for hookworm transmission limits was employed to determine estimated hookworm prevalence for Rajasthan.

Results of modelling suggest a higher risk of *Ascaris* infection in the west of the state, based on the observed prevalence of *Ascaris* and associations with environmental data. Hookworm prevalence in Rajasthan would be expected to oppose that of *Ascaris* and be more prevalent in the east of the state. Given these results, annual deworming treatment throughout the state of Rajasthan is recommended, in line with WHO guidelines for areas considered to be low-risk.

This report documents the study design and survey methodology, presents the analysis of field data and subsequent geostatistical modelling, and provides STH prevalence estimates. While some limitations to the study exist as described in the report, potentially indicating the need for additional data and analysis, it is possible to recommend an annual deworming strategy for Rajasthan as a result of this survey.

BACKGROUND

Soil-transmitted helminths (STH) are an important public health problem responsible for extensive morbidity, especially among school-age children. These infections are most prevalent in tropical and sub-tropical regions of the developing world where adequate water and sanitation are lacking, with recent estimates suggesting that *A. lumbricoides* (Ascaris, or roundworm) infects 1,221 million people, *T. trichiura* (Trichuris, or whipworm) infects 795 million people and hookworms infect 740 million people (de Silva *et al.*, 2003). India is estimated to have a high burden of disease on account of STH.

Worm infections interfere with nutrient uptake, may lead to anemia, malnourishment and impaired mental and physical development, and pose a serious threat to children's health, education, and productivity.¹ School-age children typically have the highest intensity of worm infection of any age group, and therefore suffer the maximum adverse effects. Children infected with this chronic condition are often too sick or too tired to concentrate at school, or to attend school at all. While medications to treat worms are readily available and easily administered, the vast majority of children remain untreated worldwide, and regionally India has the highest number of children requiring treatment.²

Transmission of soil-transmitted helminths

Adult worms inhabit part of the host intestine (*A. lumbricoides* and hookworm in the small intestine, and *T. trichiura* in the colon), then reproduce sexually and produce eggs. These eggs are passed in human faeces and when defecation occurs outside they are deposited in the soil, where they develop to an infective stage and contaminate food crops and the environment in which people live. Infection occurs through accidental ingestion of infective eggs (*A. lumbricoides* and *T. trichiura*) or larval penetration of the skin (hookworm). Distribution and prevalence of parasitic infections are dependent on several ecological factors which influence the life cycle of the parasite, including climate, rainfall, temperature, and type of soil and land cover. Variation in human behaviour, personal hygiene, sanitation and socioeconomic status also play an important role in transmission and distribution of infection.

Rajasthan

In Rajasthan, approximately one-third of the total population is under age 14³, and poor sanitation and hygiene behaviors are prevalent throughout the population. A 2012 study conducted by Panchayati Raj Department, Government of Rajasthan with support from UNICEF looked at household water and sanitation facilities in seven districts of Rajasthan. This study found only 27.3% of households having a toilet in the house, and that the practice of open defecation is rampant and varies across districts, ranging from 54.3% in Bikaner to 88.4% in Dhaulpur.⁴

¹WHO Expert Committee (1987).

²World Health Organization PCT Databank, accessed 9/15/11.

³http://www.censusindia.gov.in/vital_statistics/srs/Chap_2_-_2010.pdf (Statement 5 page 16)

⁴ "WASH Validation in Rajasthan." Presentation by Mott MacDonald, 1/29/13.

In 2012, the Government of Rajasthan expressed a strong interest in initiating a school and anganwadi⁵-based deworming programme in Rajasthan. In order to establish a baseline prevalence and intensity of worms and devise an appropriate treatment strategy, the government requested technical support from the Deworm the World Initiative (DtWI) to conduct a survey of worm prevalence and intensity, for which fieldwork took place in July 2012. As the results of the survey were not available in time to inform the first programme round, the Government of Rajasthan proceeded to implement a state-wide deworming programme in government schools and anganwadis. DtWI assisted the government in this effort, and deworming took place in October 2012, targeting all school-age and preschool-age children in the state. Final results of the first round of deworming are pending as of the writing of this report.

SURVEY AIMS AND OBJECTIVES

An accurate estimation of the prevalence of worm infection is critical to determine the areas where a mass school-based deworming programme should be implemented. Worm prevalence also guides the treatment frequency, in accordance with World Health Organization guidelines that establish treatment thresholds based on percentage of estimated infections, as listed in Table 1 below. Where the prevalence of any STH infection is less than 20%, the WHO does not recommend mass treatment, but rather limiting treatment only to affected individuals. Additionally, the survey acts as a baseline allowing monitoring of the programme for impact. Follow-up surveys are typically undertaken after 2-3 rounds of treatment to determine the impact on worm prevalence and intensity and provide information on whether control programmes should be continued.

Table 1: Recommended control strategies for soil-transmitted helminth infections in school-age children⁶

Category	Prevalence of any STH infection at baseline	Control Strategy	
		Preventive chemotherapy	Additional Interventions
Schools in high-risk areas	≥ 50%	Treat all school-age children (enrolled and non-enrolled) twice a year	Improve sanitation and water supply Provide health education
Schools in low-risk areas	≥ 20% and < 50%	Treat all school-age children (enrolled and non-enrolled) once a year	Improve sanitation and water supply Provide health education

The objectives of the prevalence survey in Rajasthan were to:

1. Train a team of local technicians and community volunteers to carry out a school-based survey for STH using the Kato-Katz laboratory technique.

⁵Anganwadis are government-run day care centers for preschool-age children managed by Integrated Child Development Scheme (ICDS) of the Women and Child Development Department.

⁶ Helminth control in school-age children: A guide for managers of control programmes. Second edition. World Health Organization, 2011.

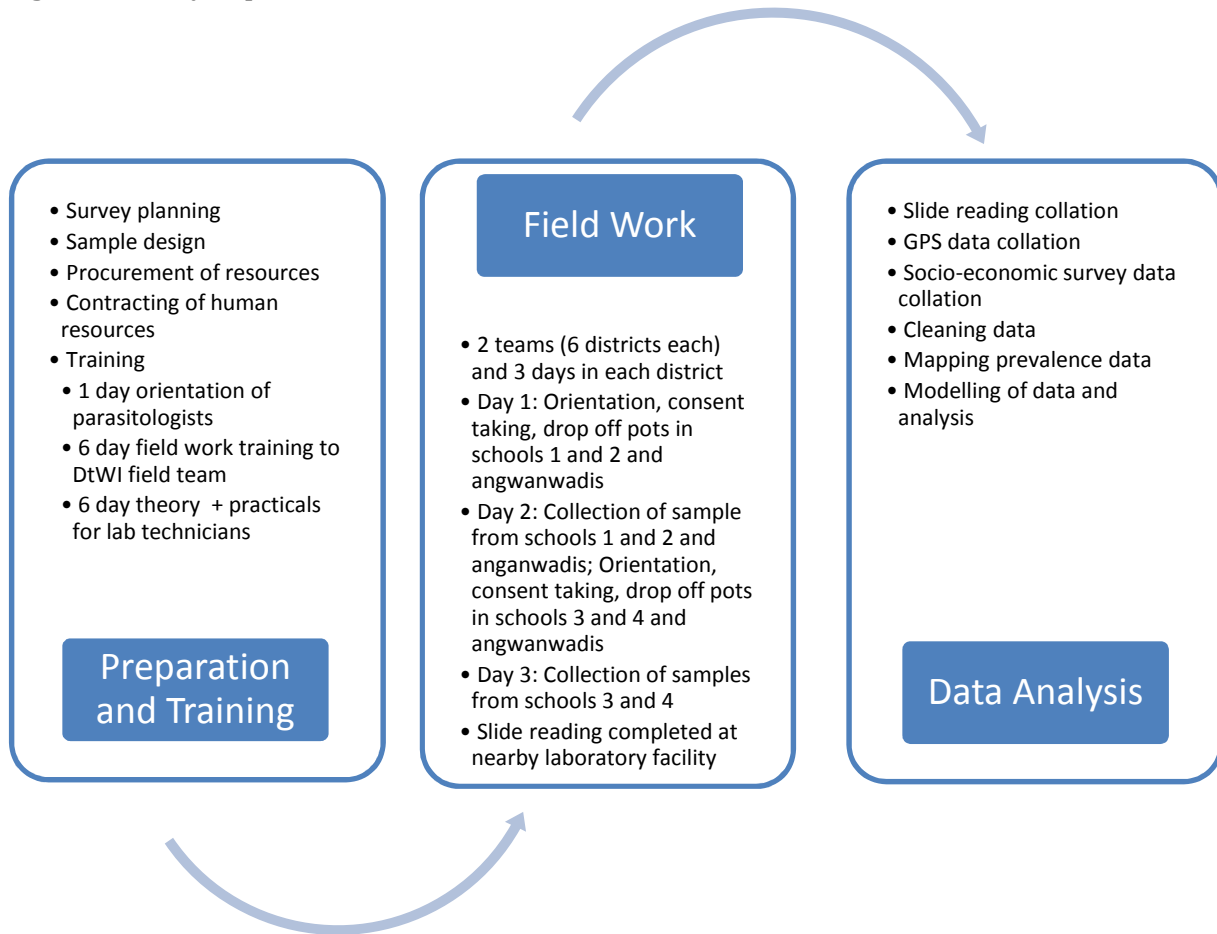
2. Complete STH surveying in 13 districts of Rajasthan, as selected via a scientific sampling strategy to best represent the whole of the state.
3. Provide recommendations to the Government of Rajasthan regarding a STH treatment strategy for the school-age and preschool-age children of Rajasthan.

SURVEY METHODOLOGY

Planning

Planning for the survey was initiated in May 2012, whereby three phases of survey implementation were identified and relevant preparations made (see Figure 1). All relevant materials and survey equipment were readied in a two month period preceding the commencement of the survey in July 2012. DtWI contracted an international expert in parasitology from the University of Kelaniya in Sri Lanka, Dr. Nipul Kithsiri Gunawardena, to provide training of parasitologists and lab technicians in reading STH eggs using the Kato-Katz methodology (described in detail below). Three parasitologists from the National Institute of Cholera and Enteric Diseases in Kolkata, an institute of the Indian Council of Medical Research, were retained to oversee the technical aspects of parasitology. Lab technicians were recruited from a local institute, Dr. B. Lal Institute of Biotechnology, in Jaipur. Community volunteers were contracted in each district to assist with the field component of the survey.

Figure 1: Survey Implementation Phases



Training

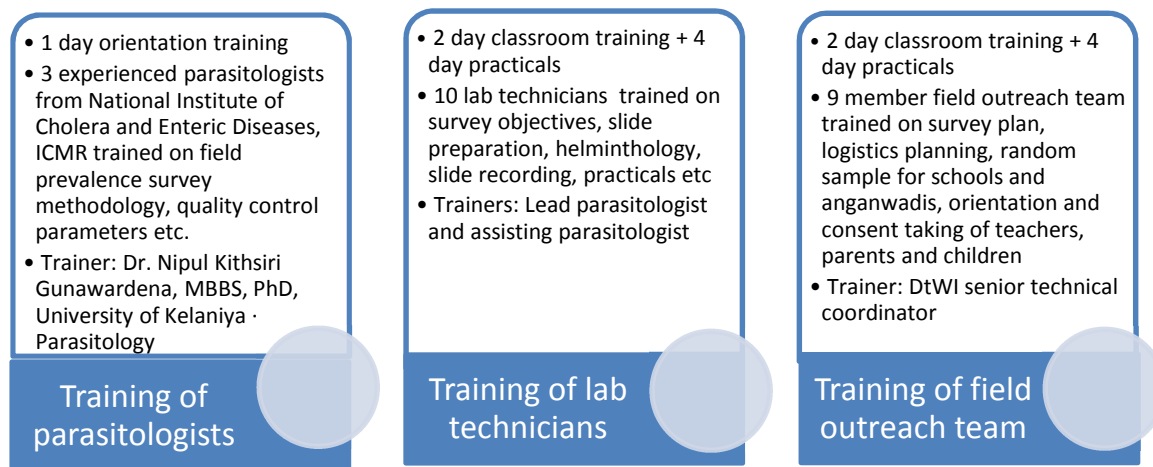
Training introduced the participants to STH, school-based surveying and sample collection. Dr. Gunawardena, an international expert in parasitology with prior experience conducting STH prevalence surveys in India, provided an initial one-day orientation session to the three parasitologists from the National Institute of Cholera and Enteric Diseases. All four parasitologists subsequently led the training of local laboratory technicians on the Kato-Katz survey technique, including two days of classroom-based training on slide preparation and STH egg identification. This was followed by four days of practical field-based training with live samples from slums in Jaipur and Tonk to enable lab technicians to be efficient in reading slides in the field context. Details of the training curriculum are available in Appendix A, Training Material.

DtWI field teams, comprised of staff from DtWI's India and Kenya programmes, played a pivotal role in the exercise by organizing training sessions and leading field logistics. DtWI field teams trained alongside the parasitologists and lab technicians, receiving instruction on the survey methodology and roll-out plan, random sampling of schools and anganwadis, and obtaining consent from survey participants. Three to four community volunteers subsequently engaged in each district were oriented to field survey processes and questionnaire administration by DtWI's senior technical coordinator. These community volunteers administered the socio-economic

questionnaire to the students and the parents of anganwadi children. They helped respondents understand the questions by explaining in local dialects.

Following the training, the group was split into two teams of parasitologists, lab technicians, and DtWI field staff. Each team carried out four weeks of surveying, processing, and slide reading under the supervision of a senior parasitologist and programme manager.

Figure 2: Training Structure



Survey Design

To ensure applicability of survey results from sample sites to the rest of the state, districts and schools within districts were randomly selected. Stool samples were collected from survey participants, a socio-economic questionnaire was given to participants (or their parents, in the case of preschool-age children), and participant height and weight measurements were taken. In each district, a makeshift laboratory was set up to provide space for slide preparation and reading by lab technicians under the guidance of each team’s designated parasitologist.

Selection

District Selection: Due to constraints on both the timing and budget available for the survey, it was determined that the survey would take place in a subset of Rajasthan’s 33 districts. Thirteen districts were randomly selected and compared with secondary data collected for all districts. This information was circulated to the task force⁷ constituted to oversee the prevalence survey, who noted a good spread of key factors expected to influence worm prevalence: elevation, population density, and climate. The above process was essential to ensure that the results are as broadly applicable as possible to the whole state.

Site Selection: Four schools were randomly selected per district from a complete list provided by the RCEE, excluding those with enrolment lower than 30 students, for a total of 52 schools. In the event that a school no longer existed, the nearest school was used in place. Schools were informed

⁷ This task force was comprised of nodal officers from the Departments of Education and Women and Child Development and one representative from DtWI.

of selection and provided with information about the survey by RCEE and Department of Secondary Education ahead of the survey team's arrival and given the choice to not participate in the survey. All schools elected to participate in the survey.

The targeted anganwadis were drawn from the one or two anganwadis nearest to the randomly selected school, as a comprehensive database of anganwadis was unavailable. Since both the enrollment and the attendance at the anganwadis are very low compared to schools, in some cases two anganwadis were selected to reach the required number of participants. Thus every site had one school and one or two anganwadi(s).

Participant Selection: Following receipt of each school's consent to participate, 35 children (aged 6-15) were selected per school. Selection was undertaken by having children from each grade line up, separated by gender, and selecting students randomly from each queue while attempting to have a 50-50 male-female split. From each anganwadi, 24 children (aged 2-5) were randomly selected and invited to participate. Each participant was tracked using a unique ID code, which was labeled on any items provided to the child for survey purposes. A sample return success rate of 85% was anticipated and as such a minimum of 30 samples per school and 20 samples per anganwadi were to be collected for analysis.

Survey Implementation

On the first of two days in each district, the survey team obtained school consent and selected the children. Consent was also obtained from the parents of each participant. Each participant was provided with a pamphlet explaining the consent taking process wherein non-return of sample next day was indicated as reflective of non-consent. Participants were then asked to provide a stool sample the following day. Demographic and socio-economic data were recorded for each participating child, collected by community volunteers. On the second day, sample collection took place. A single sample was given by each child. From each sample, two slides were prepared and read by two different technicians independently.

Districts, schools/anganwadis and children were each assigned a code, so as to have a unique identifier for each participating child. Children and adults who participated in the survey received a small compensation in the form of a packet of biscuits. This compensation was provided to any study participant who arrived at the sample pick up point in the morning. The compensation was provided even in the case that the child has not provided a sample, has chosen to withdraw or parental consent for participation has not been provided.

Informed Consent

Permission, assent and consent were obtained at various levels in line with Rajasthan State Government Regulations; this survey was carried out under the authority of the State Government of Rajasthan to inform their public health and education program.

On the survey day, the survey team repeated all the information and was available to answer any questions or concerns of the head teacher. The head teacher completed a consent form (see School Consent Form in Appendix D) on behalf of the school confirming participation or non-participation.

All school-age children were provided with an awareness flyer (Appendix E). The flyer explained the purpose of the study, how to collect the sample, that participation was voluntary and that withdrawal entailed no penalty, and who to contact for more information. If children returned to school with a sample the following day, parental permission for participation was assumed. For preschool-age children, the same process of consent was taken from the parents.

Two large posters with the same information were also placed in the community and in the school to promote general awareness.

Data Collection

Participant-level Data:

For each participant the following data were recorded on a registration form. All questions were asked of children directly, under the supervision of a class teacher. If the child did not know an answer, a teacher was requested to assist and check the class register where a part of this information is recorded. For anganwadi students, this information was asked from the parent(s).

- *First Name, Surname, and Father's Name:* To allow confirmation of sample 'ownership' when the samples are collected the following day, and to be able to identify those participants requiring treatment after the survey (i.e. test positive for worms). Surnames are often not unique; hence father's name is collected.
- *Age (in years), Sex and Religion:* To allow analysis by basic demographics.

For each participant the following data was recorded immediately after registration on a socio-economic/behavioral questionnaire (Please refer to Socio Economic Questionnaire, Annex 8 to Appendix 1) that was administered by trained community volunteers from that area. The questionnaire was administered in Hindi, with clarifications made in local language where necessary. For school-age children the information was self-reported. For anganwadi children this was reported by the parent(s).

- *Socio-Economic Status (SES):* To allow analysis by basic demographics and to control by SES when looking at hygiene indicators.
- *Access to WASH facilities and hygiene behaviors (hand washing and defecation):* To provide indication of key areas of hygiene improvement or education required.

For each participant the following measures were taken after the socio-economic questionnaire, and together will allow estimations of stunting (low height for age), wasting (low weight for height) and underweight (low weight for age). These will be analyzed individually as associated with worm infection and per school for monitoring.

- *Height/length (cms)* without shoes using adjustable height pole by a trained survey team member
- *Weight (kgs)* without shoes using standardized digital scales by a trained survey team member.

Site-level Data:

For each site the following data was recorded based on observation by a trained survey team member and recorded on the registration form.

- *GPS co-ordinates:* To allow mapping and modeling of results
- *Presence and functionality of latrines:* To provide indication of key areas of hygiene improvement or education required.
- *Presence and functionality of handwashing facilities and water:* To provide indication of key areas of hygiene improvement or education required.

Stool Sample Collection and Analysis

Participants were provided with necessary items for sample collection (pot, newspaper, spatula, information flyer, unique ID card, carrier bag) and explanation of the process. Participants collected their own stool samples the following morning and were asked to bring it to a designated collection point where they were correlated against unique ID and names to ensure no mixing of samples or containers has occurred. A handwashing site was provided along with soap.

Sample Analysis: Stool samples were transported to a local laboratory in a cool box. Samples were analyzed by Kato Katz technique using a World Health Organization (WHO) standard template. The Kato Katz technique is commonly used for detecting STH eggs, as it is relatively simple to apply, requires minimal equipment and lab technicians can be trained in a short amount of time. In this technique, a smear is prepared from fresh stool samples. The sample is sieved through a wire mesh, and then deposited onto a template placed on a glass slide. Cellophane soaked in glycerine-methylene blue is then placed on the deposit, pressed on a soft surface and left to clear for a minimum of 20 minutes, then examined under a microscope. Hookworm eggs are counted within one hour of preparation as eggs would be cleared and no longer visible thereafter. The mean total number of eggs is expressed as eggs per gram (EPG) of faeces.

Two slides (A and B) were created for each sample and were read by separate technicians. The total number of eggs of each STH species in the sample was recorded on parasitology forms. 10% of slides were randomly selected for quality control by a senior parasitologist, and each first positive egg identification per slide was confirmed by a senior parasitologist.

Parasitology Measures:

For each participant, the following data was generated:

- Presence or absence of infection or multiple infections with each and any STH, defined by the detection of eggs in the sample.
- Intensity of each or any infection with STH, calculated using an average of A and B slide egg counts and multiplied to give a standard measure of eggs per gram (epg). Infections were then classified as high, medium and low according to WHO thresholds, as follows in Table 2.

Table 2: Infection intensity definitions by species

Type of Worms	Light intensity infections	Moderate intensity infections	Heavy intensity infections
<i>A. lumbricoides</i> (Roundworms)	1 - 4,999 epg	5,000 - 49,999 epg	50,000 epg and above
<i>T. trichiura</i> (Whipworms)	1 - 999 epg	1,000 - 9,999 epg	10,000 epg and above
Hookworms	1 - 1,999 epg	2,000 - 3,999 epg	4,000 epg and above

DATA ANALYSIS

Slide Validation

From each of the stool samples collected, two slides were prepared (A and B), and each was read by a different lab technician. Upon collation and validation of the slide readings in preparation for analysis, some inconsistencies were reported. In order to mitigate these inconsistencies, all slides were re-read by expert parasitologists. The analysis below is based solely on the re-readings of the slides.

The egg counts for *Ascaris* and *Trichuris* could be re-read and re-validated. However, as the eggs of hookworms decompose within a few hours of the smear preparation, it was not possible to re-validate the hookworm readings. As an alternative measure, and in order to be able to provide some information about the likelihood of hookworm prevalence in Rajasthan, an analysis based on climatic variables shown to have predictive capacity for hookworm viability was undertaken and is presented below.

Geostatistical Analysis

The aim of this analysis was threefold: i) to map district and point level estimates from the survey data, ii) investigate whether environmental and district-level socioeconomic covariates are associated with *Ascaris* in Rajasthan and, if possible, develop a predictive model and iii) due to limitations in data quality for hookworm, discuss evidence for hookworm endemicity in Rajasthan based on available data.

Environmental data were extracted for each site and linked to survey data. Models were adjusted for clustering, included the covariate data outlined below, and incorporated uncertainty associated with sampling error. Models were used to predict the prevalence of *Ascaris* across the state.

Covariate Data

The models include an age covariate for each site, indicating the age range of students surveyed (school-age, preschool-age or from both age groups). Environmental covariates included monthly average land-surface temperature (LST) and precipitation; enhanced vegetation index (EVI; a measure of vegetation density); and elevation. ArcMap 10.1 (ESRI, Redlands, CA) was used to extract information on environmental variables for each point location, which were then linked to field data. Environmental covariates were standardised before modelling. A district level indicator for literacy was extracted from the District Level Household and Facility Survey, conducted in 2007-

8 in all states of India⁸. Indicators were measured from a household questionnaire administered to women aged 15-49 years of age. Additional detail regarding the covariates and related analysis is included in Appendix H.

Summary Statistics

Summary statistics were generated by averaging the egg counts for each species from slide A and B readings and generating a variable indicating the presence or absence of eggs. Numbers examined and numbers positive for each species was generated by site and by district. Mean estimates of STH by district are reported with corresponding binomial confidence intervals, adjusted for clustering. Individuals were categorized as having light, moderate or heavy infections based on criteria set by WHO (1987) as presented in Table 2. Mean intensity by district was reported as including non-infected individuals (i.e., intensity is 0; see Table 3), although the mean intensity of infected individuals was also estimated. Please refer to Appendix H for information on statistical model building.

Table 3: District level prevalence estimates of Ascaris and Trichuris in Rajasthan state

District	Number Examined	Ascaris			Trichuris		
		N positive	Prevalence (%)	Mean Intensity	N positive	Prevalence (%)	Mean Intensity
Barmer	66	14	21.1 (0 - 53.6)	9.1	0	0	0
Bikaner	66	14	21.2 (6.8 - 35.6)	21.6	1	1.5 (0 - 7.6)	1.8
Churu	69	28	40.6 (23.8-57.4)	32.3	0	0	0
Dausa	87	8	9.20 (.5 - 17.9)	8.8	0	0	0
Dhaulpur	154	19	12.3 (2.0 - 22.7)	7.8	0	0	0
Dungarpur	69	5	7.2 (1.2 - 13.3)	2.4	0	0	0
Jaipur	169	19	11.2 (.6 - 21.9)	64.9	0	0	0
Kota	43	0	0	0	0	0	0
Nagaur	107	25	23.3 (0 - 58.7)	10.1	0	0	0
Rajsamand	51	0	0	0	0	0	0
Sawai Madhopur	75	5	6.7 (0 - 15.1)	6.6	0	0	0
Sirohi	64	6	9.4 (0 - 29.4)	6.9	0	0	0
Tonk	143	4	2.8 (.2-5.4)	3.1	0	0	0

⁸Ministry of Health and Family Welfare GoI (2010) District Level Household and Facility Survey 2007-08. Mumbai: International Institute for Population Sciences.

RESULTS

Prevalence of STH

Overall, of 1163 individuals, 143 were found to be infected with *Ascaris* (12.6%). Intensity of infection was low, with 99% of individuals having an intensity less than 150 epg and only 11 individuals with a moderate intensity infection (between 1,000-10,000 epg). Only one individual was found to be positive for *Trichuris*. Hookworm results were deemed unreliable because of the length of time between reading the slides, although areas where infection was found were noted.

The prevalence of *Ascaris* varied between districts from 0-40.6% while the prevalence of *Trichuris* was uniformly low throughout the state. There was a general trend towards lower endemicity of *Ascaris* in the eastern parts of the state, as shown in Figure 3a.

Figure 3a: District-level prevalence of *A. lumbricoides* in Rajasthan state

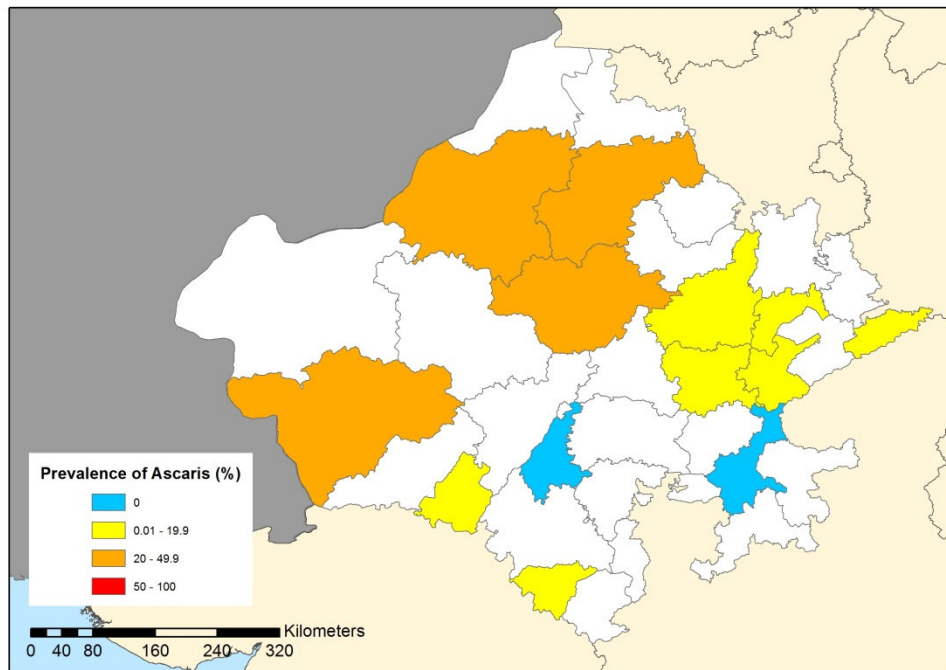
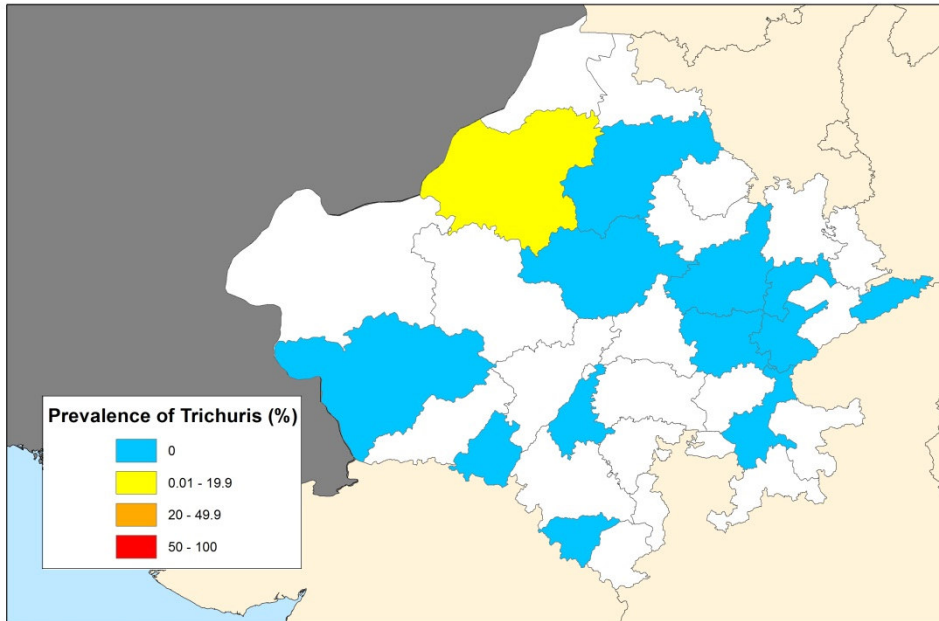
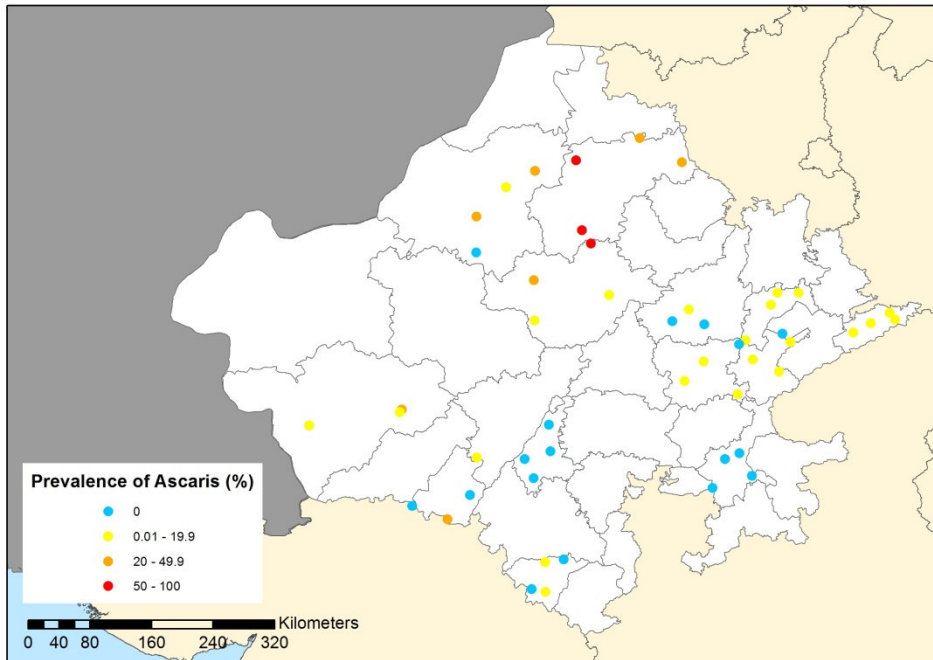


Figure 3b: District-level prevalence of *T. trichiura* in Rajasthan state



Cluster estimates of *Ascaris* prevalence varied more widely across the state (0-67%). These maps are not considered separately as they are unreliable estimates due to small cluster size and likely sampling error; the point prevalence map for *Ascaris* is provided for reference purposes in Figure 4. All clusters with prevalence above 50% had fewer than 20 individuals examined, which may suggest that higher prevalence data may be less reliable in general.

Figure 4: Point prevalence of *A. lumbricoides* in Rajasthan state



Model Results

A number of environmental covariates and district level socio-economic covariates were found to be associated with *Ascaris* in Rajasthan. Several of them, for example EVI, aridity and LST, were collinear and no separate effects could be modelled using these data. Age was not significant in the final model, although there was very weak evidence that preschool-age children have a lower risk of infection compared to older school-age children. The final model included EVI (a measure of vegetation density) and altitude, as well as a geostatistical random effect to account for residual spatial correlation in the data. Prevalence of *Ascaris* decreased in areas of lower vegetation density and at higher altitudes.

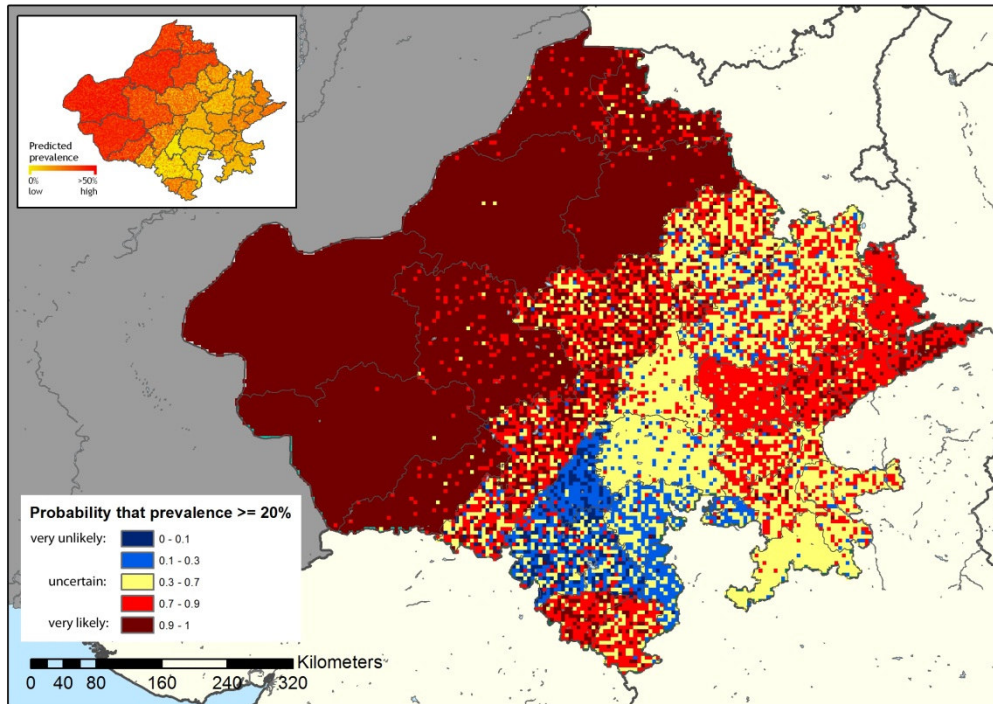
Lower literacy and urban land classification were associated with *Ascaris* infection in preliminary models, which is consistent with other studies which have found *Ascaris* to be a greater risk in peri-urban areas and in areas with lower socioeconomic status⁹. These factors dropped out of the final model.

Ascaris Prediction

Based on this model, areas in western Rajasthan are predicted to have a higher risk of *Ascaris* infection compared to eastern parts of the state. Figure 5 shows the probability that the predicted prevalence of *Ascaris* exceeds 20%, based on a model including EVI and altitude. While there is a high probability that areas in western Rajasthan will require at least annual MDA, there is likely to be a lower prevalence of *Ascaris* throughout the east of Rajasthan. As the map depicts (in yellow), there remain areas in central Rajasthan where transmission may be more unstable based on these environmental covariates, and it is uncertain to what extent treatment might be required.

⁹Pullan RL, Brooker SJ (2012) The global limits and population at risk of soil-transmitted helminth infections in 2010. *Parasit Vectors* 5: 81.

Figure 5: Probability of prevalence of *A. lumbricoides* $\geq 20\%$ in Rajasthan



Although there were strong associations between *Ascaris* and environmental covariates, it does not follow that this model will explain all of the observed variability and will generate reliable predictions. Any model is an approximation, or average fit, to the data which means that some areas where data exist will be overpredicted and some underpredicted. Poor agreement between the predictions and field data can be attributed to two factors. Firstly, the model is based only on 52 points, which may not be enough points to pick up and model complex associations; it is possible that some associations may arise due to chance or that the “best fit” is not a good fit. Secondly, a “state-level” model is on a relatively small scale. While some of the variation may be due to EVI and altitude, other (smaller scale) variation in socioeconomic factors that are not included in the model may be important in determining the distribution of infection. Furthermore, the high-prevalence clusters which are likely to drive these associations have less than 20 individuals sampled and so may be unreliable due to greater sampling variability where the true prevalence is around 50%. Sampling error is accounted for in these models, but associations remain dependent on the data.

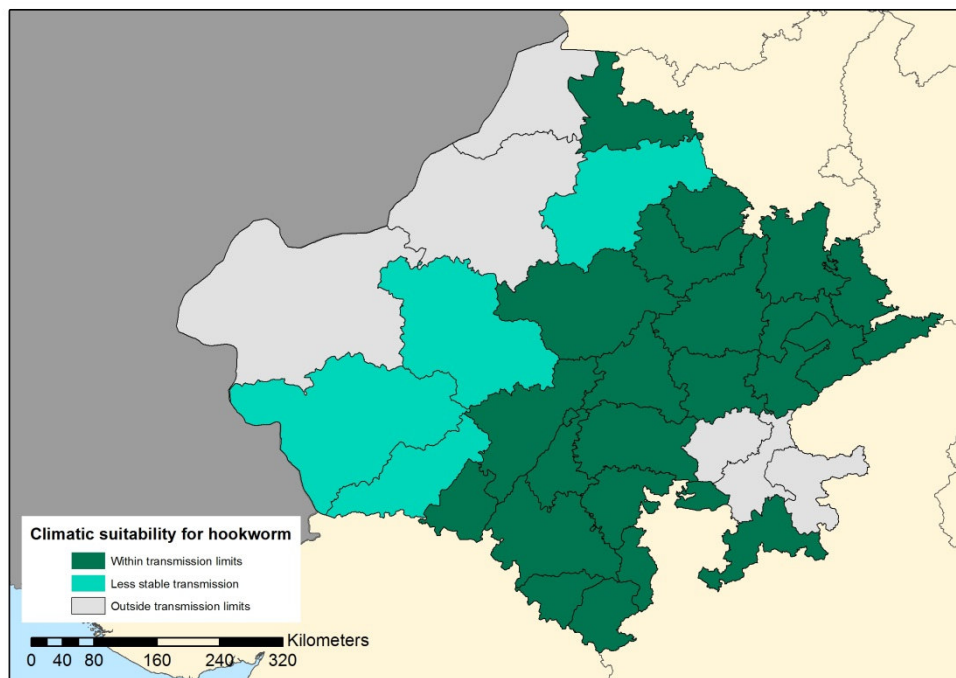
Hookworm Prevalence

Unfortunately, reliable hookworm data were not available for this analysis. Historical data for hookworm in Rajasthan is scarce and ranges from 0-17% collected between 1991 and 2001. Higher prevalence values have been found in the eastern parts of the state (7-17%), where more stable transmission is predicted to occur.

The climatic thresholds for hookworm transmission limits in Asia have been previously modelled using an aridity index, mean and maximum land surface temperature (LST). The map of these limits is shown in Figure 6, which categorises areas as unstable transmission (Mean LSTH 5-10°C, Aridity Index <0.2) or beyond transmission (Max LST >42°C, Mean LSTH <5°C, Aridity Index <0.03). These

limits are based on experimental data showing that the development of infectious stages of hookworm ceases at 40° Celsius, and observed relationships between prevalence and environmental covariates using data from the Global Atlas of Helminth Infections. Based on these limits, the prevalence of hookworm in Rajasthan would be expected to oppose that of *Ascaris* and be more prevalent in the east of the state. All hookworm positive cases identified from this survey originated from areas within transmission limits.

Figure 6: Map of hookworm transmission limits in Rajasthan state, modelled from the mean and maximum land surface temperature and aridity index



Limitations

While findings from this analysis are consistent with the observed trend in *Ascaris* infection across the state, cautious interpretation of these data and the derived predictive model is advised. The scale of this study is much smaller than the majority of risk mapping studies and there was no guarantee that any environmental risk factors would explain the distribution of infection. There were strong associations with a number of risk factors, but as fifty points is generally regarded as the bare minimum for any spatial analysis, the resulting associations may not be as robust (nor as accurate) as they would be with a larger dataset which may limit the predictive ability of the model.

Results also reflect underlying uncertainty in the data, which one might expect to be very high as 20% of the schools sampled examined less than 10 children. This poor response introduces a strong possibility of a bias, which based on the common assumption that risk is higher in non-enrolled children would likely result in an underestimate of prevalence. This highlights the unreliability of enrolment data, as school databases suggested the presence of at least 30 children in each selected school. In addition, all of the schools with prevalence over 50% had fewer than 20 individuals sampled. Sampling simulation studies do show increasing sampling variability in higher prevalence

settings which suggests that these data may be particularly unreliable which may affect the model results.

It is also important to note that the egg counts from the second readings could potentially underestimate the true infection rates. Although eggs of *T. trichiura* and *A. lumbricoides* are visible in the short term, they become paler and more difficult to see in slides that have been stored for more than a week.¹⁰ In addition, diagnostic uncertainty is not incorporated into this model and it is well established that there is high variability in day-to-day egg excretions and a single stool sample may miss infections, particularly in areas where intensity is low.¹¹

Recommendation

The World Health Organization recommends guidelines for mass treatment control strategies for STH infections in school-age children based on worm prevalence rates. As indicated in Table 1 on page 3, bi-annual mass deworming is recommended for areas with greater than 50% prevalence of any STH infection and annual mass deworming for areas between 20-50% prevalence of any STH infection.

In Rajasthan, key study findings include:

- Trichuris prevalence of 0% in 12 of the 13 districts surveyed, with 1.5% in Bikaner district.
- Ascaris prevalence ranged between 0-40.6% across all 13 districts surveyed. 99% of children found infected with Ascaris had light-intensity infections.
- Higher hookworm prevalence is expected in 23 mostly eastern districts of Rajasthan, based on observed relationships between historical prevalence and environmental covariates. Historical data shows higher prevalence values in the eastern parts of the state (7-17%), where more stable transmission is predicted to occur.
- Overall, higher Ascaris prevalence is observed in the more western areas of Rajasthan, while stable transmission of hookworm is likely in the more eastern areas.

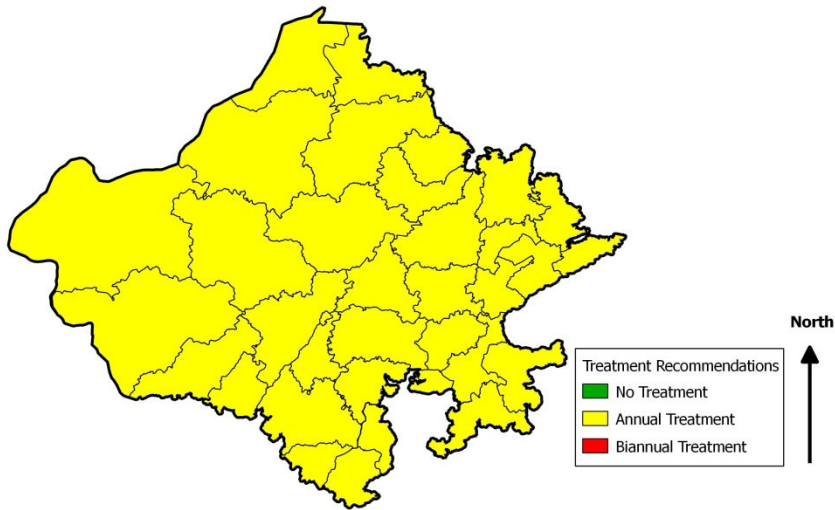
Mass deworming treatment recommendations for Rajasthan follow WHO guidelines and are based on Trichuris and Ascaris prevalence levels in the surveyed districts, observed associations with environmental data, hookworm transmission limits and the possibility that data are an underestimate of the true prevalence. As per WHO guidelines and study findings, annual deworming throughout the state is recommended, as indicated in Figure 7 below.

¹⁰Appleton CC, Kvalsvig JD (2006). A school-based helminth control programme successfully implemented in KwaZulu-Natal. *The Southern African Journal of Epidemiology and Infection* 21: 55-67.

¹¹Knopp S, Mgeni AF, Khamis IS, Steinmann P, Stothard JR, et al. (2008) Diagnosis of soil-transmitted helminths in the era of preventive chemotherapy: effect of multiple stool sampling and use of different diagnostic techniques. *PLoS Negl Trop Dis* 2: e331. Knopp S, Rinaldi L, Khamis IS, Stothard JR, Rollinson D, et al. (2009) A single FLOTAC is more sensitive than triplicate Kato-Katz for the diagnosis of low-intensity soil-transmitted helminth infections. *Trans R Soc Trop Med Hyg* 103: 347-354.

Figure 7: Treatment recommendation for Rajasthan state

Showing STH Treatment Recommendation for Rajasthan State



APPENDICES

- A.** Training Material for Parasitologists and Lab Technicians
- B.** Training Material for Community Volunteers
- C.** Anganwadi Consent Form
- D.** School Consent Form
- E.** Awareness Flyer
- F.** Letter from Education Department
- G.** Letter from the Health Department
- H.** Statistical Analysis and Model Building

Sample Survey for Estimating the Burden of Intestinal Worm Infestation in Rajasthan

Training Material

Sponsored by:

**Department of Medical Health & Family Welfare
Rajasthan Council of Elementary Education
Department of Secondary Education
Department of Women and Child Development
UNICEF, Rajasthan
Deworm The World**

Table of Contents

Objectives of the Training-----	3
The Deworming Programme-----	4
Survey Methodology: Procedure-----	6
• Registration-----	7
○ Preparation Work-----	7
○ Speaking with Head Teacher-----	8
○ Explanation to Assembly-----	10
○ Selection of Children-----	11
○ Working the Registration Table-----	12
○ Giving the SEQ-----	15
○ Measuring Height & Weight -----	18
○ Explanation of Sample to Children-----	19
○ Taking School Details-----	20
○ Completion Checklist-----	22
• Sample Collection-----	23
○ Set Up-----	23
○ Receiving Sample & Checking Data Integrity-----	24
○ Completion Checklist-----	24
• Laboratory Procedure-----	25
○ Preparing Equipment-----	25
○ Preparing Slides-----	26
○ Reading Slides-----	27
○ Lab Organization & Roles-----	29
○ Procedure-----	30
○ Equipment Maintenance-----	33
Data Entry & Management-----	34
Annex-----	35
1. List of Schools and Codings-----	36
2. ID Protocol-----	38
3. Equipment list-----	40
4. Checklist for Anganwadis and Schools-----	41
5. Study Protocols-----	42
6. School Consent Form-----	48
7. Anganwadi Consent Form-----	49
8. SEQ-----	50
9. School Registration Form-----	52
10. Anganwadi Registration Form-----	55
11. Parasitology Form One and Two – Schools-----	58
12. Parasitology Form One and Two – Anganwadi-----	60
13. Quality Control Form-----	62
14. Quality Control Form – Negative Slides-----	63
15. WHO Bench Aids-----	64

Objectives of the Training

The objectives of this course will depend on role within the team, and are outlined as follows:

Lab Technicians should be able to:

- Understand the entire survey process
- Identify intestinal parasites by genus and species
- Make Kato Katz slides
- Quantify eggs by Kato Katz
- Maintain high standards of lab protocol
- Complete the parasitology forms accurately
- Assist in a school when necessary

Technical Managers should be able to:

- Understand the entire survey process from start to finish
- Lead a team in sample collection at a school or anganwadi and ensure the technical integrity of survey methodology
- Work with the senior parasitologists in ensuring the school to lab transition follows protocol
- Understand and implement random sampling in schools and maintain data integrity throughout the survey process
- Manage the data
- Lead logistical preparation for each school visit

Survey Team Members should be able to:

- Understand the entire survey process from start to finish
- Select and register kids, carry out socio economic questionnaires (SEQs), and measure height and weight of children
- Understand and carry out protocols designed to maintain the integrity of the program
- Liasise with teachers, head teachers, and parents in schools
- Ensure high quality and accurate data is collected
- Assist with data entry and management
- Assist with logistical preparation for each school visit

The Deworming Programme



Why a large-scale deworming programme for school-age children?

Over 400 million school-age children worldwide are infected with parasitic worms including soil transmitted helminths and Schistosomiasis. India is estimated to have a high burden soil transmitted helminths, including hookworm, roundworm and whipworm. Children, on account of their behaviour – often barefoot, poor hand hygiene etc. – carry the greatest burden of worm infections in populations. These worms pose a threat to their physical and mental development and impact on their education both short and long term.

Why conduct a prevalence study before a deworming programme?

An accurate estimation of the prevalence of worm infestation is important to decide on the areas where a mass school-based deworming programme should be implemented. It also guides the programme managers to decide if the treatment should be administered every six months, every year or every two years (as stipulated in the WHO guidelines, based on percentage of estimated infections). Lastly the survey acts as a baseline allowing monitoring of the programme for impact.

Commitment of the top leadership for deworming

In pursuit of Education for All and the Millennium Development Goals, governments, UN agencies, the World Bank, and civil society organisations have made deworming an education policy priority. Deworming is increasingly recognised as one of the best buys to support progress towards universal primary education and to improve children's long-term productivity.

In Rajasthan, the Department of Medical Health & Family Welfare, Rajasthan Council of Elementary Education, the Department of Secondary Education, and the Department of Women and Child Development are together leading the proposed mass school-based deworming programme. There is commitment of senior leadership across these ministries/departments to assess the need for mass school-based deworming, and ensure its successful implementation, if such a need is established.

Rationale for implementing a mass school-based deworming programme

In general, school-age children have the highest worm load amongst all age groups, and therefore suffer the maximum adverse effects on account of these worms. These worms harm their health, nutrition and development, and threaten their access to education and learning.

At a programme cost of less than INR 25 per child per year, the model of mass school-based deworming in areas of high prevalence has been found to be the most cost-effective intervention, amongst all such interventions rigorously evaluated, to improve access to education. Mass school-based deworming has been proven to reduce school absenteeism by as much as 25%. In addition, research has

shown that children persistently infected with worms are 13% less likely to be literate and earn 43% less as adults.



Treatment for intestinal worm infestation

There are many drugs available for different kinds of worms. For STHs, Albendazole/Mebendazole is generally the drug of choice. Treatment is inexpensive, easy and safe. Depending on the estimated prevalence of infections, mass treatment by region takes place once every six months, one year or two years.

Success of school-based deworming programmes

To date, Deworm the World (DtW) has supported government-led sustainable, mass school-based deworming programmes covering approximately 37 million school-age children across 27 countries. In India, the programme has been successfully implemented in Andhra Pradesh in 2009, in Bihar in 2011, and in Delhi in 2012. The programme reached 2 million children in Andhra Pradesh, reached 17 million in Bihar, and targeted 3.6 million in Delhi (final outcomes pending).

In all of these regions, the work described is Phase 1 of a campaign which is ongoing. State governments are committed to furthering the program and covering additional districts in subsequent phases. DtW is also in discussions with various other state governments in India to assess the need for, and expand the mass school-based deworming programme in regions of high prevalence.

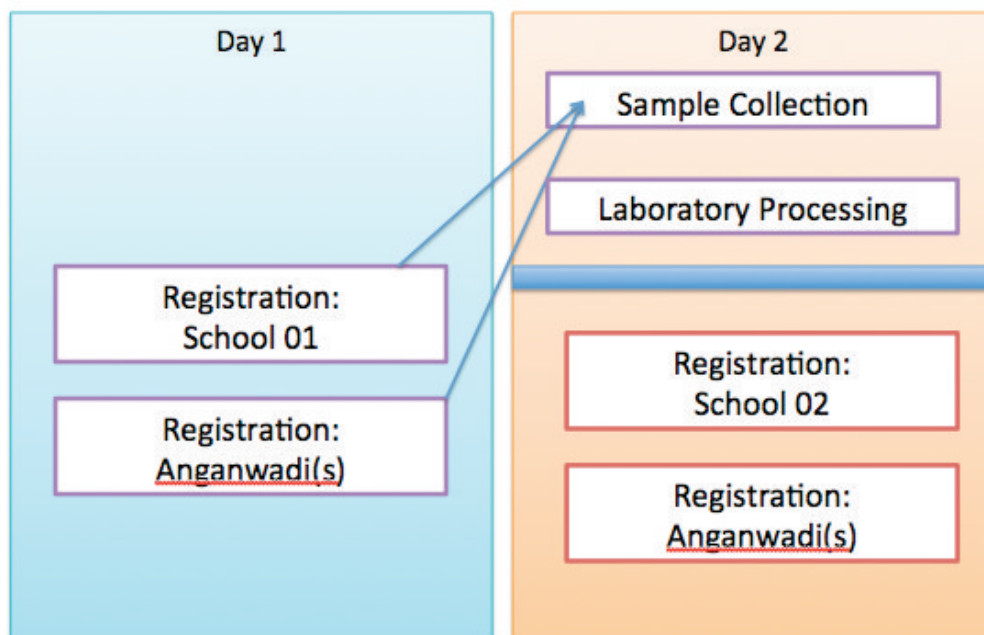
Survey Methodology: Procedure

This section is divided into three stages of procedure: Registration, Sample Collection, and Laboratory. These processes are explained in depth below. A brief explanation here describes how they fit together:

Each school will be visited twice, first for registration and then for sample collection. Both typically occur in the morning, registration after assembly and sample pick up the morning after, as early as possible.

During the registration of each school, one or several anganwadis will also be visited in the vicinity of that school. The team should visit as many as is necessary to register 25 children under 5 years of age. The parents of participating anganwadi children will be asked to drop off their sample at the school collection point the following morning.

After all samples have been collected, they are sent to the laboratory for processing and the cycle of work begins again. A typical timeline looks as follows:



Each component (Registration, Sample Collection, Laboratory Processing) will now be explained in detail.

Registration

0. Preparation Work:

Prior to beginning the Registration process at a school, the team should ensure that certain preparations have been made the night before. The school should be called the day prior to the visit to confirm our arrival. The “school kit,” or collection of materials that must be put together for each school should also be in order.

This includes:

- Inserting the School ID number on the registration form and all socio-economic questionnaires with the school ID number. Additionally, the filling in of school name, address district, block, and village on the school registration form.
- The preparation of all polyester bags that will be given to the children. This includes placing inside each bag a newspaper slip, info flyer, spoon
- Counting of sufficient sample collection pots
- Labelling of sufficient child ID cards
- Consulting map and agreeing departure time and assigned team
- Packing of all equipment required into vehicles. Ensure you have everything on the list here (found on the Equipment List in the Annex)



Preparation of school kit

Registration form (1x school, 3x anganwadi)
Copy of informational letter to school (x2)
Blank School Consent form (x1)
Blank Anganwadi Consent form (x1)
Random sample table (x1 for school x2 for anganwadi)
Flyers (x 60)
Socio-Economic Questionnaires (x60)
Poster (x2 for school)
School checklist (x1 per school x3 per anganwadi)
Spare form set (with technical manager)

Black markers
Pens and pencils
Masking tape
Rubbish bag (x4)
Pots (x60)
Spoons (x60)
Newspaper squares (x60)
Small non-see through bags (x60)
Digital Scales (1 set)
Height Board (1)

1. Speaking with the Head Teacher:

1. Explain the Context

The school head teacher should already have received an informational letter, but you should still go over all components found in the sheet with this heading:

Information for schools: Informed Consent

Bring a fresh copy of this form with you and go through it comprehensively in Hindi and in the local language. Take time to answer questions and do not be coercive in any way. The relevant content of the form is copied below:

Worm infections are very common in children and affect their health and education. The State Government of Rajasthan is implementing a treatment programme. Before implementing this they are surveying to determine where children have most worms and which type they are.

Your school has been randomly selected and is invited to participate in this survey. The results of this survey will be used to plan and inform a state school based deworming programme which will benefit all children in Rajasthan. The survey poses no risk to those taking part.

The survey will be carried out by a team of trained surveyors from an organisation commissioned by the government called Deworm the World. The survey involves the following:

1. Observation of some infrastructure in the school
2. Random selection of 35 children aged 6-14 in your school and 20 children aged 2-5 in the nearest Anganwadi
3. Measuring the height and weight of these children
4. Recording some simple demographic data of these children: age, caste, class, gender
5. Conducting a short questionnaire asking about socio-economic status and handwashing practices
6. Each child will be asked to provide a stool sample the following day and will be given everything required to collect it along with a flyer requesting parental permission for participation.
7. Each participating child's stool will be tested for worm infection
8. Each child will receive compensation for taking part in the form of a small packet of biscuits

Data will be stored in a locked cupboard, and will be encrypted when electronically stored. All uniquely identifying data will remain confidential.

All children found to be infected will be provided with treatment by the national programme. If the national programme is not treating in this school the survey team will provide medicine to any infected children.

The results of the survey will be disseminated back to the school as a general prevalence but otherwise will remain anonymous and individual data will remain confidential and unidentifiable.

Participation in this study is voluntary. There is no penalty for refusing to take part in the survey and you may withdraw from the survey at any time.

2. Get a record of Consent

- When the head teacher understands all components of the information sheet fully, you should ask for a written record of if he or she gives or does not give consent.
- Do not be coercive in getting consent. A headteacher has every right to decline participation without penalty.
- The Consent Form is broken into two sections. Part One, shown here, should be retained by the DtW Team. Please ask the head teacher to initial in the relevant boxes, to write their name, check consent/do not consent, and sign and date the form and stamp with the school stamp.

PART ONE

Head Teacher Name.....

School Name..... District.....

Please initial in the boxes to indicate:

- I have received the information sheet
- The information sheet has been explained to me
- My questions have been answered
- I understand I can withdraw my participation at any time

Please indicate your consent for the participation of your school and students in this STH survey.

I (insert name).....the headteacher

Consent Do Not Consent

for my school and students to participate in the STH survey for the School Based Deworming Programme as described on the information sheet provided to me.

DATE:.....

SIGNATURE HEAD TEACHER:.....

NAME DTWI PROGRAMME MANAGER:.....

SIGNATURE DTWI PROGRAMME MANAGER:.....

- Part Two of the Consent Form should also be filled out but will be retained by the head teacher at the school: You should ensure the School ID is accurately completed at the bottom along with appropriate contact details.

PART TWO

I (insert name).....the head teacher

Consent Do Not Consent

for my school and students to participate in the STH survey for the School Based Deworming Programme as described on the information sheet provided to me.

DATE:.....

SIGNATURE HEAD TEACHER:.....

NAME DTWI PROG. MNGR:.....

SIGNATURE DTWI PROG. MNGR:.....

ANY QUESTIONS PLEASE CALL: 08050505889

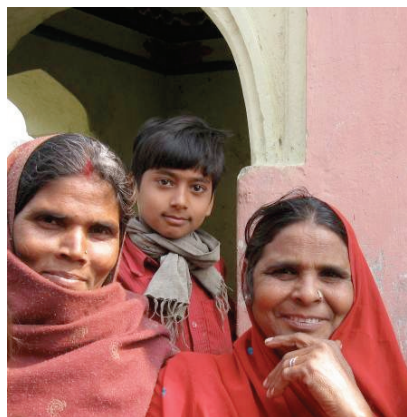
QUOTE the following SCHOOL ID:

3. Ask if Deworming has Occurred Before

- This may require many questions including asking specifically about the filariasis programme and mother and child health weeks.
- If so, ask for the following details: date, who administered, drug type, which classes
 - Consult visitor's book for clarification if necessary
- Record this information on the School Registration form (including if no deworming has occurred)

4. Explain Procedure & Request Help

- Ideally, we would like to gather all children first in an assembly so that we can explain to them briefly and get group assent.
- Afterwards, we request the use of one classroom to set up in, and one teacher to assist.
- With the help of the assisting teacher, we will visit all classes from each STD comprised of children below age 14 and randomly select 35 students total. We will ask those children to come to the classroom where we have set up.
- We will register these children, collect some information (height, weight, socioeconomic status), and we will ask them to bring back a stool sample the next day. This should take a couple of hours total.
- If possible, please also contact the PTA or School Management Committee to invite one or more of them to also attend the survey.
- **Reiterate requests for:** One classroom, one teacher, the calling of a brief assembly of all under-14 age children for explanation.



Invite PTA or SMC volunteers to watch and involve them

2. Explanation to Assembly:

Ask the head teacher to please introduce you to the assembly of children, where you will explain your visit. Give enough detail so they know what is going on but save specifics until you have only those selected to take part. Deliver in Hindi and/or local language. Include:

- Introduction of yourself and where you are from
- Reason for coming: DMHFW is concerned for their health. Want all of them to achieve everything they want to and to do that they have to be able to study well. They can't study well if they are sick.
- We are conducting a survey of all of the country/state/region so we can find out where needs treating for worms and where doesn't.
- This school is one of the ones selected and so we are here to see if they have worms.

Note: The Assembly meeting may not be possible, in which case this sensitization will have to be done for every class.

3. Selection of Children:

The selection of children will be done in each classroom under the age of 14. A team member should visit each classroom (led by the teacher assisting) in order to select students. Follow these instructions.

First, divide 35 by the total number of classes you will visit (to determine this, inquire how many classes there are with students under 14). This will determine how many students you should select from each class. Then divide that number by 2 to determine how many students of each gender you should select in each class. We will call this number X.

To do the selection, you will use a random number table that looks like this:

Class One		Class Two		Class Three		Class Four		Class Five		Class Six		Class Seven		Class Eight	
M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
9	10	3	9	7	6	3	8	4	3	6	8	9	9	10	5
6	1	9	9	2	8	4	9	3	3	1	1	1	9	7	10
10	1	10	3	1	10	5	7	5	8	2	1	10	10	4	5
9	4	2	9	8	8	9	3	4	5	1	4	5	4	3	5
10	2	5	5	6	7	10	7	8	10	10	5	10	2	5	1
5	1	9	5	5	10	7	8	4	1	10	7	8	9	3	7
5	9	4	8	9	6	8	7	8	5	9	7	9	3	1	3
3	5	7	4	7	6	4	1	10	5	9	10	2	5	5	5
9	4	3	2	2	2	1	5	3	3	6	6	5	2	6	9

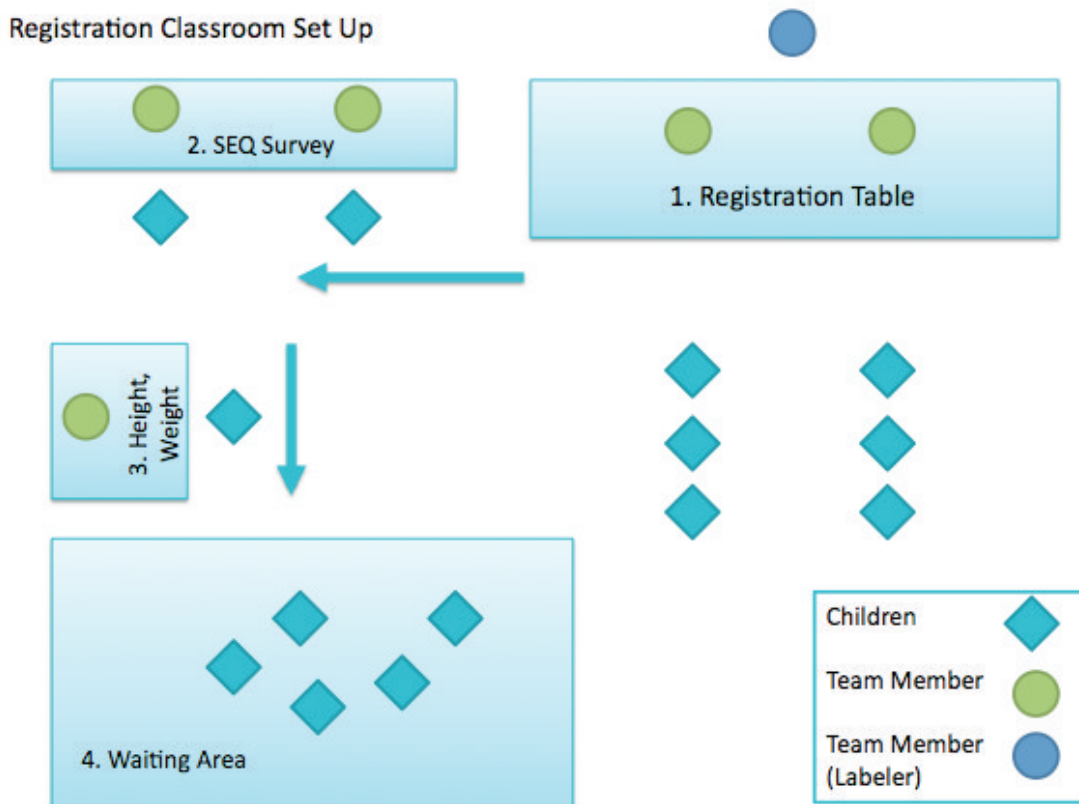
Use one table per school, and use a different column (Class One, Class Two, etc.) for each class. Within each classroom, line up all the children, males in one line and females in another line.

Remember, you need to select in each class X children of each gender. To do so, select the column above for that class and either male or female. Then count down the line of children the number of places of the first number. Select that child and cross out the number. Then count down the second number in the table and select that child. Then the third, fourth, etc for the X number of children you need per gender. If you get to the end of the line of students revert to the beginning. Repeat for the other gender, and then for each class. If you are required to select an odd number of children: EG. 5; select more girls than boys in the first class, then vice versa in the second class and proceed up each class alternating.

Request that the students come with you to the classroom where the DtW team has set up.

4. Working the Registration Table

While the above three steps are being completed, the rest of the team should set up the Registration room to look as follows:



There will be three people present at the Registration Table: two filling out the registration forms, and one in charge of labelling and handing out materials. The procedure for each role is described overleaf.

1. Registration Form

The Registration Form for Schools looks as follows:

<u>School Registration Form</u>	GPS COORDINATES X..... Y.....
School Name.....	School ID : <u> 0 </u> <u> </u> <u> </u> Date://
School Address.....	District..... Block..... Village.....
Other Notes:	

ID No.	Name	Sex	Age	Class	Caste	Religion
001						
002						
003						
004						

The top section for school information should have School Name, School Address, and School ID filled out prior to arriving at the school. Complete the remaining fields in the top section. For now, you can ignore the GPS coordinate box as well as the School Health Facilities section (these will be explained in Step #8).

The main section for registration (grey heading) has 40 rows total, extending up to child ID # 040 and covering two sheets. The two people filling the Registration form should each take one sheet. The person with the second sheet should ensure fields at the very top School ID, school name, and date have been filled and complete if necessary.

Tracking: School ID 0 School _____ Date / /

ID No.	Name	Sex	Age	Class	Caste	Religion

Children who enter the classroom should immediately line up at the registration table in a two-filed line, one in front of each team member. Record their information.

Caste should be classified by General, Backward 1, Backward 2, Overly Backward, Scheduled, Scheduled Tribal and should be obtained through consultation with the register at a convenient

Abbreviation	Caste	Sub-class
GEN	General	
SCH	Scheduled	
ST	Scheduled Tribal	
OBC	Other Backward Castes	
	Muslim	

2. Labelling / Materials

As the child's name is filled in, note their 3 digit child ID No (to the left of their names on the registration form). Give them an ID card with the corresponding number. Label their bag, and SEQ with this 3 digit number using black permanent marker. Label the top of the sample pot with the number and the label with the school ID, 3 digit child ID and their first name in Hindi. Hand the bag to the child after ensuring that it contains the following items:

- sample pot (labelled)
- SEQ (labelled)
- ID card
- info flyer
- piece of newspaper
- Spatula/spoon



Example of a Registration Table

Direct the child to either the height/weight or SEQ station (whichever has a shorter queue).

5. Giving the SEQ

The SEQ station should be set up as shown, with an orderly queue. Effort should be made to maintain as much privacy as possible for the child answering the questionnaire by requesting the others to wait a few feet back.



When child arrives for questionnaire confirm that the questionnaire Child ID on the top of the SEQ form matches their unique ID card and the labels on their bag and pot. If the Child IDs do not match, the issue should be resolved immediately by returning to the registration table and assessing what has happened.

The SEQ is copied below. Follow the survey instructions to complete the questionnaire with the child. Much of this information is quite personal so be aware children may feel shy and encourage them to be honest and feel relaxed, they are not in trouble. With small children be prepared to assist with explanations and give them time. They may also have an older sibling in the school who can help with some of the questions.

<p>1. How many brothers and sisters do you have? <i>Write the number in each space. If zero, write "0", do not leave blank.</i></p>	<p>___ brothers ___ sisters</p>			
<p>2. What type of house do you have? <i>Please circle one. Be prepared to explain to young children.</i></p>	Kuchcha	Semi-Pucca	Pucca	
	Other	Don't Know		
<p>3a. Does your family own land? <i>Circle response and follow arrow</i></p>	No → go to 3b		Yes → go to 3c	
<p>3b. If 3a No: Is your family local or migrated? <i>Circle response</i></p>	Local		Migrant	
	< 1 bigha	1-10 bigha	>10 bigha	Other
<p>3c. If 3a Yes: How much land does your family own? <i>Circle response</i></p>				
<p>4. Select which of these items your father owns? <i>Lay out all the flash cards and ask children to select all the ones they have to one side. Confirm each selection with them as to what they think the picture is. Circle yes for each item the child selects. Confirm each non-selected item with them and circle no or don't know according to if child reports ownership by father.</i></p>				
Bicycle	Yes	No	Don't Know	
Scooter / Motorcycle	Yes	No	Don't Know	
Car / Jeep / Van	Yes	No	Don't Know	
Electricity connection	Yes	No	Don't Know	
Refrigerator	Yes	No	Don't Know	
TV	Yes	No	Don't Know	

	Mobile phone	Yes	No	Don't Know		
	Landline phone	Yes	No	Don't Know		
	Radio	Yes	No	Don't Know		
5. What kind of fuel does your mother use to cook? <i>Circle all that apply</i>	Firewood	Cow dung	Kerosene			
	Coal	LPG/ (bio) gas	Other			
6a. Do you have a latrine in your home? <i>Circle response follow arrow</i> 6b. if 6a is Yes: Which type of latrine? <i>Show the child provided flash cards of different latrines. Circle the picture number they select.</i>	Yes → 6b 1 2 3 4	No → 7	Don't Know → 7			
7. This morning, where did you go to defecate? <i>Use child age appropriate term for defecate and encourage them not to be shy. There is no right/correct answer.</i>	Latrine	Outside	Other	No Answer		
8a. This morning, what was available to immediately cleanse your hand after defecating? <i>Use child age appropriate term for defecation. Circle response (all that apply) and specify for other if needed.</i> 8b. Which one did you use? <i>Circle all that apply</i>	Nothing → go to 9	Ash	Soap	Water	Soil	Other
	Ash	Soap	Water	Soil	Other	
9. What do you use most to cleanse your hands? <i>Circle one answer</i>	Ash	Water	Soil	Other		
10. Can your mother read your textbook? <i>Circle answer</i>	Yes	No	No Answer			
11. What level STD did your mother pass?	None	Less than STD 6	Finish STD 6	Attended Secondary School		
	Has a Diploma	Don't Know	No Mother	Other _____		
12. What job does the chief wage earner in your household do? <i>For younger children you should to explain what the chief wage earner is. If more than one occupation, ask about main job. Classify the occupation into one of the categories to the right. Write the occupation on the dotted lines that correlates to the category. For example:</i> Petty trader: <u>Sells street food</u>	Laborer..... Skilled worker..... Farmer..... Petty trader..... Shop owner..... Service Person..... Don't know..... Other.....					
13. Where do you get water for drinking?	Tapped water in house	Tapped water outside house	Hand pump			
	River/lake water	Well	Other			

14. How does your family process your water?	With nothing	Boiled	Filtered in muslin/cloth
	Added with alum	Other	Don't Know
15. <i>By Observation:</i> What shoes are you wearing now? <i>Check the child's feet as they are standing there and circle the observation you make.</i>	Barefoot → Go to 16	Chappals → Survey complete	Closed shoe → Survey complete
16a. <i>If 15 barefoot:</i> Did you wear anything on your feet to come to school today?	Yes → 16b	No → survey complete	
	16b. What did you wear? <i>Request children to collect shoes and bring them to you, record according to observation</i>	Chappals → Survey complete	Closed shoe → survey complete
		Sandals/ open shoes → survey complete	

For Questions #4 and #6, use flashcards as directed. For Question #15, physically check the child's shoes as shown in the second picture above.

After completing the SEQ, if height and weight is also completed retain questionnaire. If height and weight not recorded send child to height / weight station for measurement.

6. Measuring Height & Weight

When child arrives for height and weight confirm questionnaire ID with unique ID card and labelled survey items.

To take Height:

All children should be able to have their height recorded standing. Ensure that measurement on the wall is prepared carefully. Check that shoes, socks and hair ornaments (if they would interfere with measurement) have been removed.

Follow these steps:

1. Help the child stand against the wall with feet slightly apart. The back of the head, shoulder blades, buttocks, calves, and heels should all touch the vertical board or wall. If necessary, push gently on the tummy to help the child stand to full height
2. Ask the child to position his or her head so that their eyes stare straight ahead. Help them to tilt their head correctly if necessary.
3. Place a clipboard or other flat instrument so that it rests firmly on top of the head and compresses the hair.
4. Read the measurement and record the child's height in centimetres to the last completed 0.1 cm.



To take Weight:

Check that shoes have been removed before weighing each child. Be sure that the scale is placed on a flat, hard surface. Follow these steps:

1. To turn on the scale. When the number 0.0 appears, the scale is ready.
2. Ask the child to stand in the middle of the scale, feet slightly apart, and to remain still until the weight appears on the display.
3. Record the child's weight to the nearest 0.1 kg.

Height and weight should be written on the SEQ questionnaire on the space provided:

WEIGHT:.....KGS

HEIGHT:.....CMS

After taking both height and weight, if questionnaire is filled retain it. If questionnaire is unfilled send child to SEQ station for completion.

Questionnaires should be counted and set in order immediately during the explanation (below). Any problems should be immediately rectified if possible.

7. Explanation of Sample to Children

Once all children have completed their form and are gathered, explain to them the steps that they will need to take in order to prepare and return a stool sample. This explanation should be done in the local language using appropriate terminology and include the representative from the PTA/SMC if possible. Include the following:



- Review why we are taking samples and the overall idea of the programme
- Get children's buy in and ascent to participate by a show of hands.
- Explain to children the importance of the ID. Get them to hold up each item in the bag to ensure they have it and to confirm the number on each thing.
- Ask them to show their parents the flyer in their bag when they return home, and request that their parents read it
- If their parent agrees for them to participate, ask them to do the following:
 1. Defecate on the newspaper (not on the ground)
 2. Using the spoon provided, fill the pot provided halfway with stool.
 3. Close the pot thoroughly and place it in the bag.
 4. Burn or bury the used paper
 5. Wash their hands afterwards.
 6. Bring the bag with the pot and sample inside to school the next morning at the time agreed on by the school and team. They should also bring the ID card inside their bag.
- Tell the child that they will receive a packet of biscuits as a thank you for participating.
- Ask children to repeat instructions back to you in some way to ensure that they understand. You can even get one child to tell all the others.
- Agree a time with teachers and all students to return samples in the morning. Suggest 7 am or earlier
- Thank the children for their time. Make sure everyone has their bags as they exit.

8. Taking School Details

The taking of school details entails writing down GPS coordinates and completing the School Health Facilities questionnaire section found at the end of the School Registration Form. This can be done at any point during the school visit.

Instructions on how to take GPS coordinates can be found in a supplemental guide.

The School Health Facilities form is copied below. Fill it out according to survey instructions: You should complete this with the full knowledge and support of teachers. Ask them to show you around. Confirm everything by observation, including asking to see the toilets etc. Inform them it is not any kind of test or government inventory, more to understand the challenges they face and how this may contribute to the health of their children.

Information on School Health Facilities: School ID <u>0</u> ___ ___ School _____	
<i>Instructions to you will be in Italics: Answer questions by speaking with teachers, confirm all by direct observation</i>	
1a. Do you have a community latrine in this village? <i>Please check yes or no.</i>	<input type="checkbox"/> Yes → 1b <input type="checkbox"/> No → 2
1b. If yes, how many latrines are available for general community use? <i>Please write in #.</i>	_____
2. Previous Deworming Information (<i>as much detail as possible</i>):	
Program: _____ Date (month/year.): __ / ____ Name of drug used _____	
3. Total Enrollment in School	Girls _____ Boys _____
5. Number of latrines: <i>Please fill in the # of each type, include ALL latrines functioning or not. Sum the total at the bottom.</i>	For Student Boys _____ For Student Girls _____ For Student Unisex _____ For Teachers _____ Total Latrines (<i>sum all the above</i>) _____
6. Number of latrines with the following characteristics: <i>Please fill in the # that fit each characteristic. Note that each sub-group (eg. 6a) should add to the total # of latrines above.</i>	6a. Locked _____ Not locked _____
	6b. Water _____ No water _____
	6c. Serviceable _____ Not serviceable _____
	6d. Appear in use _____ Do not appear in use _____
	6e. No attached hand-washing site _____ Attached hand-washing site no water _____ Attached hand-washing site with just water _____ Attached hand-washing site with water and soap _____

	6f. Earth floor around latrine _____ Concrete floor around latrine_____ Ceramic/Tiled around latrine_____
7. Water supply to school <i>Check all that apply to indicate facilities and functionality.</i>	<input type="checkbox"/> Mains tapped water <input type="checkbox"/> Manual well <input type="checkbox"/> Hand pump <input type="checkbox"/> Rainwater tanks <input type="checkbox"/> Collected from local source <input type="checkbox"/> No water at school <input type="checkbox"/> Hand pump is locked <input type="checkbox"/> Well is locked <input type="checkbox"/> Tap is dry <input type="checkbox"/> Well is dry <input type="checkbox"/> Rainwater tank empty
8a. Are there hand washing sites <i>Please check yes or no.</i> 8b. How many sites with each of the following: <i>Please write in numbers of each.</i>	<input type="checkbox"/> Yes → 8b <input type="checkbox"/> No → 9 Water only _____ Water + soap _____ No Water or Soap _____
9. Is there a hygiene poster visible in the school?	<input type="checkbox"/> Yes <input type="checkbox"/> No

9. Completion Checklist

Once all of the above steps have been completed, the following checklist should be completed before leaving the school: Before leaving ensure everything is tidy, thanks the teachers and headteacher and reconfirm the time for collecting the sample.

CHECKLIST FOR ANGANWADIS AND SCHOOLS

School/ANW ID ___ ___ ___ School/ANW _____ Date ___ / ___ / ___

Registration Checklist:

Actions

- Consent process followed
- Poster is put up in school
- All equipment is packed away
- Classroom utilised is clean and tidy
- Any data integrity issues amended

Forms on File

- Registration form:
 - Filled out with details for each child (and parent consent (ANW only))
 - School sanitation survey is completed
 - GPS coordinates filled in
- Consent form signed and Part Two retained by school
- 1 complete SEQ for each registered child with school and child IDs filled on each
- Agreed collection time is : __: __ am tomorrow

Signature of Technical Manager:..... Date:.....

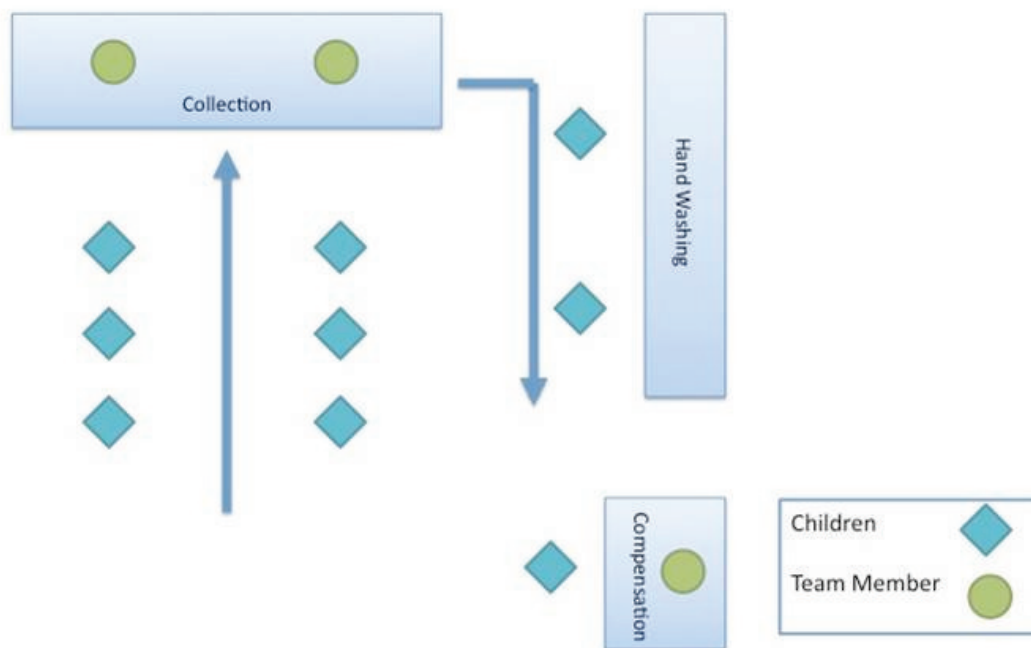
Sample Collection

Sample Collection will occur at all schools on the morning after Registration, at the time agreed upon the previous day.

1. Set Up

The team should arrive on site at the school the morning in time to set up before the allocated collection time. This is usually around 7 am. Set up should resemble the following image and should be in an obvious and central place:

Sample Pick-Up Set Up



Prior to the sample collection the team should have established any errors or missing data in what was collected the previous day and should travel to the school with the equipment necessary to correct it. The equipment list in the packs details exactly what a team needs with them.

2. Receiving Sample & Checking Data Integrity

As children arrive, they should be directed into two lines to the collection table, where team members will receive their samples. At this point the team members should:

- Ensure that the ID card in the child's bag matches the child ID labelled on their pot.
- Ask the child's name and ensure that the name and sample match on the registration form
- Check each container to ensure that it holds a sample.

If there is no sample: Have a teacher or trusted person explain the procedure again to the child and ask them to try again. If the child still returns with no sample they should still get the compensation.

If there is a sample mix up check if they are returning a sample on behalf of anyone else. If they are, ensure the sample is from that person and check that name against the register. If the numbers still do not match, accept the sample and provide the compensation. Set the sample aside and mark a cross on the top of the lid to denote that it should not be processed when the laboratory is reached.

At this point, any problems in prior data collection should also be resolved. For instance, if a SEQ is missing, the team should complete a new questionnaire with that child. If a question of an incorrect ID on a questionnaire exists the questionnaire should be re-done. This should be done by someone other than the team members at the table, once the child with the flagged ID has been identified at the collection point.

After the child submits their sample, direct them to the hand-washing station. From there, they will proceed to receive a small compensation gift.

3. Completion Checklist

After receiving at least 50 samples including 20 from under 5s, the team should fill out the following checklist to ensure all steps at that school have been completed. The Sample Collection checklist is found on the same one-page document as the Registration Checklist shown above, and must be signed by the Technical/Programme Manager once complete.

Sample Collection Checklist:

- Number of Samples collected _____ [*should be at least 50 including 20 under 5s*]
- All data integrity issues have been resolved
- All spare flyer bags, number cards, and biscuit wrappers discarded by children have been collected by the team for transport to lab and disposal there

When the checklist is complete and signed and all remaining children on site have finished submitting samples, pack up and send the samples to lab. This should be completed before 11 am to give sufficient time to technicians for analysis.

Laboratory

There are two tasks to focus on in terms of using the Kato Katz cellophane faecal smear methodology. These are preparing slides and reading slides. Each will be examined in turn. Following this, important aspects of lab organization, procedure, and equipment maintenance will be discussed.

Basic rules to be adhered to at all times:

1. Wear your gloves and a lab coat always
2. Follow protocols
3. If you don't know, ask.

1. Preparing Equipment

Each team of technicians will be provided with the following to enable the KK tests to be undertaken:

- Nylon screen of 80 mes
- Plastic templates with a hole of 6 mm on a 1.5 mm thick template, delivering 41.7 mg of faeces
- Plastic spatulas
- Hydrophilic cellophane, soaked in glycerol.
- Newspaper
- Glass Slides



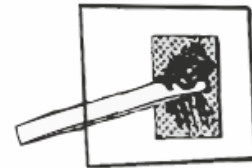
The following preparations must be made *at least 24 hours in advance of preparing your slides and in this case will be carried out by the technicians as part of the training:*

1. Cut an appropriate number of pieces of nylon screen of 30-35 mm
2. Cut an appropriate number of pieces of hydrophilic cellophane of 30-35 mm and place it in the jar
3. Pour the glycerol onto the cellophane strips placed in the jar and leave for at least 24 hours. To increase egg visibility, 1 ml of 3% aqueous malachite green or 3% Methylene blue will be added to the glycerol/water solution.

2. Preparing Slides

The procedure for preparing slides is as follows:

1. Place a small amount of faecal material on the newspaper/scrap paper and press a piece of nylon screen on top so that some of the faeces are sieved through the screen and accumulated on top.
2. Scrape the flat-sided spatula across the upper surface to collect the sieved faeces
3. Place the template on the centre of the microscope slide and add faeces from the spatula so that the hole is completely filled.
4. Pass over the template using the side of the spatula to remove excess faeces from the edge of the hole.
5. Remove the template carefully so that the cylinder of faeces is left on the slide.
6. Repeat for a second slide from the same sample
7. Cover the faecal material on each slide with a pre-soaked cellophane strip. The strip must be very wet if the faeces are dry and less if the faeces are soft. If excess glycerol is present on the upper surface of the cellophane, wipe it with toliet paper). In dry climates, excess glycerol will retard but not prevent drying.
8. Invert the microscope slides and press the faecal sample firmly against the hydrophilic cellophane strip on a smooth hard surface, such as a piece of tile or a flat stone. The faecal material will be spread evenly between the microscope slide and the cellophane strip. It should be possible to read a newspaper print through the smear after clarification.
9. Carefully remove the slides by gently sliding it sideways to avoid separating the cellophane strip or lifting it off. Place the slides on the bench with the cellophane upwards. Water evaporates while the glycerol clears the faeces. To speed up clearing, the slide can be kept in direct sunlight for several minutes.
10. It is important to note that while roundworm (*ascaris lumbricoides*) and whipworm (*trichuris trichiura*) eggs remain visible for months after slide preparation, hookworm (*nector americanus* / *anclyoostoma duodenale*) eggs are no longer recognizable within 30-60 minutes. For this reason, **all slides should be examined within 60 minutes of their preparation.**
11. Once clear and before 60 minutes has passed, each slide should be examined in a systematic manner and the number of eggs of each species reported.



Two slides must be prepared for each sample, labelled A and B. At any given time, there will be one technician preparing slides for two technicians who are reading them. The preparing technician should communicate with those reading the slides to ensure they are being read on time and in order of preparation.

3. Reading Slides

For the purposes of our prevalence study, we will look specifically for eggs of roundworm, hookworm and whipworm. Every frame in a KK slide must be read for all three species of helminth eggs.

All of these worms can be identified by their eggs, which transmit the parasites through passing out of the body in faeces or urine and then contaminating soil or water. Technicians should use the Bench Aids in the Annex, as well as the following information, to identify the correct type of egg under the microscope.

Technicians are encouraged to seek the confirmation of the senior parasitologist for the first egg identification of each species on each slide. The senior technicians are there to assist you and to teach you as well as conduct quality control.

If the slide is not readable due to the smear being too thick or thin, please ask for it to be re-done.

When reading each slide, you should distinguish the different types of eggs, count the number of each, and enter this information into the spaces provided on the appropriate row for the child ID of the sample you are examining.

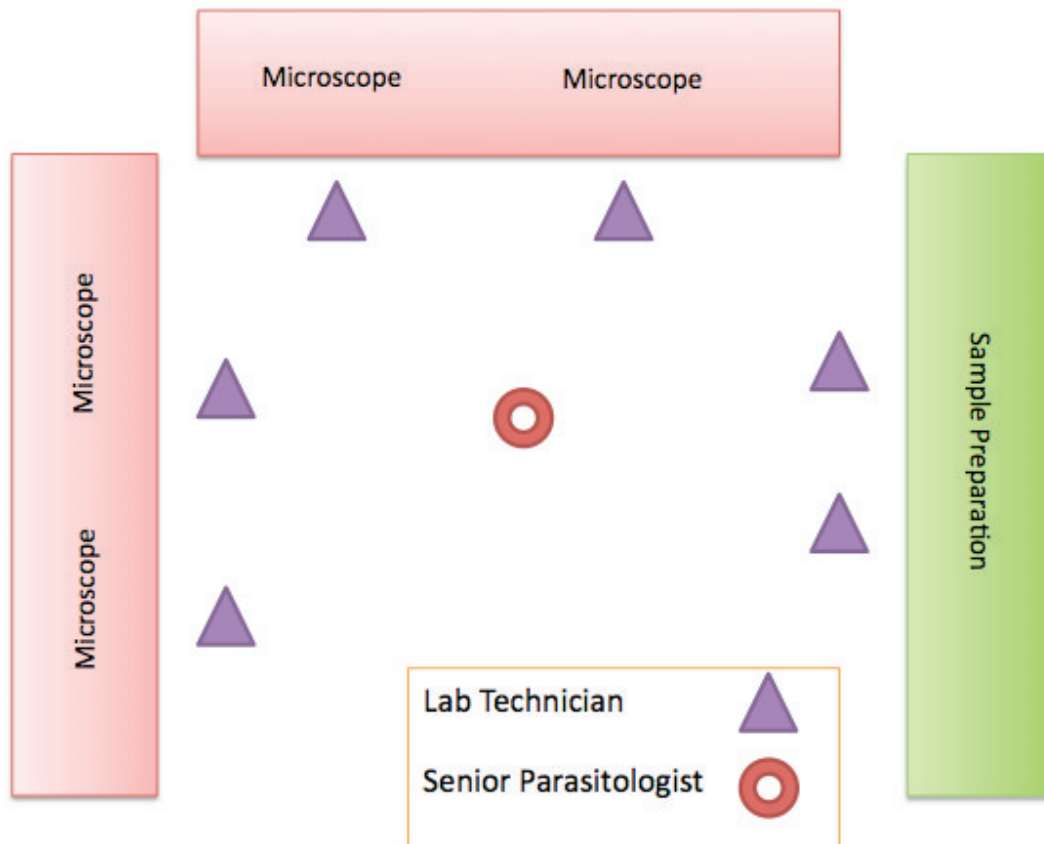
Egg Identification:

<p>Roundworm <i>(Ascaris lumbricoides)</i></p>	<p>Eggs are common (females produce over 200,000 per day) and can be easily found in faeces smears.</p> <p>The fertile egg contains a single-cell ovum, and measures 55-75 μm by 35-50 μm. It is brown in color and the surface of the shell has conspicuous “bumps” called mamillations that are always evident.</p> <p>Occasionally infertile female worms produce eggs whose contents are irregular and disorganized. These eggs are larger (85-95 μm by 43-47 μm) and may have irregular or absent mamillations.</p> <p>Note the comparison between an infertile roundworm egg and a fertile one:</p> <p>Finally, in very rare cases, eggs are produced which lack the surface, mamillated layer. These eggs are “decorticated.” They are about the same size as other fertile eggs and contain the single cell ovum.</p>	
<p>Whipworm <i>(Trichuria trichiura)</i></p>	<p>Female worms present smaller numbers of eggs, so are often present in smaller numbers than roundworm eggs.</p> <p>Eggs measure 50-55 μm by 22-24 μm, have an oval shape, and ‘plug like’ prominences at each pole. The shell is usually dark brown in color and smooth. It contains a single-cell ovum.</p> <p>Note that it is significantly smaller than roundworm eggs:</p>	
<p>Hookworm <i>(Necator americanus / Ancylostoma duodenale)</i></p>	<p>A typical hookworm egg measures 60-75 μm by 36-40 μm. It has a clear, thin shell and the ovum is usually in the 4 or 8 cell stage, or sometimes more advanced.</p> <p>It is important to differentiate hookworm eggs from those of <i>Trichostrongyles</i>. Typically, <i>trichostrongyle</i> eggs resemble hookworm eggs but are larger, 70-95 μm by 40-50 μm. The thin shell is also slightly pointed at one pole, and the ovum is in a more advanced state of segmentation than is seen in the hookworm eggs.</p> <p>The relative sizes of roundworm, whipworm, and hookworm eggs can be seen in this image:</p>	

4. Lab Organization & Roles

Each team will consist of 6 technicians. They will report according to the direction of the senior parasitologist and the technical manager.

Among technicians, there are two key roles in the lab: 1. Making slides, and 2. Reading the slides. *Each person will spend equal time on each.* There will be a publicly available rotation schedule on the wall that shows work assignments. The room will be set up as follows:



The technicians at the two tables with microscopes will be reading samples, while the technicians at the sample preparation tables will be preparing slides. The Senior Parasitologist will be overseeing the process, and conduct random quality control checks on slides read by each technician as well as checking every totally negative slide.

Each day, a lab will read samples from two schools, both of which will arrive around 11 am. Each sample, as mentioned, will be used to create two slides, one labelled A and one B. These slides will be read by different technicians. With 2 schools, 50 samples per school (including under 5s) and two slides per sample, this means that 200 slides must be read each day. Accounting for working 6 hours after 11 am, this means that approximately 34 slides must be read each hour, or 9 slides per reader per hour. On many days samples will come in early. On days where samples come in late, and it is not possible to prepare and read them all, samples will be stored cold over night and prepared first thing the next morning before the next schools arrive.

5. Procedure

The following outlines what should happen each day at the lab.

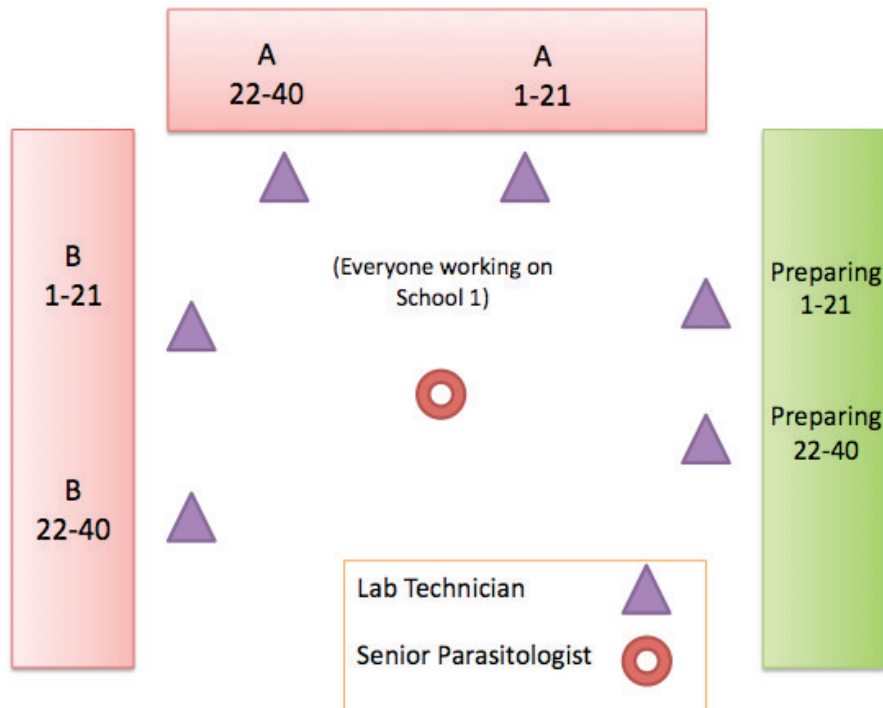
1. Prior to samples arriving, technicians should report to the lab at the time stated by the senior parasitologist. The lab needs to be fully set up and all preparation done before samples arrive.

This includes:

1. Labelling all slides (see image)
2. Setting up slide making equipment
3. Distribution masks, air fresheners
4. Microscope set up
5. Preparing buckets of soapy water and disposal bins

Date	
School ID	
Child ID	
A/B	

2. Samples arrive from schools around 11 am. Arrange the stool samples by school in number order according to their label.
3. One school should be processed at a time. Slides should be processed *in order of child ID*. They should be divided into two batches by child ID to match the break in parasitology form from page 1 to page 2, since different technicians will fill out each page. Within each school, Batch One will be child IDs 001 – 021, and Batch Two will be child IDs 022-040. When the school is an anganwadi slides will be in batches 050-065 and 066-075. At all times, microscopists should have a sign to indicate if they are working on A or B and which set of numbers. This model is depicted below:



4. All technicians should ensure that the slides are placed and read in numerical order of child ID to prevent slides lying around for longer than one hour. Kato production should be paused if the power fails or if the readers can't keep up as slides must be read within one hour of making.
5. For reading technicians: Unread slides should be to the left of your microscope and read ones to the right. If it is very dry and hot keep the slides on wet paper roll to help them stay moist.
6. As soon as each sample is read, the row for that child ID in the parasitologist form should be completed. See Form below. The Reader name is the name of the technician filling that form. Fill out the school code and circle if you are examining A or B slides. Fill out the rows for each child ID. If you get to 006 and there is no 006 slide, confirm with the processing team that 006 was not returned. Do not leave blank – score a line through it. If there are no eggs, put zeros. If the slide is unreadable/sample too small score a line and make a note to that effect.

PARASITOLGY REPORTING FORM: SCHOOL SLIDES 001 - 020

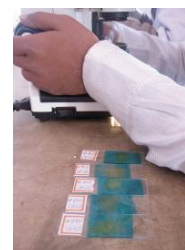
SCHOOL ID.....
 NAME OF PARASITOLOGIST.....

INDICATE BY CIRCLING : **A slides** or **B slides**

Instructions: Process slides in order 001 -018. Complete form immediately when slide is read. Should a slide be missing confirm with slide maker. If slide maker confirms no sample draw a line through the row and write "no sample" in notes. If there are no eggs in sample write a "0". DO NOT LEAVE BLANK. If slide not readable request a new slide, if sample too small or stool not readable draw a line through the row and note the reason.

ID	COUNT EGGS OF EACH STH SPECIES			Other (name)	Other (name)	Notes
	HK	AS	TR			
001						
002						

7. Once slides have been read keep them to the right hand side in the order that they have been read and written down.
8. Senior parasitologists will do random quality control on slides which have been read by each technician. They will also check all negative slides.
9. In order to make this truly random and fair, senior parasitologists will be provided with a random number table for each day and will be picking 10% of each technicians slides using that. The forms they will use to keep track of quality controls, as well as the form used for checking negative slides, are below:
10. Technicians egg counts are expected to be +/- 15% of the quality control egg count



PARASITOLOGY REPORTING FORM: QUALITY CONTROL 10%

DATE:.....

NAME OF SENIOR PARASITOLOGIST:.....

Instructions: Use this to record all QC activities relating to 10% random control. When selecting the slides record the name of the technician originally reading. Read the slide and then record the original technicians counts. Rectify problem with technician and sample if results differ more than +/- 15% egg count or slide positivity.

School ID	Slide ID	Technician Originally reading		COUNT EGGS OF EACH STH SPECIES			Same slide or new slide from same sample (same/new)
				HK	AS	TR	
			QC				
			ORIGINAL				

PARASITOLOGY REPORTING FORM: QUALITY CONTROL NEGATIVE SLIDES

DATE:.....

NAME OF SENIOR PARASITOLOGIST:.....

Instructions: Use this to record all QC activities relating to negative slides. Each negative slide should be checked by a senior parasitologist.

School ID	Slide ID	COUNT EGGS OF EACH STH SPECIES			Same slide or new slide from same sample (same/new)	Slide quality OK? (Yes/No)	Notes
		HK	AS	TR			

6. Equipment Maintenance

Technicians are responsible for the maintenance of equipment and the tidiness of the lab. Note the following key issues:

- Templates and spatulas should be washed, not discarded. Immediately after use drop in hot soapy water, they will soak all day and then be bleached. They will be dried overnight and reused the following day. There will be cleaners, but technicians are responsible for ensuring the equipment is dried and stored appropriately and in the case of no cleaner will be expected to minor washing of equipment.
- Samples and other waste must be properly disposed of. This involves keeping all of them in the sealed containers and rubbish bags until everything is processed. They should then be placed them in a bag and personally taken to the hospital/lab sample destruction site. This is extremely important as these are contaminated samples and violations of this protocol will be taken very seriously.
- Technicians are responsible for preparing the next day's equipment and labelling all slides to ensure complete readiness the next morning.



Data Entry & Management

Data entry is led by the Technical Manager and one other nominated person on the team. A data entry template will be provided and there will be a short training on how to use it and code the data. A coded version of the questionnaire will also be provided. Though these materials will explain the process more fully, a brief description is presented here.

District	School Code	Child Code	Unique ID	Sex	Age	Clas	Caste	Fathers name	AHR	AAs	ATR	BHK	BAs	BTR	AVHK	AVAs	AVTR
3	3001	001	3001001	1	6	1		6 Mohammed Rustom	0	0	0	0	0	0	0	0	0
4	3001	002	3001002	1	6	1		4 Amin Bhagat	0	0	0	0	0	0	0	0	0
5	3001	003	3001003	1	6	1		4 Dush Sah	2	0	3	0	0	2.5	0	0	0
6	3001	004	3001004	1	6	1		4 Shambhu Sah	0	0	0	0	0	0	0	0	0
7	3001	005	3001005	1	6	1		4 Buntal Sah	0	0	0	0	0	0	0	0	0
8	3001	006	3001006	1	6	1		4 Dulari Sah	0	0	0	0	0	0	0	0	0
9	3001	007	3001007	0	6	1		4 Ramesh Sah	12	0	0	0	0	0	6	0	0
10	3001	008	3001008	0	6	1		4 Amin Bhagat	0	0	0	0	0	0	0	0	0
11	3001	009	3001009	0	6	1		1 Naresh Tivari	0	0	4	0	2	0	0	1	2
12	3001	010	3001010	0	6	1		4 Turun Mahro	3	0	0	6	0	0	4.5	0	0
13	3001	011	3001011	0	7	1		4 Blood Mahro	1	0	1	0	0	1	0	0	0
14	3001	012	3001012	0	6	1		4 Jaychan Mahro	7	156	0	2	144	0	4.5	150	0
15	3001	013	3001013	0	7	2		4 Nandalal Bhagh	4	2	0	4	3	0	4	5.5	0
16	3001	014	3001014	0	6	2		4 Kanakhuja Ghoswami	0	0	0	0	0	0	0	0	0
17	3001	015	3001015	0	7	2		4 Bhasat Sah	0	0	0	0	0	0	0	0	0
18	3001	016	3001016	1	6	2		4 Shankar Mahro	9	15	0	26	13	0	17.5	14	0
19	3001	017	3001017	1	3	2		4 Buntal Sah	0	0	0	0	0	0	0	0	0
20	3001	018	3001018	1	6	2		4 Munil Mahro	0	32	0	0	24	0	0	26	0
21	3001	019	3001019	1	3	2		4 Jaychan Mahro	22	8	0	23	7	0	22.5	7.5	0
22	3001	021	3001021	1	3	2		4 Shankar Mahro	15	1	0	3	0	0	3	0.5	0
23	3001	022	3001022	1	3	2		4 late Ramesh Bhagat	0	0	0	0	0	0	0	0	0
24	3001	023	3001023	1	10	3		4 Turun Mahro	2	0	0	0	0	0	1	0	0
25	3001	024	3001024	1	10	3		7 Suresh Rajak	0	0	0	0	0	0	0	0	0
26	3001	025	3001025	1	10	3		4 Erabhu Sah	0	0	0	0	0	0	0	0	0
27	3001	026	3001026	1	10	3		7 Suresh Rajak	0	0	0	0	0	0	0	0	0
28	3001	027	3001027	1	10	3		6 mohammed abdul majid	0	20	0	0	0	0	0	10	0
29	3001	028	3001028	1	11	3		4 Karjay Mahro	1	12	0	1	15	0	1	13.5	0
30	3001	029	3001029	0	3	3		7 Ramesh Rajak	0	0	0	0	0	0	0	0	0
31	3001	030	3001030	0	3	3		4 Amin Bhagat	0	0	0	0	0	0	0	0	0
32	3001	031	3001031	0	10	3		1 Shyamababu Sha	0	0	0	0	0	0	0	0	0
33	3001	032	3001032	0	3	3		4 Mahadeo Bhagat	2	0	0	0	3	0	1	1.5	0
34	3001	033	3001033	0	3	3		4 Shujee Bhagat	0	0	0	0	0	0	0	0	0
35	3001	035	3001035	0	11	3		4 zhampehu Bhagat	1	0	0	1	0	0	1	0	0
36	3001	036	3001036	0	3	3		1 shambhu...	0	0	0	0	0	0	0	0	0

On the evening of registration, all registration forms and SEQs will be entered into the database. Any problems with data will be highlighted on the registration sheets which will be carried to the school the following day during Sample Collection.

For data entry, each district will have a file. The technical manager is responsible for keeping all that district's data organized in that file.

All parasitological data and Quality Control data must also be returned to the technical manager and be entered, with any queries raised directly with the technicians and senior parasitologist.

Data will be entered and stored in excel and must be in a password protected file in an encrypted drive. This will be arranged for you.

Annex

1. List of Schools and Codings
2. ID Protocol
3. Equipment list for 1 school and 3 surrounding anganwadi
4. Checklist for Anganwadis and Schools
5. Study Protocols
6. School Consent Form
7. Anganwadi Consent Form
8. SEQ
9. School Registration Form
10. Anganwadi Registration Form
11. Parasitology Form One and Two – Schools
12. Parasitology Form One and Two – Anganwadi
13. Quality Control Form
14. Quality Control Form – Negative Slides
15. WHO Bench Aids

1. List of Schools and Codings

Code	District
11	BARMER
12	BIKANER
13	CHURU
14	DAUSA
15	DHAULPUR
16	DUNGARPUR
17	JAIPUR
18	KOTA
19	NAGAUR
20	RAJSAMAND
21	SAWAI MADHOPUR
22	SIROHI
23	TONK

District	School ID	School Name
11	001	GPS KOPANADA
11	002	GPS NILSAR
11	003	GPS DEHWA
11	004	SKP VAGTANI BHABHUO KA SARA
12	005	G.P.S. AAWA
12	006	G.P.S. INDRA COLONY, GAJNER
12	007	G.P.S., DELANA BADA
12	008	G.S.S., DHARNOK
13	009	G SEC.SCHOOL DHANI KANDHARAN
13	010	GPS RAJASAR PANWANRAN
13	011	G.SEC.SCHOOL GHANTIYAL BADI
13	012	GSS DHIRVAS CHHOTTA
14	013	GOVT. SS PANDITPURA
14	014	GOVT. PS DAVESTHAN JHOOPDIYA
14	015	GOVT. SS TUDIYANA
14	016	GOVT. UPS JHURAWATON KI DHANI
15	017	GOVT P.S. DURGASI
15	018	GOVT.U.P.S. BOTHPURA
15	019	GOVT U.P.S. BAHADARPUR
15	020	GOVT.P.S. MATHGUSAIN
16	021	G.P.S.KARMAT
16	022	G.P.S. GHANTI PHALA II
16	023	G.P.S. KALARIYA
16	024	G.P.S.NAKA TALAIE
17	025	GOVT PS BURIYO KE DANI
17	026	GOVT PS BEGUS
17	027	GOVT SEC. MOHHABATPURA
17	028	GOVT UPS MANOHARIA WALA
18	029	G.U.P.S. NIMODA

18	030	G.P.S. KAITHON I
18	031	G.P.S. SKS RAIL AWAD
18	032	G.P.S. UMADPURA
19	033	GHSS JOHRI LADNUN
19	034	GPS KALWA BARA
19	035	GUPS TADO KI DHANI
19	036	GPS RATHORI KUWA
20	037	GOVT.SS. DOWADA
20	038	GOVT. PS SHIKSHAKARMI, KUNVATHAL
20	039	GOVT. PS, SOI KI BHAGAL
20	040	GOVT.PS, BALWAS
21	041	G. U.P S SARAY
21	042	G. P.S. DEWATA
21	043	G. P.S. MAHANANDPUR
21	044	G. U.P.S. MAHARO
22	045	G.P.S., AMBBA
22	046	PS_RAMPURA
22	047	G.U.P.S., VASADA
22	048	UPS_ROVARA
23	049	GOVT. SKS BAD GOUR KHURD
23	050	GOVT. PS NAGORIYAN
23	051	GOVT. UPS NATHADI
23	052	GOVT. PS MEENO KA TAPARA DEOLI

2. ID Protocol

Each child will be uniquely identified by an ID that also captures which district and school or anganwadi they come from. The ID system will look as follows:

___ ___ - ___ ___ ___ - ___ ___ ___
district school/angan. child

(There will be no dashes in the actual ID, these were added for clarity).

The coding of each of the three parts of this ID are explained here:

District: These 2 digit IDs will run from 11 – 23, and describe the 13 different districts visited.

School / Anganwadi: This ID divides into two parts.

The second and third digits indicated : __ x x will be the school ID. This will be assigned beforehand to the final list of schools visited, and range from 01 – 52.

The first digit will indicate whether the ID refers to the school itself, or an anganwadi corresponding to that school's location. It is possible that multiple anganwadis could be visited that each correspond to the same school, in order to procure enough samples. Therefore this first digit will code as follows:

- 0 = school itself
- 1 = first anganwadi visited near the school
- 2 = second anganwadi visited near the school
- 3 = third anganwadi visited near the school

Child: The child ID will be taken from each registration form. It will range from 001 – 040 for school children, and from 050 – 075 for anganwadi children.

Procedure:

Throughout the surveying, it will be most important to keep good track of each child's school/anganwadi 3 digit ID and child 3 digit ID. Below describes how IDs will be tracked as a child moves through the registration process.

1. Registration form will be pre-filled with that school/anganwadi ID prior to arriving at that school.
2. When children register, their names will be written next to a 001-075 ID. They will be given:
 - a. An ID card with that 3-digit child ID on it. They will keep this until they complete the process.
 - b. A bag labelled with their 3 digit child ID containing sample collection kit and flyer
 - c. A pot labelled with the school/ anganwadi ID *and* their 3 digit child ID.

- d. A socio-economic survey, labelled with their 3 digit child ID, as well as with the 3 digit school ID. [All school IDs should be filled in on the socio survey ahead of visiting the school].
3. The child will proceed either to the height/weight station or to the socio-economic questionnaire station. At either place, they will give the person at that station their socio-economic survey. Before proceeding, this team member should check to ensure that the child's ID card matches the ID shown on their socio-economic survey and the IDs shown on their bag and on their pot.
4. The height / weight and socio-economic information will then be completed, and the team member that finishes the form will retain it. No child should leave the room until everyone is finished. When all forms are complete, the children will be gathered for an explanation of the samples. During this, the DTW team will count all questionnaires and put them in order to ensure none are missing. If some are, requests will be made for them. (In the case that we still don't have a questionnaire the next day, a new one will be filled out when the child brings the sample.)

Equipment List for 1 School and up to 3 surrounding Anganwadis

For Registration:

Registration form (1xschool, 3xanganwadi)
Copy of informational letter to school (x2)
Blank School Consent form (x1)
Blank Anganwadi Consent form (x1)
Random sample table (x1 for school x2 for anganwadi)
Flyers (x 60)
Socio-Economic Questionnaires (x60)
Latrine Flashcards (x2 sets)
Asset Flashcards (x2 sets)
Poster (x2 for school)
School checklist (x1 per school x3 per anganwadi)
Spare form set (with technical manager)

Black markers
Pens and pencils
Masking tape
Rubbish bag (x4)
Pots (x60)
Spoons (x60)
Newspaper squares (x60)
Small non-see through bags (x60)

Digital Scales (1 set)
Height Board (1)

For Sample Collection:

Completed Registration forms marked with errors for correction
Pens and pencils
Completed SEQ forms, for reference (problems flagged)
Spare form set
Soap and antiseptic for washing
Jerry can of water
Clean towel
Gloves
Compensation gift (60 + 5 spare)
Black bin liners (2)
Cool box

Digital Scales (1 set)
Height board (1)

4. CHECKLIST FOR ANGANWADIS AND SCHOOLS

School/ANW ID ___ ___ ___ School/ANW _____ Date ___ / ___ / ___

Registration Checklist:

Actions

- Consent process followed
- Poster is put up in school
- All equipment is packed away
- Classroom utilised is clean and tidy
- Any data integrity issues amended

Forms on File

- Registration form:
 - Filled out with details for each child (and parent consent (ANW only))
 - School sanitation survey is completed
 - GPS coordinates filled in
- Consent form signed and Part One retained by school
- 1 complete SEQ for each registered child with school and child IDs filled on each
- Agreed collection time is : __: __ am tomorrow

Signature of Technical Manager:..... Date:.....

Sample Collection Checklist:

- Number of Samples collected _____ [should be at least 50 including 20 under 5s]
- All data integrity issues have been resolved
- All spare flyer bags, number cards, and biscuit wrappers discarded by children have been collected by the team for transport to lab and disposal there

Signature of Technical Manager:..... Date:.....

5. Study Protocols

Purpose/Background/Significance

Background: Research demonstrates that School Based Deworming is an effective and cost effective intervention for the improvement of educational and health outcomes for school children in areas where Soil Transmitted Helminths (STH) are a problem. The State Government of Rajasthan with technical support from DTWI intend to roll out a school based deworming programme in late 2012 children aged 2-17 years old.

The proposed survey will occur ahead of the programme roll out to inform targeting of mass treatment through school-based deworming and enable monitoring of the reductions in worm prevalence and intensity. The survey will collect the following data: stool sample collection to analyze the prevalence and intensity of worm infection via eggs in stools; demographic and socio-economic data; observable hygiene and sanitation indicators.

Purpose: To determine the baseline prevalence and intensity of Soil Transmitted Helminths in Rajasthan prior to the roll out of the school based deworming programme.

Significance: The value of this survey is four fold.

1. It allows the Government of Rajasthan to accurately target the deworming programme to areas where worms are prevalent to an extent requiring mass deworming.
2. It provides baseline information that Government of Rajasthan can utilize to monitor and evaluate their deworming programme in terms of drug efficacy and reduction in prevalence and intensity of infection over time.
3. It affords the opportunity to investigate and characterize factors contributing to worm prevalence in Rajasthan including Caste, Socio economic status and hygiene facilities in school.
4. The information on prevalence in Rajasthan will contribute to ongoing predictive mapping of STH throughout all of India, which informs the Government of India in their National and State STH control strategy decisions.

Study Design

Study sites throughout the state will be selected, clustered at district level. Prevalence and intensity of the three STH species will be determined via parasitological methodologies at each site.

Modeling will be utilized to create interpolated prevalence maps for the entire state using identified relationships between the STH prevalence and intensity data gathered in this survey and the following other available data: elevation, rainfall, literacy, temperature, population density.

District Selection: 13 districts in Rajasthan have been randomly selected. The sample is unstratified as 13 districts represents over 40% of those in Rajasthan and gives a clear spread of all the ecological zones.

Site Selection: 4 schools have been randomly selected per district. Schools were selected from a complete list provided by the State Ministry of Education, excluding those with enrolment lower than 30 students. In the event that a school no longer exists, or declines participation, the nearest school will be used in place. Schools will be informed about their selection and provided with information about the study by the government of Rajasthan ahead of the survey team arriving.

Participant Selection: Following consent of Schools to participate, 35 children (aged 6-15) will be randomly selected per school. Children will be selected from each grade, half male and half female. The attached or nearest Anganwadi (preschool/kindergarten) will also be surveyed. Here 24 children (aged 2-5) will be randomly selected and invited to participate. Each participant will be tracked using a unique ID code, which will be labeled on any items provided to the child for survey purposes (see information below).

Data Collected (outside of stool surveys):

For each participant the following data will be recorded on a Registration form. (Appendix One A and One B) They will all be asked directly to the child under the supervision of a class teacher. If the child does not know an answer, a teacher will be requested to assist and check the class register where all this information is recorded. For anganwadi students, this information will be asked from the parent(s).

- *First, Second, and Fathers Name:* To allow confirmation of sample 'ownership' when the samples are collected the following day, and to be able to identify those participants requiring treatment after the survey (i.e. test positive for worms). Surnames (esp. female) are often not unique, hence father's name is collected.
- *Age:* In years, to allow analysis by basic demographics.
- *Sex:* To allow analysis by basic demographics.
- *Religion:* To allow analysis by basic demographics.
- *Caste:* Will be collected in the following broad classifications (local naming conventions used here). General, Backward One, Backward Two, Extremely backward, Scheduled, and Scheduled Tribal. To allow analysis by basic demographics.
- *Grade:* To allow tracking throughout the collection of a complete sample of the grades and easy identification of children who require treatment.

For each participant the following data will be recorded immediately after registration on a socio-economic/behavioral questionnaire that will be administered by trained community volunteers from that area. (Appendix 2). The questionnaire will be administered in Hindi, with clarifications made in local language where necessary. For school aged children this will be self-reported. For anganwadi children this will be reported about the parent(s).

- *Socio-Economic Status (SES):* To allow analysis by basic demographics and to control by SES when looking at hygiene indicators. Socio economic status will be via an index.
- *Access to WASH facilities and hygiene behaviours (handwashing and defecation):* To provide indication of key areas of hygiene improvement or education required.

For each participant the following measures will be taken after the socio-economic questionnaire questions are complete and then recorded with other data on the socio-economic questionnaire. Together these will allow estimations of stunting (low height for age), wasting (low weight for height) and underweight (low weight for age). These will be analyzed individually as associated with worm infection and as a whole per school for monitoring.

- Height/length (cms) without shoes using adjustable height pole by a trained survey team member
- Weight (Kgs) without shoes using standardized digital scales by a trained survey team member.

For each site the following data will be recorded based on observation by a trained survey team member and recorded on the registration form.

- *GIS Co-ordinates:* To allow mapping and modeling of results
- *Presence and Functionality of Latrines:* To provide indication of key areas of hygiene improvement or education required.
- *Presence and functionality of handwashing facilities and water:* To provide indication of key areas of hygiene improvement or education required.

For all the above measures data will be entered into excel the same day. Any data missing will be confirmed or re-taken as sample collection is taking place the following day.

Stool Sample Collection:

Participants will be provided with necessary items (pot, newspaper, spatula, information flyer, unique ID card, carrier bag) and explanation of the process. Participants will collect their own stool samples the following morning and will be asked to bring it to a designated collection point the following morning. Where they will be correlated against unique ID and names to ensure no mixing of samples or containers has occurred. A hand washing site will be provided along with soap and all participants will wash hands after submitting the sample. Samples where any mixing is suspected will be discarded. It is anticipated 85% of samples will be returned and so a minimum of 30 per school and 20 per anganwadi will be collected for analysis.

Sample Analysis: Stool samples will be transported to a local laboratory in a cool box. Samples will be analysed by Kato Katz methodology using a World Health Organization (WHO) standard template. Two slides (A and B) will be created for each sample and will be read by separate technicians. Total number of eggs of each species of helminth within the sample will be recorded on parasitology forms (appendix 3). 10% of slides will be randomly selected for quality control by a senior parasitologist, and each first positive egg identification per slide will be confirmed by a senior parasitologist.

Parasitology Measures:

For each participant: the following data will be generated.

- Presence or absence of infection or multiple infections with each and any soil transmitted helminth, defined by the detection of eggs in the sample examined by parasitologists.
- Intensity of each or any infection with soil transmitted helminth, calculated using an average of A and B egg counts multiplied to give a standard measure of eggs per gram, and classified as high, medium and low according to WHO thresholds.

For each site: the following data will be generated

- Prevalence of each and any soil transmitted helminth at that school or anganwadi, calculated by the sum of infected individuals over total individuals surveyed.

Subject Population:

Population Unit	Detail	Number	Method of selecting	Method of reaching
Districts		13	Random	Gov List: Letter of introduction from government
Schools and nearest anganwadi		52	Random from gov list (over 30 enrolled children)	Gov List: Letter of introduction from government
Children Selected and Invited	Age 2-5	1248	Random selection, by grade and gender	Schools: Letter of introduction from government
	Age 6-15	1820	Random selection, by grade and gender	Anganwadis: Letter of introduction from government
Children Participating	Age 2-5	1040	Those whose parents consent	Schools: Letter of introduction

			and children assent	from government
	Age 6-15	1560	Those whose parents consent and children assent	Anganwadis: Letter of introduction from government
Parents	Answering survey (2-5 children)	1040		Anganwadis: Letter of introduction from government

Protection of vulnerable populations: There are in effect two vulnerable populations.

1. Children (ages 2-15)

Those children participating in the survey will be protected via an extensive seeking of consent and permission from the community, school and parents. While remaining confidential in terms of respondent's answers, the community and teachers will be able to oversee the entire selection, explanation and surveying process. The population may be considered more vulnerable through being in a school setting where it may be difficult to say no to something a teacher requests. Protection will be afforded by very clear collection of assent, along with splitting the sample collection into two parts, where a list of children returning or not returning the sample will not be made available to teachers. Explanations will be made to children in English, Hindi and local language to assure that assent and understanding is complete.

2. Schools (who are under the authority of Ministry of Education)

These schools may not feel able to turn down participation for fear of penalty. This population will be protected by advance information being provided and the opportunity to discuss with the community but not having to give/decline consent direct to the government but to an independent survey team at a later date. It will be made clear to the schools by the survey team that withdrawing or declining will be at no penalty.

Compensation: Children and adults who participate in the survey will receive small compensation in the form of a packet of biscuits. This compensation will be provided to any study participant who arrives at the sample pick up point in the morning. The compensation will be provided even in the case that the child has not provided a sample, has chosen to withdraw or parental consent for participation has not been provided.

Informed Consent

Permission, assent and consent will be obtained at various levels in line with Rajasthan State Government Regulations.

This survey is carried out under the authority of the State Government of Rajasthan to inform their public health and education programme. As such the Ministry of Family Health and Welfare has provided a blanket consent for the participation of the population in this survey. (Draft Pending from Government)

Ahead of the survey (minimum 1 week) each school that has been selected for the survey will be provided with an information sheet (Appendix five) about the survey and requested to hold a community and parents meeting about it. They will be informed that written school consent for participation is required.

On the survey day, the survey team will arrive at the school. The survey team will repeat all the information and be available to answer any questions or concerns of the head teacher. The head teacher will complete a consent form on behalf of the school (Appendix 6) confirming participation or non participation.

School Age children will be selected and will be asked individually for verbal assent to participate in the survey.

Parents, community members and teachers will be present as registration for the survey and explanation of the sample collection takes place.

All School Age Children will be provided with a full information flyer, both written and pictorial (Appendix 7 draft, translation pending.) The flyer explains the purpose of the study, how to collect the sample, that participation is voluntary and withdrawal is without penalty, and who to contact for more information. The flyer states that should you not give permission for your child to participate simply do not return the sample and your child will be removed from the study completely without penalty. If children return to school with a sample the following day parental permission for participation will be assumed.

2 large posters with the same information are also placed in the community and in the school.

For Anganwadis, the same process of school consent will be undertaken. For children (aged 2-6) and selected for the survey a full explanation will be conducted for all children and parents together. Parents will all also be provided with the information flyer as above. At registration for the survey, parents will be asked for verbal consent, which will be recorded (as yes or no) by the survey administrator following informed consent information sheet being read (Appendix 8). Each parent will be asked to sign or mark the registration form by way of verifying their permission for their child and themselves to participate in the research (Appendix 1b).

Surveyors will be a combination of IPA staff and trained community volunteers and IPA will be paying for the surveyors.

Possible Risks of the study

Risks	
i. Research participants	<p>Medical Risk: None. This survey involves no drug administration, no ionising or radio-active substances, and no GM materials. Participants will come into contact with own stool specimen leading to potential contamination if any bacterial infections present. This risk is no different to real life, but will be mitigated by provision of sample collection kit to minimise contact and hand-washing station with soap for after sample collection.</p> <p>Emotional Risk: Those selected may suffer minor embarrassment. To mitigate this, children will be asked to collect samples at home and will be provided with coloured bags to disguise sample return. During questionnaires children will be interviewed by trained community volunteers in a confidential manner.</p> <p>There is very limited risk of stigmatisation due to infection with helminths. To mitigate any risk, schools and parents will only be informed of specific children infected where the programme will not treat in that area and these will be treated discreetly and in confidence. All data</p>

	collected will be made completely anonymous to all except the PI as soon as any required treatment has been administered. Although data on caste is held in school registers it will still be regarded as sensitive due to the nature of the caste system and along with all data held confidentially. Financial Risk: None
ii. Researchers	Medical Risk: Sample exposure, very limited biological risk of exposure to bacteria and other faecally transmitted diseases. This will be mitigated by basic laboratory procedures: gloves, soap, running water and training for sample handling and processing provided. Travel Risk: The survey team will be required to travel long distances in remote areas. Risk will be limited by providing high quality well serviced vehicles, with seatbelts and reputable drivers who will also be provided accommodation, meals etc. Travel at night or in the dark will be prohibited unless approved by senior management in cases of absolute necessity.
5.b Benefits	
i. Research participants	Medical: Should children be found to be individually infected with STH, but fall outside the government treatment area they will receive treatment for the infection.
ii. Researchers	Technicians recruited for this survey will be completing a short unique industrial placement as part of their final parasitology training.
iii. Others	All children in Rajasthan: Results will be used to advocate and target a state wide deworming programme helping to maximise children's health, development attendance, concentration and achievement in school. Out of school children will also benefit as encourage to attend deworming day.

Treatment of Data:

Personally identifying data is collected on a separate form and will be kept physically separate from parasitological and socio-economic data. Data will be collected on paper and will be stored securely in a locked room or vehicle when in the field. As soon as returning from the field hard copy data will be stored separately in locked cabinets. Only the PI will have access to the personally identifying data, for use only should children fall outside of the treatment area and infected children require treatment.

Electronically, data will be coded on entry and child name will not be recorded. Data will be stored in encrypted drives (true crypt) at all times, even on immediate entry in the field.

Any children who do not provide a sample or for whom parental permission is denied will not be included in the analysis.

Government of Rajasthan STH Survey For School Based Deworming Programme

SCHOOL CONSENT FORM

Complete both parts and stamp with school stamp: Survey team retains part One and School Retains Part Two

PART ONE

Head Teacher Name.....

School Name..... District.....

Please initial in the boxes to indicate:

- I have received the information sheet
- The information sheet has been explained to me
- My questions have been answered
- I understand I can withdraw my participation at any time

Please indicate your consent for the participation of your school and students in this STH survey.

I (insert name).....the headteacher

Consent Do Not Consent

for my school and students to participate in the STH survey for the School Based Deworming Programme as described on the information sheet provided to me.

DATE:.....

SIGNATURE HEAD TEACHER:.....

NAME DTWI PROGRAMME MANAGER:.....

SIGNATURE DTWI PROGRAMME MANAGER:.....

PART TWO

I (insert name).....the head teacher

Consent Do Not Consent

for my school and students to participate in the STH survey for the School Based Deworming Programme as described on the information sheet provided to me.

DATE:.....

SIGNATURE HEAD TEACHER:.....

NAME DTWI PROG. MNGR:.....

SIGNATURE DTWI PROG. MNGR.....

ANY QUESTIONS PLEASE CALL: (insert this info)

QUOTE the following SCHOOL ID:

Government of Rajasthan STH Survey For School Based Deworming Programme

ANGANWADI CONSENT FORM

Complete both parts: Survey team retains part One and Anganwadi Retains Part Two

PART ONE

Anganwadi Supervisor Name.....

Anganwadi Name..... District.....

Please initial in the boxes to indicate:

- I have received the information sheet
- The information sheet has been explained to me
- My questions have been answered
- I understand I can withdraw my participation at any time
- I understand that parental consent will be obtained in order for children to participate

Please indicate your consent for the participation of your anganwadi and students in this STH survey.

I (insert name).....the anganwadi supervisor

Consent Do Not Consent

for my anganwadi and students to participate in the STH survey for the School Based Deworming Programme as described on the information sheet provided to me.

DATE:.....

SIGNATURE ANGANWADI SUPERVISOR:.....

NAME DTWI PROGRAMME MANAGER:.....

SIGNATURE DTWI PROGRAMME MANAGER:.....

PART TWO

I (insert name).....the anganwadi supervisor

Consent Do Not Consent

for my anganwadi and students to participate in the STH survey for the School Based Deworming Programme as described on the information sheet provided to me.

DATE:.....

SIGNATURE ANGANWADI:.....

NAME DTWI PROG. MNGR:.....

SIGNATURE DTWI PROG. MNGR:.....

ANY QUESTIONS PLEASE CALL: (insert this info)

QUOTE the following ANGANWADI ID:

School ID:.....

Child ID:.....

Instructions to you will be in Italics.

Please ask questions as written providing more explanation as required in local language and with younger children. Use flash cards where directed. If unsure of coding or classification on any question record actual answer given by child.

At height and weight station confirm questionnaire ID with unique ID card and labelled survey items. Take height and weight of child (without shoes) according to survey protocols and record below. If questionnaire is filled retain it. If questionnaire unfilled send child to questionnaire station for completion.

WEIGHT:.....KGS

HEIGHT:.....CMS

At questionnaire station confirm questionnaire ID with unique ID and labelled survey items. Complete questionnaire with child. If height and weight is also completed retain questionnaire. If height and weight not recorded send child to next data collection point for measurement.

<p>1. How many brothers and sisters do you have? <i>Write the number in each space. If zero, write "0", do not leave blank.</i></p>	<p>___ brothers ___ sisters</p>		
<p>2. What type of house do you have? <i>Please circle one. Be prepared to explain to young children.</i></p>	Kuchcha	Semi-Pucca	Pucca
	Other	Don't Know	
<p>3a. Does your family own land? <i>Circle response and follow arrow</i></p>	<p>No → go to 3b Yes → go to 3c</p>		
<p>3b. If 3a No: Is your family local or migrated? <i>Circle response</i></p>	Local → go to 4		Migrant → go to 4
<p>3c. If 3a Yes: How much land does your family own? <i>Circle response</i></p>	<1 bigha	1-10 bigha	>10 bigha Other
<p>4. Select which of these items your father owns? <i>Lay out all the flash cards and ask children to select all the ones they have to one side. Confirm each selection with them as to what they think the picture is. Circle yes for each item the child selects. Confirm each non-selected item with them and circle no or don't know according to if child reports ownership by father.</i></p>			
Bicycle	Yes	No	Don't Know
Scooter / Motorcycle	Yes	No	Don't Know
Car / Jeep / Van	Yes	No	Don't Know
Electricity connection	Yes	No	Don't Know
Refrigerator	Yes	No	Don't Know
TV	Yes	No	Don't Know
Mobile phone	Yes	No	Don't Know
Landline phone	Yes	No	Don't Know
Radio	Yes	No	Don't Know
<p>5. What kind of fuel does your mother use to cook? <i>Circle all that apply</i></p>	Firewood	Cow dung	Kerosene
	Coal	LPG/(bio) gas	Other

6a. Do you have a latrine in your home? <i>Circle response follow arrow</i>		Yes → 6b		No → 7		Don't Know → 7	
6b. if 6a is Yes: Which type of latrine? Show the child provided flash cards of different latrines. Circle the picture number they select.		1 2 3 4					
7. This morning, where did you go to defecate? Use child age appropriate term for defecate and encourage them not to be shy. There is no right/correct answer.		Latrine		Outside		Other	
8a. This morning, what was available to immediately cleanse your hand after defecating? <i>Use child age appropriate term for defecation. Circle response (all that apply) and specify for other if needed.</i>		Nothing → go to 9	Ash	Soap	Water	Soil	Other
8b. Which one did you use? <i>Circle all that apply</i>		None	Ash	Soap	Water	Soil	Other
9. What do you use most to cleanse your hands? <i>Circle one answer</i>		Ash		Water		Soil	Other
10. Can your mother read your school textbook? <i>Circle answer</i>				Yes	No		No Answer
11. What level STD did your mother pass?		Lower Primary (class 1-5)	Upper Primary (class 6-8)	Secondary (class 9-10)		Higher Secondary (class 11-12) and above	
		Diploma	Don't Know	No Mother		Other _____	
12. What job does the chief wage earner in your household do? For younger children you should to explain what the chief wage earner is. If more than one occupation, ask about main job. Classify the occupation into one of the categories to the right. Write the occupation on the dotted lines that correlates to the category. For example: Petty trader: <u>Sells street food</u>		Labourer..... Skilled worker..... Farmer..... Petty trader..... Shop owner..... Service Person..... Don't know..... Other.....					
13. Where do you get water for drinking?		Tapped water in house		Tapped water outside house		Hand pump	
		River/lake water		Well		Other	
14. How does your family process your water?		With nothing		Boiled		Filtered in muslin/cloth	
		Added with alum		Other		Don't Know	
15. By Observation: What shoes are you wearing now? Check the child's feet as they are standing there and circle the observation you make.		Barefoot → Go to 16	Chappals → Survey complete	Closed shoe → Survey complete		Sandals/ open shoes	
16a. If 15 barefoot: Did you wear anything on your feet to come to school today?				Yes → 16b		No → survey complete	
16b. What did you wear? <i>Request children to collect shoes and bring them to you, record according to observation</i>				Chappals → Survey complete	Closed shoe → survey complete	Sandals/ open shoes → survey complete	

School Registration Form

SCHOOL ID
0 _ _ _

GPS COORDINATES
X _ _ . _ _ _ _ _ _ Y _ _ . _ _ _ _ _ _

School Name.....	Date: / /
School Address.....	District.....
.....	Block.....
.....	Village.....
Other Notes:	

ID No.	Name	Sex	Age	Class	Religion	Caste
001						
002						
003						
004						
005						
006						
007						
008						
009						
010						
011						
012						
013						
014						

Information on School Health Facilities: School ID <u>0</u> <u> </u> <u> </u> School <u> </u>	
<i>Instructions to you will be in Italics: Answer questions by speaking with teachers, confirm all by direct observation</i>	
1a. Do you have a community latrine in this village? <i>Please check yes or no.</i>	<input type="checkbox"/> Yes → 1b <input type="checkbox"/> No → 2
1b. If yes, how many latrines are available for general community use? <i>Please write in #.</i>	_____
2. Previous Deworming Information (<i>as much detail as possible</i>):	
Program: _____ Date (month/year.): <u> </u> / <u> </u> / <u> </u> Name of drug used _____	
3. Total Enrollment in School	Girls _____ Boys _____
5. Number of latrines: <i>Please fill in the # of each type, include ALL latrines functioning or not. Sum the total at the bottom.</i>	For Student Boys _____ For Student Girls _____ For Student Unisex _____ For Teachers _____ Total Latrines (<i>sum all the above</i>) _____
6. Number of latrines with the following characteristics: <i>Please fill in the # that fit each characteristic. Note that each sub-group (eg. 6a) should add to the total # of latrines above.</i>	6a. Locked _____ Not locked _____
	6b. Water _____ No water _____
	6c. Serviceable _____ Not serviceable _____
	6d. Appear in use _____ Do not appear in use _____
	6e. Without attached hand-washing site _____ Attached hand-washing site no water _____ Attached hand-washing site with just water _____ Attached hand-washing site with water and soap _____
	6f. Earth floor around latrine _____ Concrete floor around latrine _____ Ceramic/Tiled around latrine _____
7. Water supply to school <i>Check all that apply to indicate facilities and functionality.</i>	<input type="checkbox"/> Mains tapped water <input type="checkbox"/> Manual well <input type="checkbox"/> Hand pump <input type="checkbox"/> Rainwater tanks <input type="checkbox"/> Collected from local source <input type="checkbox"/> No water at school <input type="checkbox"/> Hand pump is locked <input type="checkbox"/> Well is locked <input type="checkbox"/> Tap is dry <input type="checkbox"/> Well is dry <input type="checkbox"/> Rainwater tank empty
8a. Are there hand washing sites <i>Please check yes or no.</i>	<input type="checkbox"/> Yes → 8b <input type="checkbox"/> No → 9
8b. How many sites with each of the following: <i>Please write in numbers of each.</i>	Water only _____ Water + Soap _____ No Water, No Soap _____
9. Is there a hygiene poster visible in the school?	<input type="checkbox"/> Yes <input type="checkbox"/> No

Registration Cont.: School ID 0 School Date / /

ID No.	Name	Sex	Age	Class	Religion	Caste
015						
016						
017						
018						
019						
020						
021						
022						
023						
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039						
040						

**Anganwadi
Registration Form**

ANGANWADI ID

GPS COORDINATES
X|_|_|.|_|_|_|_|_|_| Y|_|_|.|_|_|_|_|_|_|

Anganwadi Name & Address..... Corresponding School Name	Date: / / District..... Block..... Village.....
Other Notes:	

Parent Name	Consent	Parent Signature	ID No.	Name	Sex	Age (mo.)	Religion	Caste
	Y / N		050					
	Y / N		051					
	Y / N		052					
	Y / N		053					
	Y / N		054					
	Y / N		055					
	Y / N		056					
	Y / N		057					
	Y / N		058					
	Y / N		059					

Info on Anganwadi Health Facilities: Anganwadi ID _____ School _____									
<i>Instructions to you will be in Italics: Answer questions by speaking with teachers, confirm all by direct observation</i>									
1a. Do you have a community latrine in this village? <i>Please check yes or no.</i>	<input type="checkbox"/> Yes → 1b <input type="checkbox"/> No → 2								
1b. If yes, how many latrines are available for general community use? <i>Please write in #.</i>	_____								
2. Previous Deworming Information (<i>as much detail as possible</i>):									
Program: _____ Date (month/year.): __ / ____ Name of drug used _____									
3. How many staff work at this anganwadi?	_____								
4. What is the educational level of the supervisor of this anganwadi? <i>Please tick the correct box.</i>	<input type="checkbox"/> None <input type="checkbox"/> Class 1-5 <input type="checkbox"/> Class 6-8 <input type="checkbox"/> Class 9-10 <input type="checkbox"/> Class 11-12 <input type="checkbox"/> Diploma <input type="checkbox"/> No Answer								
5. Number of latrines: <i>Please fill in the # of each type, include ALL latrines functioning or not. Sum the total at the bottom.</i>	<table border="1"> <tr> <td>For Student Boys _____</td> <td rowspan="4">Total Latrines (Sum all to left) _____</td> </tr> <tr> <td>For Student Girls _____</td> </tr> <tr> <td>For Student Unisex _____</td> </tr> <tr> <td>For Teachers _____</td> </tr> </table>	For Student Boys _____	Total Latrines (Sum all to left) _____	For Student Girls _____	For Student Unisex _____	For Teachers _____			
For Student Boys _____	Total Latrines (Sum all to left) _____								
For Student Girls _____									
For Student Unisex _____									
For Teachers _____									
6. Number of latrines with the following characteristics: <i>Please fill in the # that fit each characteristic. Note that each sub-group (eg. 6a) should add to the total # of latrines above.</i>	<table border="1"> <tr> <td>6a. Locked _____ Not locked _____</td> <td>6b. Water _____ No water _____</td> </tr> <tr> <td>6c. Serviceable _____ Not serviceable _____</td> <td>6d. Appear in use _____ Do not appear in use _____</td> </tr> <tr> <td colspan="2">6e. No attached hand-washing site _____ Attached hand-washing site no water _____ Attached hand-washing site with just water _____ Attached hand-washing site with water and soap _____</td> </tr> <tr> <td colspan="2">6f. Earth floor around latrine _____ Concrete floor around latrine _____ Ceramic/Tiled around latrine _____</td> </tr> </table>	6a. Locked _____ Not locked _____	6b. Water _____ No water _____	6c. Serviceable _____ Not serviceable _____	6d. Appear in use _____ Do not appear in use _____	6e. No attached hand-washing site _____ Attached hand-washing site no water _____ Attached hand-washing site with just water _____ Attached hand-washing site with water and soap _____		6f. Earth floor around latrine _____ Concrete floor around latrine _____ Ceramic/Tiled around latrine _____	
6a. Locked _____ Not locked _____	6b. Water _____ No water _____								
6c. Serviceable _____ Not serviceable _____	6d. Appear in use _____ Do not appear in use _____								
6e. No attached hand-washing site _____ Attached hand-washing site no water _____ Attached hand-washing site with just water _____ Attached hand-washing site with water and soap _____									
6f. Earth floor around latrine _____ Concrete floor around latrine _____ Ceramic/Tiled around latrine _____									
7. Water supply to school <i>Check all that apply to indicate facilities and functionality.</i>	<input type="checkbox"/> Mains tapped water <input type="checkbox"/> Manual well <input type="checkbox"/> Hand pump <input type="checkbox"/> Rainwater tanks <input type="checkbox"/> Collected from local source <input type="checkbox"/> No water at school <input type="checkbox"/> Hand pump is locked <input type="checkbox"/> Well is locked <input type="checkbox"/> Tap is dry <input type="checkbox"/> Well is dry <input type="checkbox"/> Rainwater tank empty								
8a. Are there hand washing sites <i>Please check yes or no.</i>	<input type="checkbox"/> Yes → 8b <input type="checkbox"/> No → 9								
8b. How many sites with each of the following: <i>Please write in numbers of each.</i>	Water only _____ Water + Soap _____ No Water, No Soap _____								
9. Is there a hygiene poster visible in the school?	<input type="checkbox"/> Yes <input type="checkbox"/> No								

Tracking: Anganwadi ID _____

Corresponding School _____

Date __ / __ / ____

Parent Name	Consent	Parent Signature	ID No.	Name	Sex	Age (mo.)	Religion	Caste
	Y / N		060					
	Y / N		061					
	Y / N		062					
	Y / N		063					
	Y / N		064					
	Y / N		065					
	Y / N		066					
	Y / N		067					
	Y / N		068					
	Y / N		069					
	Y / N		070					
	Y / N		071					
	Y / N		072					
	Y / N		073					
	Y / N		074					
	Y / N		075					

PARASITOLOGY REPORTING FORM: SCHOOL SLIDES 001 - 020

SCHOOL ID.....

NAME OF PARASITOLOGIST.....

INDICATE BY CIRCLING : **A slides** or **B slides**

***Instructions:** Process slides in order 001 -020. Complete form immediately when slide is read. Should a slide be missing confirm with slide maker. If slide maker confirms no sample draw a line through the row and write “no sample” in notes. If there are no eggs in sample write a “0”. DO NOT LEAVE BLANK. If slide not readable request a new slide, if sample too small or stool not readable draw a line through the row and note the reason.*

ID	COUNT EGGS OF EACH STH SPECIES			Other (name)	Other (name)	Notes
	HK	AS	TR			
001						
002						
003						
004						
005						
006						
007						
008						
009						
010						
011						
012						
013						
014						
015						
016						
017						
018						
019						
020						

PARASITOLOGY REPORTING FORM: SCHOOL SLIDES 021 - 040

SCHOOL ID.....

NAME OF PARASITOLOGIST.....

INDICATE BY CIRCLING : **A slides** or **B slides**

***Instructions:** Process slides in order 021 -040. Complete form immediately when slide is read. Should a slide be missing confirm with slide maker. If slide maker confirms no sample draw a line through the row and write "no sample" in notes. If there are no eggs in sample write a "0". DO NOT LEAVE BLANK. If slide not readable request a new slide, if sample too small or stool not readable draw a line through the row and note the reason.*

ID	COUNT EGGS OF EACH STH SPECIES			Other (name)	Other (name)	Notes
	HK	AS	TR			
021						
022						
023						
024						
025						
026						
027						
028						
029						
030						
031						
032						
033						
034						
035						
036						
037						
038						
039						
040						

PARASITOLOGY REPORTING FORM: ANW SLIDES 050 - 065

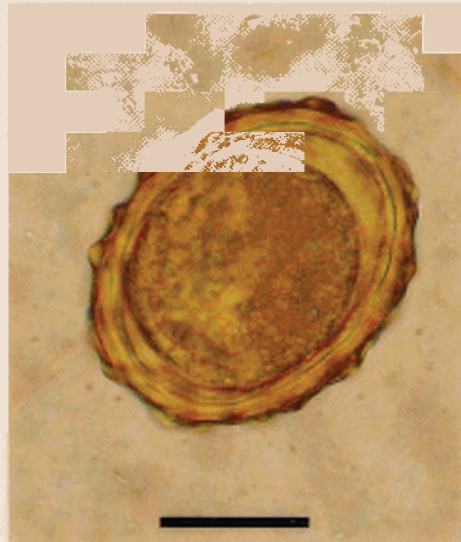
SCHOOL ID.....

NAME OF PARASITOLOGIST.....

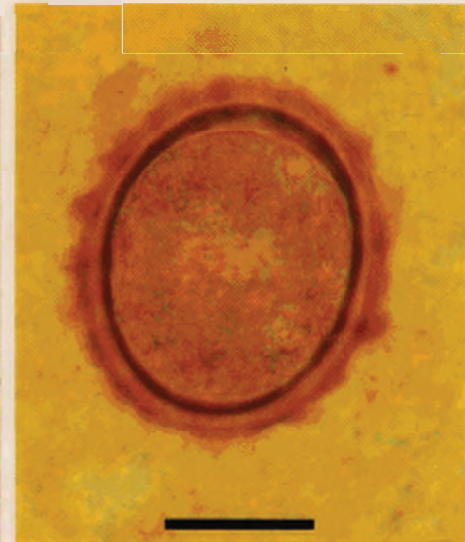
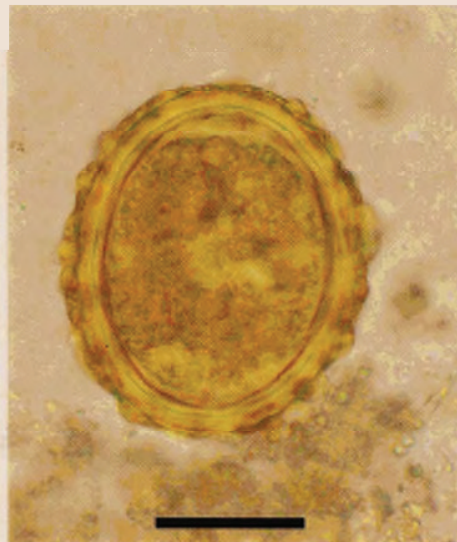
INDICATE BY CIRCLING : **A slides** or **B slides**

***Instructions:** Process slides in order 050 -065. Complete form immediately when slide is read. Should a slide be missing confirm with slide maker. If slide maker confirms no sample draw a line through the row and write "no sample" in notes. If there are no eggs in sample write a "0". DO NOT LEAVE BLANK. If slide not readable request a new slide, if sample too small or stool not readable draw a line through the row and note the reason.*

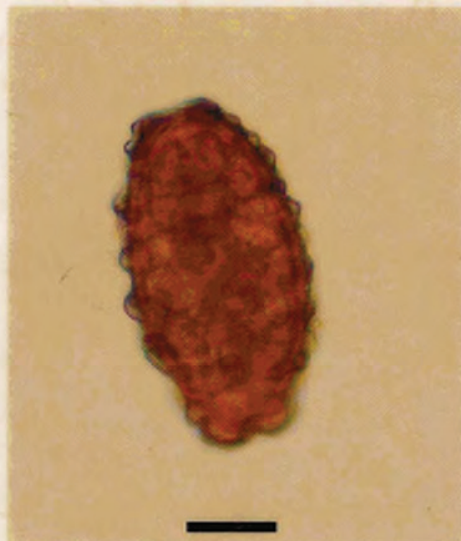
ID	COUNT EGGS OF EACH STH SPECIES			Other (name)	Other (name)	Notes
	HK	AS	TR			
050						
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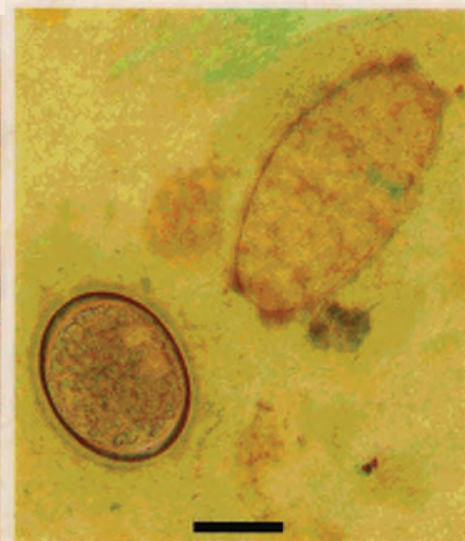
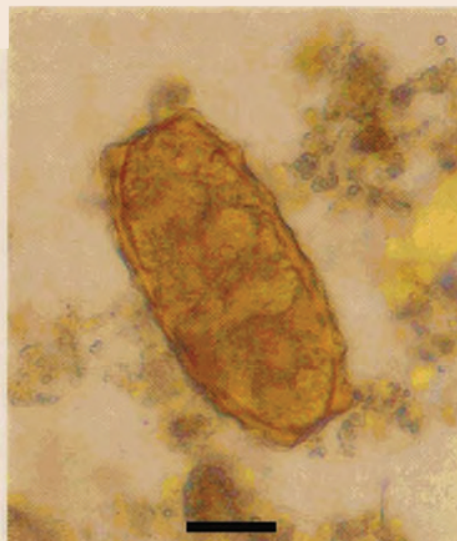
Normal fertile *Ascaris lumbricoides* eggs measure 65–75 µm by 35–50 µm, are golden yellow to brown in colour and are in the single cell stage when passed in the faeces. The egg has conspicuous mammillations on its surface.



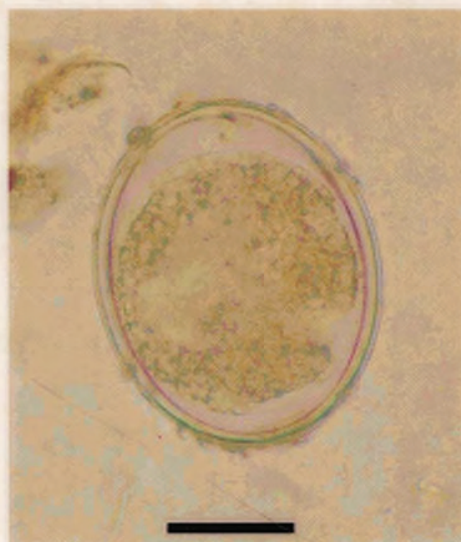
Typical fertile *Ascaris* egg as it appears in a Kato-Katz preparation.



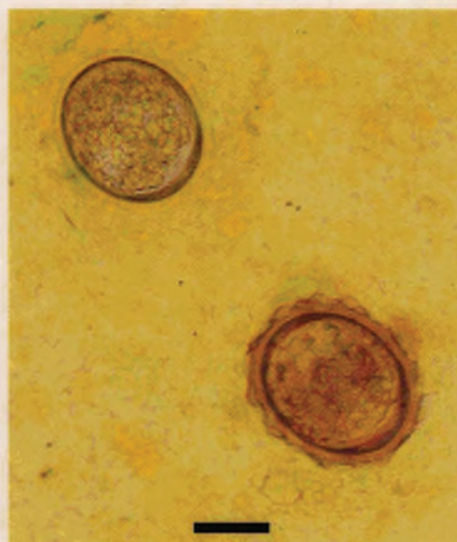
Typical infertile *Ascaris* eggs in faeces. These eggs are elongated and much larger in size (85–95 by 43–47 µm), have thin shells and a grossly irregular mammillated layer. The content of the egg is usually granular and lacks any organization.



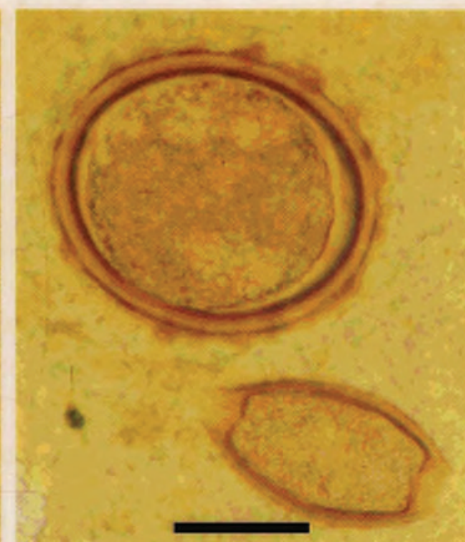
Fertile (lower left) and infertile *Ascaris* eggs in a Kato-Katz preparation.



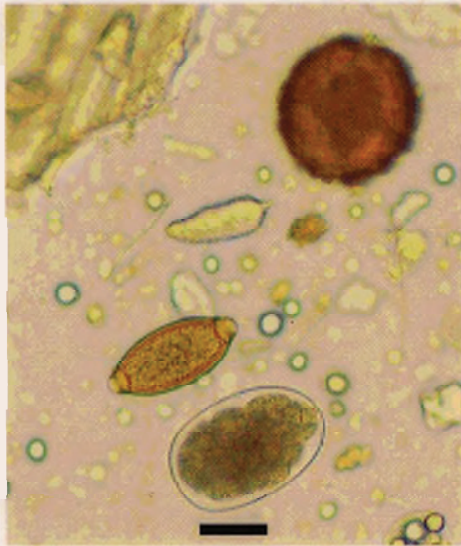
Ascaris. Sometimes, normal fertile eggs lack the mammillated layer and are referred to as "decorticated" eggs.



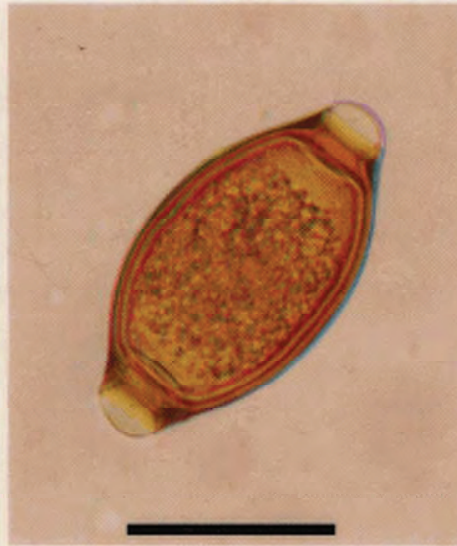
Ascaris. Normal and decorticated egg (upper left) in a Kato-Katz preparation.



Ascaris (upper) and *Trichuris* (lower) eggs in a Kato-Katz preparation.



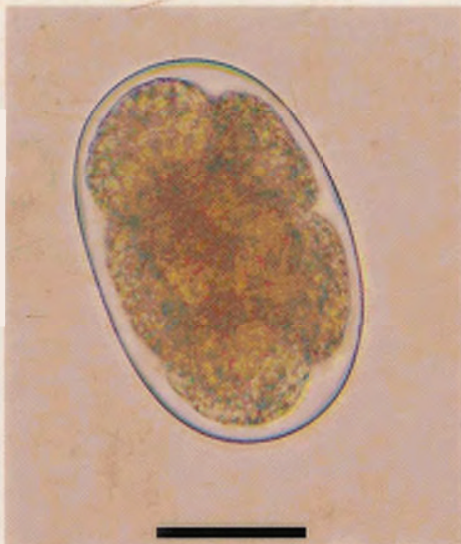
Ascaris (upper), *Trichuris* (middle) and hookworm (lower) eggs in the same microscopic field, illustrating their relative sizes.



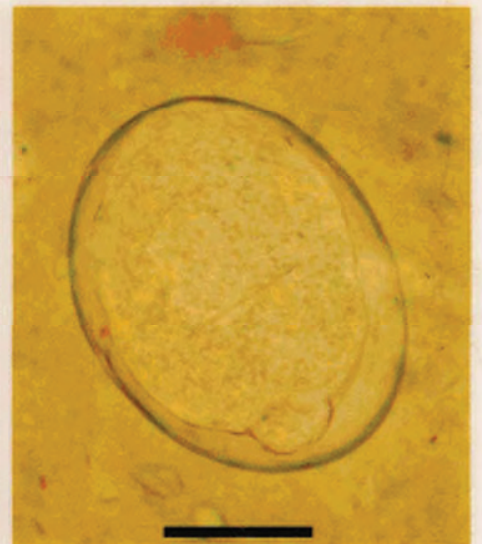
Typical *Trichuris* eggs measure 50–55 µm by 22–24 µm, have a brown, smooth shell, bipolar prominences (plugs) and contain a single-cell ovum.



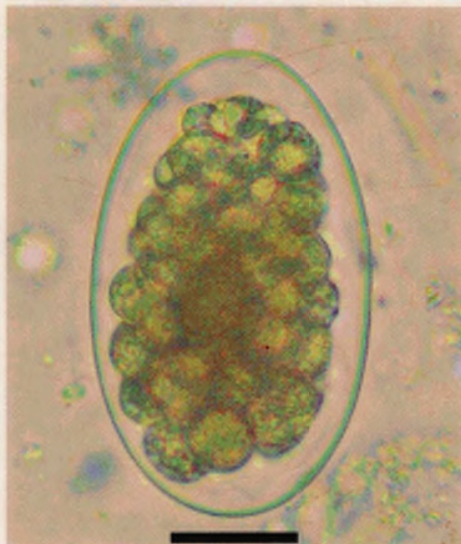
In a Kato-Katz preparation, *Trichuris* eggs may appear larger and swollen with degenerated contents. The bipolar prominences and the layers of the shell are not sharply defined.



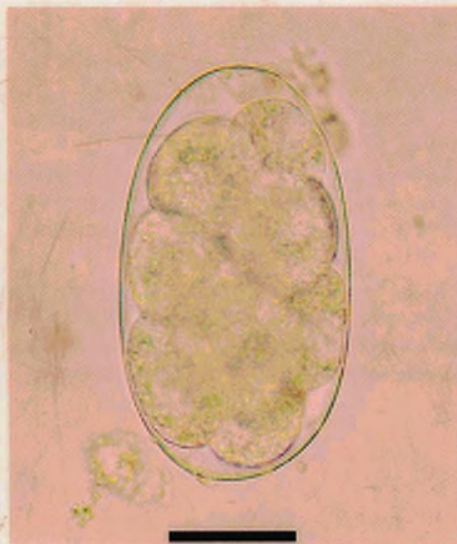
Hookworm eggs found in faeces are characteristically barrel-shaped with a thin, hyaline shell; they measure 60–75 µm by 36–40 µm. They are usually in the 4- or 8-cell stage in fresh faeces or in a more advanced stage of cleavage in faeces that have been kept at room temperature for over a few hours.



Hookworm eggs in Kato-Katz preparations are often almost round and the dividing ovum is increasingly difficult to see. In hot climates the glycerol will overclear the egg and then invisible 30–60 minutes after preparation.



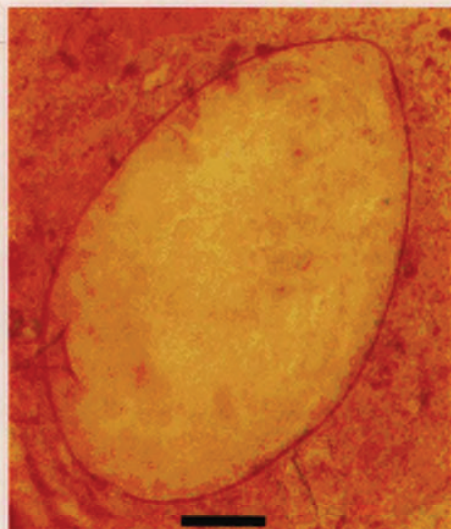
Trichostrongyle eggs resemble hookworm eggs but are larger (75–95 µm by 40–50 µm) and more elongated in shape. The ovum is in an advanced stage of cleavage when passed in faeces.



Ternidens diminutus is another strongyle parasite which infects humans, mostly in southern Africa. The egg resembles the hookworm egg and measures about 85x50 µm. It tends to be in an advanced stage of cleavage when passed in the faeces.

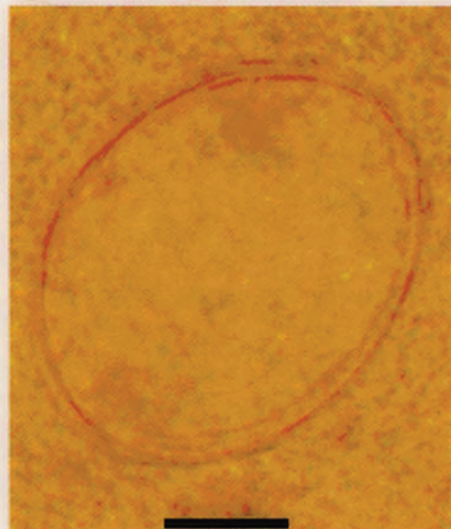
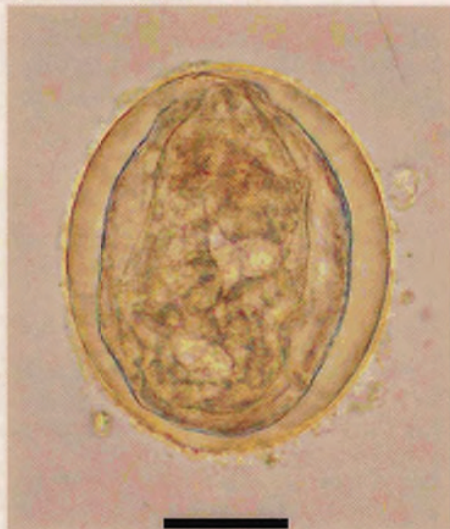
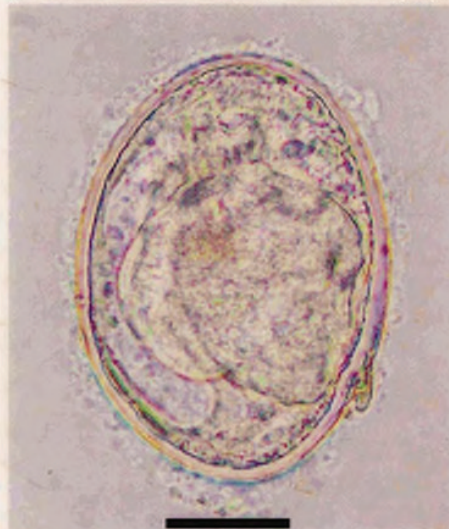


Strongyloides stercoralis infection is routinely diagnosed by the presence in faeces of first-stage rhabditoid larvae of 180–380 µm by 14–20 µm. Larvae have a short buccal capsule, an attenuated tail and a prominent genital primordium (arrow).



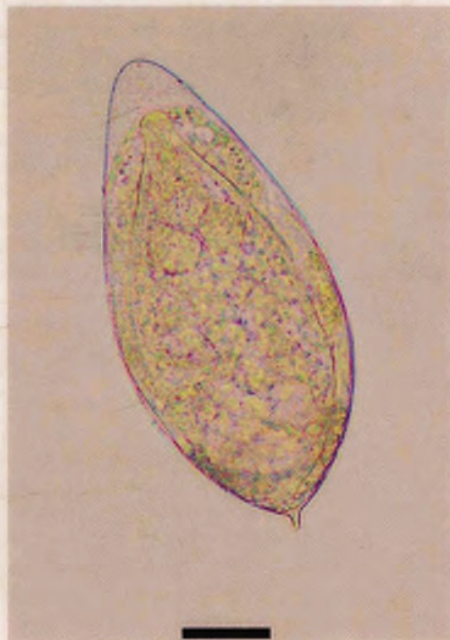
Schistosoma mansoni eggs are large, measuring 114–175 µm by 45–70 µm, have a thin, transparent shell and a prominent lateral spine, and contain a miracidium. If the spine is hidden from view, gently tapping the coverslip may expose it.

S. mansoni in Kato-Katz preparations are easily identified on the basis of size, shape and presence of the lateral spine.



Schistosoma japonicum eggs are smaller than those of ***S. mansoni*** and ***S. haematobium***. They measure 70–100 µm by 55–65 µm and tend to be round to oval in shape, have a thin shell and a small, inconspicuous, lateral spine. The eggs contain a miracidium. Frequently, faecal debris adherent to the egg surface or orientation may obscure the spine.

In Kato-Katz preparations, the spine of the egg of ***S. japonicum*** is rarely seen and the miracidium quickly becomes inapparent. Size and thin shell help identify the species.



The eggs of ***S. haematobium*** have a terminal spine and contain a miracidium. They measure 112–170 µm by 50–70 µm. These eggs are usually found in the urine but occasionally they may also be found in faeces.

The eggs of ***Schistosoma intercalatum*** are usually larger than those of ***S. haematobium***, measure about 140–240 µm, are typically found in faeces and have an equatorial bulge.



Kato-Katz technique – cellophane faecal thick smear

Materials and reagents

1. Applicator sticks, wooden.
2. Screen, stainless steel, nylon or plastic: 60–105 mesh (Fig. 1).
3. Template, stainless steel, plastic, or cardboard (Fig. 1). Templates of different sizes have been produced in different countries. A hole of 9 mm on a 1 mm thick template will deliver 50 mg of faeces; a hole of 6 mm on a 1.5 mm thick template, 41.7 mg; and a hole of 6.5 mm on a 0.5 mm thick template, 20 mg. The templates should be standardized in the country and the same size of templates should always be used to ensure repeatability and comparability of prevalence and intensity data.
4. Spatula, plastic (Fig. 1).
5. Microscope slides (75 x 25 mm).
6. Hydrophilic cellophane, 40–50 µm thick, strips 25 x 30 or 25 x 35 mm in size (Fig. 2).
7. Flat-bottom jar with lid (Fig. 2).
8. Forceps.
9. Toilet paper or absorbent tissue.
10. Newspaper.
11. Glycerol–malachite green or glycerol–methylene blue solution (1 ml of 3% aqueous malachite green or 3% methylene blue is added to 100 ml of glycerol and 100 ml of distilled water and mixed well). This solution is poured onto the cellophane strips in a jar and left for at least 24 h prior to use.

procedure

1. Place a small mound of faecal material on newspaper or scrap paper and press the small screen on top so that some of the faeces are sieved through the screen and accumulate on top (Fig. 3).
2. Scrape the flat-sided spatula across the upper surface of the screen to collect the sieved faeces (Fig. 4).
3. Place template with hole on the centre of a microscope slide and add faeces from the spatula so that the hole is completely filled (Fig. 5). Using the side of the spatula pass over the template to remove excess faeces from the edge of the hole (the spatula and screen may be discarded or, if carefully washed, may be reused).
4. Remove the template carefully so that the cylinder of faeces is left on the slide.
5. Cover the faecal material with the pre-soaked cellophane strip (Fig. 6). The strip must be very wet if the faeces are dry and less so if the faeces are soft (if excess glycerol solution is present an upper surface of cellophane wipe with toilet paper). In dry climates excess glycerol will retard but not prevent drying.
6. Invert the microscope slide and firmly press the faecal sample against the hydrophilic cellophane strip on another microscope slide or on a smooth hard surface such as a piece of tile or a flat stone. The faecal material will be spread evenly between the microscope slide and the cellophane strip (Fig. 7). It should be possible to read newspaper print through the smear after clarification (Fig. 8).
7. Carefully remove slide by gently sliding it sideways to avoid separating the cellophane strip or lifting it off. Place the slide on the bench with the cellophane upwards. Water evaporates while glycerol clears the faeces.
8. For all except hookworm eggs, keep slide for one or more hours at ambient temperature to clear the faecal material prior to examination under the microscope. To speed up clearing and examination, the slide can be placed in a 40 °C incubator or kept in direct sunlight for several minutes.
9. *Ascaris* and *Trichuris* eggs will remain visible and recognizable for many months in these preparations. Hookworm eggs clear rapidly and will no longer be visible after 30–60 minutes. Schistosome eggs may be recognizable for up to several months but it is preferable in a schistosomiasis endemic area to examine the slide preparations within 24 hours.
10. The smear should be examined in a systematic manner (see Plate 1, Fig. 4) and the number of eggs of each species reported. Later multiply by the appropriate number to give the number of eggs per gram of faeces (by 20 if using a 50 mg template; by 50 for a 20 mg template; and by 24 for a 41.7 mg template). With high egg counts, to maintain a rigorous approach while reducing reading time, the Stoll quantitative dilution technique with 0.1 mol/litre NaOH may be recommended (see *Basic laboratory methods in medical parasitology*, WHO, 1991).

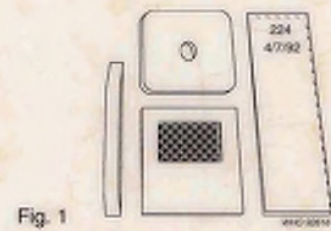


Fig. 1

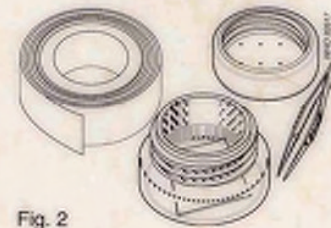


Fig. 2



Fig. 3

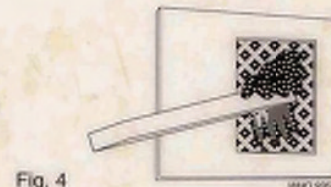


Fig. 4



Fig. 5



Fig. 6



Fig. 7



Fig. 8

Sample Survey for Estimating the Burden of Intestinal Worm Infestation in Rajasthan

Training Material for Community Volunteers

Sponsored by:

**Department of Medical Health & Family Welfare
Rajasthan Council of Elementary Education
Department of Secondary Education
Department of Women and Child Development
UNICEF, Rajasthan
Deworm The World**

Table of Contents

The Deworming Programme-----	3
Frequently Asked Questions-----	5
Role of the Community Volunteers-----	7
Survey Methodology: School Procedure-----	8
• Registration-----	9
○ Preparation Work-----	9
○ Working the Registration Table-----	10
○ Giving the SEQ-----	12
○ Measuring Height & Weight -----	15
○ Explanation of Sample to Children-----	16
• Sample Collection-----	17
○ Set Up-----	17
○ Receiving Sample & Checking Data Integrity-----	17
Annex	
1. List of Schools and Codings-----	19
2. ID Protocol-----	21
3. Equipment list-----	23
4. SEQ-----	24
5. School Registration Form-----	26
6. Anganwadi Registration Form-----	29

The Deworming Programme



Why a large-scale deworming programme for school-age children?

Over 400 million school-age children worldwide are infected with parasitic worms including soil transmitted helminths and Schistosomiasis. India is estimated to have a high burden soil transmitted helminths, including hookworm, roundworm and whipworm. Children, on account of their behaviour – often barefoot, poor hand hygiene etc. – carry the greatest burden of worm infections in populations. These worms pose a threat to their physical and mental development and impact on their education both short and long term.

Why conduct a prevalence study before a deworming programme?

An accurate estimation of the prevalence of worm infestation is important to decide on the areas where a mass school-based deworming programme should be implemented. It also guides the programme managers to decide if the treatment should be administered every six months, every year or every two years (as stipulated in the WHO guidelines, based on percentage of estimated infections). Lastly the survey acts as a baseline allowing monitoring of the programme for impact.

Commitment of the top leadership for deworming

In pursuit of Education for All and the Millennium Development Goals, governments, UN agencies, the World Bank, and civil society organisations have made deworming an education policy priority. Deworming is increasingly recognised as one of the best buys to support progress towards universal primary education and to improve children's long-term productivity.

In Rajasthan, the Department of Medical Health & Family Welfare, Rajasthan Council of Elementary Education, the Department of Secondary Education, and the Department of Women and Child Development are together leading the proposed mass school-based deworming programme. There is commitment of senior leadership across these ministries/departments to assess the need for mass school-based deworming, and ensure its successful implementation, if such a need is established.

Rationale for implementing a mass school-based deworming programme

In general, school-age children have the highest worm load amongst all age groups, and therefore suffer the maximum adverse effects on account of these worms. These worms harm their health, nutrition and development, and threaten their access to education and learning.

At a programme cost of less than INR 25 per child per year, the model of mass school-based deworming in areas of high prevalence has been found to be the most cost-effective intervention, amongst all such interventions rigorously evaluated, to improve access to education. Mass school-based deworming has been proven to reduce school absenteeism by as much as 25%. In addition, research has shown that children persistently infected with worms are 13% less likely to be literate and earn 43% less as adults.



Treatment for intestinal worm infestation

There are many drugs available for different kinds of worms. For STHs, Albendazole/Mebendazole is generally the drug of choice. Treatment is inexpensive, easy and safe. Depending on the estimated prevalence of infections, mass treatment by region takes place once every six months, one year or two years.

Success of school-based deworming programmes

To date, Deworm the World (DtW) has supported government-led sustainable, mass school-based deworming programmes covering approximately 37 million school-age children across 27 countries. In India, the programme has been successfully implemented in Andhra Pradesh in 2009, in Bihar in 2011, and in Delhi in 2012. The programme reached 2 million children in Andhra Pradesh, reached 17 million in Bihar, and targeted 3.6 million in Delhi (final outcomes pending).

In all of these regions, the work described is Phase 1 of a campaign which is ongoing. State governments are committed to furthering the program and covering additional districts in subsequent phases. DtW is also in discussions with various other state governments in India to assess the need for, and expand the mass school-based deworming programme in regions of high prevalence.

Frequently Asked Questions:

Here are some questions that you might encounter while doing the surveys. We have provided some guideline answers for you to work with. More detailed descriptions of Deworm the World and this program are found in the next section, The Deworming Programme.

1. Who is Deworm the World and Innovations for Poverty Action?

Deworm the World is an organization that improves the health and education of school-age children by expanding school-based deworming programs. Deworm the World works with governments in countries around the world. Innovations for Poverty Action is a nonprofit dedicated to discovering what works to help the world's poor. They design and evaluate programs and are currently providing technical assistance to Deworm the World. On this programme Deworm the World is working with the state government on their programme.

2. Why deworm?

400 million school-age children worldwide are infected with parasitic worms. Worms harm child health and development, limit their participation in school, and decrease their earnings as adults. For less than INR 25 per child per year, deworming in schools can immediately rid large numbers of children of these worms.

3. Why do you need to test for worms?

An accurate estimation of the prevalence of worm infestation is important to decide on the areas where a mass school-based deworming programme should be implemented. It also guides the programme managers to decide if the treatment should be administered every six months, every year or every two years. Lastly the survey acts as a baseline that allows us to better monitor programme impact.

4. What will you do with the sample?

The sample will be sent to the laboratory in order to determine the worm burden of each child. Analyzing this information will allow us to determine where and with what frequency we should treat children in Rajasthan.

5. If my child / any children from the school has really high worms, would you let us know and give the medication?

Following the survey, the Educational Department will send a letter to your community's school informing them of the overall worm burden of the school. They will also send a list of infected children, and you will be notified of your child's status if he or she is infected. All children will be treated on Deworming Day on October 15th. In almost all cases, waiting until October for treatment will not be detrimental to your child's health. In case you would like to treat your child beforehand, Albendazole can be bought at a local primary health center.

6. Why is deworming only for school children?

It isn't – Deworming Day is open to all children in each community, regardless of whether or not they are enrolled in school. We encourage all children ages 2-16 years old to attend.

7. Why aren't you testing the older children?

Older children are much more shy and tend not to bring back the samples. Additionally the most at risk children are 2-14 years. The prevalence in 2-14 can be used to estimate the

prevalence in older children. Even though they are not part of this survey, older children will still be able to access deworming day and we would encourage them to attend.

8. Why aren't you testing my child?

The children were randomly selected. This provides the highest quality and most reliable answers. Because this is a survey only, we do not need to test every child. The children we do test will give us a representative information regarding worm burden in each community. Despite not being selected all children are encouraged to attend deworming day.

9. Are the drugs safe?

Yes, deworming drugs are very safe. The ones in the programme are the World Health Organisation recommended drug. They are from an international gold standard supplier and approved by the government. Treatment is inexpensive, easy and safe.

10. When will treatment happen?

Treatment will happen on Deworming Day, October 15, this year, 2012. Treatment is being led by the Government on a mass scale and therefore will happen at a later date.

11. When will we see results?

The results of the survey will be given to each school individually within a few weeks of the survey. As all children will get deworming medication through the programme a list of infected children will not be provided so as to protect their privacy.

12. Do I have to do the survey?

No, the survey is completely optional, and there is no penalty for not doing it. The Campaign will treat all children for worms. If your child does not participate they will still be eligible for treatment.

13. What will I get if I do it?

If you choose to complete the survey, you will get a packet of biscuits as compensation for your participation and for your time.

14. How long will the survey take?

Registration on the first day will take about 1-2 hours. Sample Collection the next morning will take around 20 minutes.

15. Why are you collecting socio-economic data?

This data will allow us to look at how socio-economic status is related to the prevalence of worms. This will allow us to better predict where worm burden will be, and make our program more effective.

16. Who will have access to the socio-economic data of my family?

Data will be immediately anonymized. Your data will be there, but identifying features will be removed, so there will be no way to connect you to that information.

Role of the Community Volunteers

The community volunteers are an essential part of the Deworm the World team. They help to communicate essential information to the community, and assist with all aspects of Registration and Sample Collection (described in depth below).

This section outlines the particular responsibilities of Community Volunteers. These include:

- The Community Volunteer is in charge of setting up and conducting meetings to provide information to the community about our Survey and the Deworming Programme prior to our arrival. This will happen in different settings depending on the institution: in schools, this will be a parent-teacher meeting, and in anganwadis, this will be a community meeting. It is the responsibility of the Community Volunteer to ensure this meeting occurs.
- The Community Volunteer should also ensure that the worms poster is displayed in the school prior to our visit.
- During our visit to the school, Community Volunteers should help to ensure that parents, children, and teachers fully understand the survey and its purpose. Use local languages and expressions in your explanations to try to help everyone become comfortable with the process.
- After our departure, Community Volunteers should also work to promote deworming day in the community. They should spread information about the Programme and its intended timing (October 15th).
- Finally, the role includes assisting the survey team with Registration and Sample Collection, described in depth in the Procedure Section below.

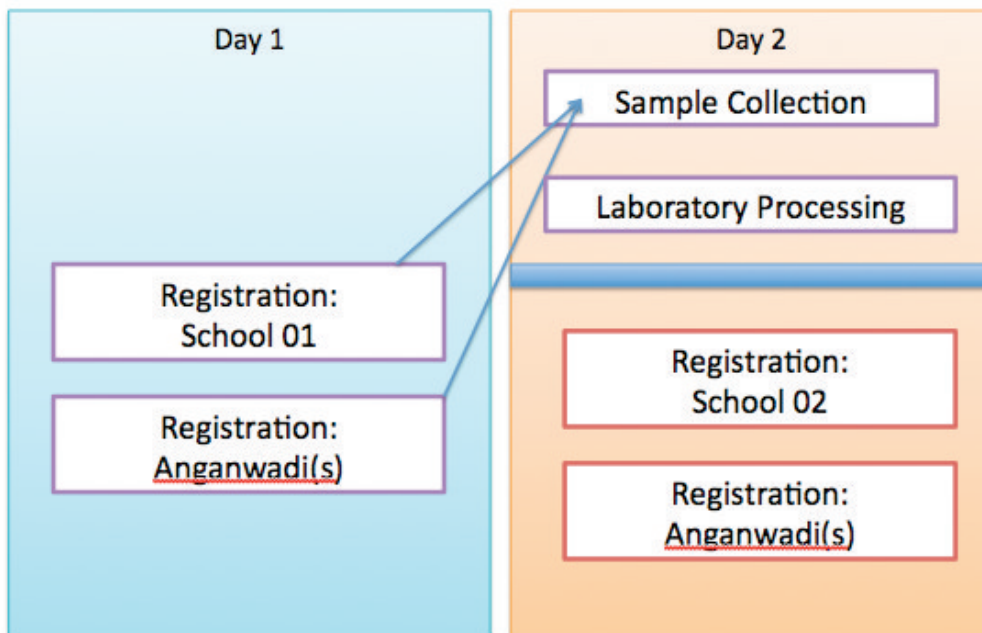
Survey Procedure

As a Community Volunteer, you may be asked to help with all aspects of Registration and Sample Collection. You will not be asked to contribute to Laboratory Processing.

The below image is presented here to help you to understand the timings of the procedure. Each school will be visited twice, for registration and for sample collection. Registration typically occurs in the afternoon, and sample pick up always takes place the morning following registration.

During the registration of each school, one or several anganwadis will also be visited in the vicinity of that school. The team will visit as many as is necessary to register 25 children under 5 years of age. The parents of participating anganwadi children will be asked to drop off their sample at the school the following morning.

After all samples have been collected, they are sent to the laboratory for processing and the cycle of work begins again. A typical timeline looks as follows:



The Registration and Sample Collection components will now be described in detail.

Registration

Preparation Work:

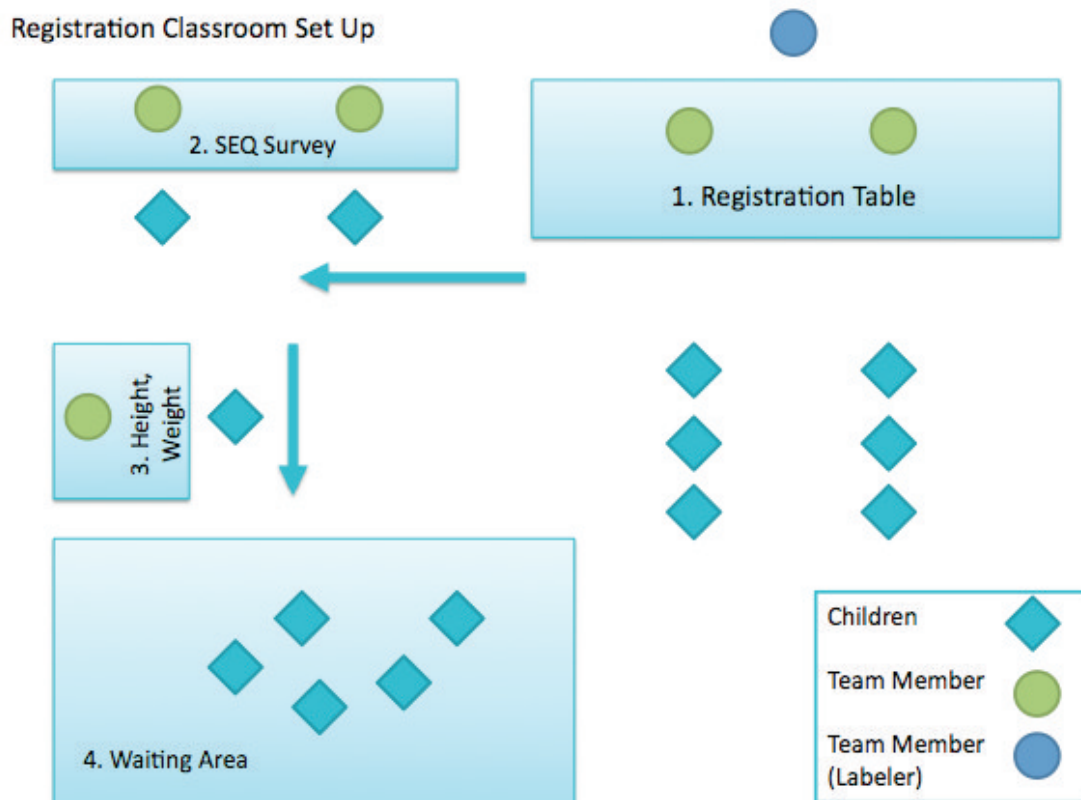
Prior to beginning the Registration process at a school, the team should ensure that certain preparations have been made the night before. The school should be called the day prior to the visit to confirm our arrival. The “school kit,” or collection of materials that must be put together for each school, must also be in order. This includes:

- Inserting the School ID number on the registration form and all socio-economic questionnaires with the school ID number. Additionally, the filling in of school name, address district, block, and village on the school registration form.
- The preparation of all polyester bags that will be given to the children. This includes placing inside each bag a newspaper slip, info flyer, spoon
- Counting of sufficient sample collection pots
- Labelling of sufficient child ID cards
- Consulting map and agreeing departure time and assigned team
- Packing of all equipment required into vehicles. Ensure you have everything on the equipment list here:



Preparation of school kit

Upon arriving at the school, one Deworm the World team member will go to speak to the head teacher to ask for a classroom for the use of the team. The entire team will help to set up the room so that it looks as follows:



Working the Registration Table

There will be three people present at the Registration Table: two filling out the registration forms, and one in charge of labelling and handing out materials. The procedure for each role is described below.

1. Registration Form

The Registration Form for Schools looks as follows:

School Registration Form

GPS COORDINATES	
X.....	Y.....

School Name.....	School ID : <u> 0 </u> <u> </u> <u> </u>	Date: / /
School Address.....	District.....	Block.....
	Village.....	
Other Notes:		

ID No.	Name	Sex	Age	Class	Caste	Religion
001						
002						
003						
004						

The top section for school information should have School Name, School Address, and School ID filled out prior to arriving at the school. Complete the remaining fields in the top section. For now, you can ignore the GPS coordinate box as well as the School Health Facilities section at the very end of the form (these will be explained in Step #8).

The main section for registration (grey heading) has 40 rows total, extending up to child ID # 040 and covering two sheets. The two people filling the Registration form should each take one sheet. The person with the second sheet should ensure fields at the very top School ID, school name, and date have been filled and complete if necessary.

Tracking: School ID 0 School _____ Date / /

ID No.	Name	Sex	Age	Class	Caste	Religion
--------	------	-----	-----	-------	-------	----------

Children who enter the classroom should immediately line up at the registration table in a two-filed line, one in front of each team member. Record their information.

Caste should not be directly asked of any student, but rather copied down directly from the school’s class register. Ask a teacher to assist you with this if necessary. Use the following table to determine categories:

Abbreviation	Caste	Sub-class
GEN	General	
SCH	Scheduled	
ST	Scheduled Tribal	
OBC	Other Backward Castes	
	Muslim	

2. Labelling / Materials

As the child's name is filled in, note their 3 digit child ID No (to the left of their names on the registration form). Give them an ID card with the corresponding number. Label their bag, and SEQ with this 3 digit number using black permanent marker. Label the top of the sample pot with the number and the label with the school ID, 3 digit child ID and their first name in Hindi. Hand the bag to the child after ensuring that it contains the following items:

- sample pot (labelled)
- SEQ (labelled)
- ID card
- info flyer
- piece of newspaper
- Spatula/spoon

Direct the child to either the height/weight or SEQ station (whichever has a shorter queue).



Example of a Registration Table

Giving the SEQ

The SEQ station should be set up as shown, with an orderly queue. Effort should be made to maintain as much privacy as possible for the child answering the questionnaire by requesting the others to wait a few feet back.



When child arrives for questionnaire confirm that the questionnaire Child ID on the top of the SEQ form matches their unique ID card and the labels on their bag and pot. If the Child IDs do not match, the issue should be resolved immediately by returning to the registration table and assessing what has happened.

The SEQ is copied below. Follow the survey instructions to complete the questionnaire with the child. Much of this information is quite personal so be aware children may feel shy and encourage them to be honest and the feel relaxed, they are not in trouble. With small children be prepared to assist with explanations and give them time. They may also have an older sibling in the school who can help with some of the questions.

<p>1. How many brothers and sisters do you have? <i>Write the number in each space. If zero, write "0", do not leave blank.</i></p>	<p>___ brothers ___ sisters</p>		
<p>2. What type of house do you have? <i>Please circle one. Be prepared to explain to young children.</i></p>	Kuchcha	Semi-Pucca	Pucca
	Other	Don't Know	
<p>3a. Does your family own land? <i>Circle response and follow arrow</i></p>	No → go to 3b		Yes → go to 3c
<p>3b. If 3a No: Is your family local or migrated? <i>Circle response</i></p>	Local		Migrant
	< 1 bigha	1-10 bigha	>10 bigha Other
<p>3c. If 3a Yes: How much land does your family own? <i>Circle response</i></p>			
<p>4. Select which of these items your father owns? <i>Lay out all the flash cards and ask children to select all the ones they have to one side. Confirm each selection with them as to what they think the picture is. Circle yes for each item the child selects. Confirm each non-selected item with them and circle no or don't know according to if child reports ownership by father.</i></p>			
Bicycle	Yes	No	Don't Know
Scooter / Motorcycle	Yes	No	Don't Know
Car / Jeep / Van	Yes	No	Don't Know
Electricity connection	Yes	No	Don't Know
Refrigerator	Yes	No	Don't Know

	TV	Yes	No	Don't Know		
	Mobile phone	Yes	No	Don't Know		
	Landline phone	Yes	No	Don't Know		
	Radio	Yes	No	Don't Know		
5. What kind of fuel does your mother use to cook? <i>Circle all that apply</i>	Firewood	Cow dung	Kerosene			
	Coal	LPG/(bio) gas	Other			
6a. Do you have a latrine in your home? <i>Circle response follow arrow</i> 6b. if 6a is Yes: Which type of latrine? <i>Show the child provided flash cards of different latrines. Circle the picture number they select.</i>	Yes → 6b 1 2 3 4	No → 7	Don't Know → 7			
7. This morning, where did you go to defecate? <i>Use child age appropriate term for defecate and encourage them not to be shy. There is no right/correct answer.</i>	Latrine	Outside	Other	No Answer		
8a. This morning, what was available to immediately cleanse your hand after defecating? <i>Use child age appropriate term for defecation. Circle response (all that apply) and specify for other if needed.</i> 8b. Which one did you use? <i>Circle all that apply</i>	Nothing → go to 9	Ash	Soap	Water	Soil	Other
	Ash	Soap	Water	Soil	Other	
9. What do you use most to cleanse your hands? <i>Circle one answer</i>	Ash	Water	Soil	Other		
10. Can your mother read your textbook? <i>Circle answer</i>	Yes	No	No Answer			
11. What level STD did your mother pass?	None	Less than STD 6	Finish STD 6	Attended Secondary School		
	Has a Diploma	Don't Know	No Mother	Other _____		
12. What job does the chief wage earner in your household do? <i>For younger children you should to explain what the chief wage earner is. If more than one occupation, ask about main job. Classify the occupation into one of the categories to the right. Write the occupation on the dotted lines that correlates to the category. For example:</i> Petty trader: <u>Sells street food</u>	Laborer..... Skilled worker..... Farmer..... Petty trader..... Shop owner..... Service Person..... Don't know..... Other.....					
13. Where do you get water for drinking?	Tapped water in house	Tapped water outside house	Hand pump			

	River/lake water	Well	Other	
14. How does your family process your water?	With nothing	Boiled	Filtered in muslin/cloth	
	Added with alum	Other	Don't Know	
15. By Observation: What shoes are you wearing now? <i>Check the child's feet as they are standing there and circle the observation you make.</i>	Barefoot → Go to 16	Chappals → Survey complete	Closed shoe → Survey complete	Sandals/ open shoes
16a. If 15 barefoot: Did you wear anything on your feet to come to school today?	Yes → 16b	No → survey complete		
	16b. What did you wear? <i>Request children to collect shoes and bring them to you, record according to observation</i>	Chappals → Survey complete	Closed shoe → survey complete	Sandals/ open shoes → survey complete

For Questions #4 and #6, use flashcards as directed. For Question #15, physically check the child's shoes as shown in the second picture above.

After completing the SEQ, if height and weight is also completed retain questionnaire. If height and weight not recorded send child to height / weight station for measurement.

Measuring Height & Weight

When child arrives for height and weight confirm questionnaire ID with unique ID card and labelled survey items.

To take Height:

All children should be able to take their height standing. Ensure that measurement on the wall is prepared carefully. Check that shoes, socks and hair ornaments (if they would interfere with measurement) have been removed. Follow these steps:

1. Help the child stand against the wall with feet slightly apart. The back of the head, shoulder blades, buttocks, calves, and heels should all touch the vertical board or wall. If necessary, push gently on the tummy to help the child stand to full height
2. Ask the child to position his or her head so that their eyes stare straight ahead. Help them to tilt their head correctly if necessary.



3. Place a clipboard or other flat instrument so that it rests firmly on top of the head and compresses the hair.
4. Read the measurement and record the child's height in centimetres to the last completed 0.1 cm.

To take Weight:

Check that shoes have been removed before weighing each child. Be sure that the scale is placed on a flat, hard surface. Follow these steps:

1. To turn on the scale. When the number 0.0 appears, the scale is ready.
2. Ask the child to stand in the middle of the scale, feet slightly apart, and to remain still until the weight appears on the display.
3. Record the child's weight to the nearest 0.1 kg.

Height and weight should be written on the SEQ questionnaire on the space provided:

WEIGHT:.....KGS

HEIGHT:.....CMS

After taking both height and weight, if questionnaire is filled retain it. If questionnaire is unfilled send child to SEQ station for completion.

Explanation of Sample to Children

Once all children have completed their form and are gathered, explain to them the steps that they will need to take in order to prepare and return a stool sample. This explanation should be done in the local language using appropriate terminology and include the representative from the PTA/SMC if possible. Include the following:

- Review why we are taking samples and the overall idea of the pro gramme
- Get children's buy in and consent to participate by a show of hands.
- Explain to children the importance of the ID. Get them to hold up each item in the bag to ensure they have it and to confirm the number on each thing.
- Ask them to show their parents the flyer in their bag when they return home, and request that their parents read it
- If their parent agrees for them to participate, ask them to do the following:



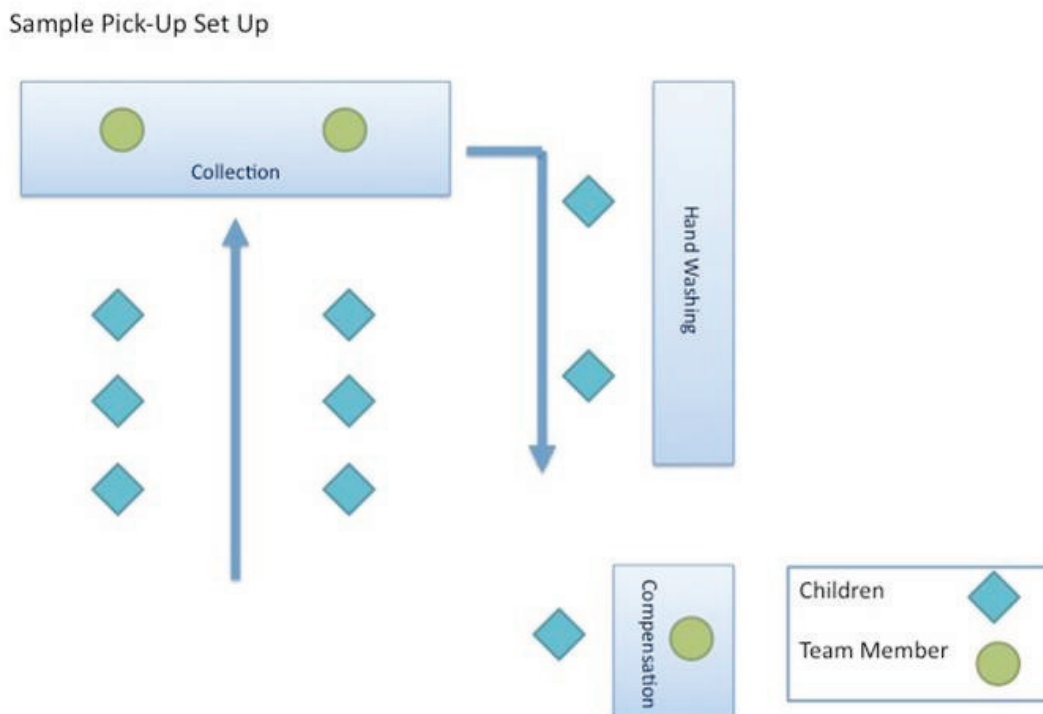
1. Defecate on the newspaper (not on the ground)
 2. Using the spoon provided, fill the pot provided halfway with stool.
 3. Close the pot thoroughly and place it in the bag. Wash their hands afterwards.
 4. Bring the bag with the pot and sample inside to school the next morning at the time agreed on by the school and team. They should also bring the ID card inside their bag. Tell the child that they will receive a packet of biscuits as a thank you for participating.
- Ask children to repeat instructions back to you in some way to ensure that they understand. You can even get one child to tell all the others.
 - Agree a time with teachers and all students to return samples in the morning. Suggest 7 am or earlier
 - Thank the children for their time. Make sure everyone has their bags as they exit.

Sample Collection

Sample Collection will occur at all schools on the morning after Registration, at the time agreed upon the previous day.

Set Up

The team should arrive on site at the school the morning after registration in time to set up before the allocated collection time. This is usually around 7 am. Set up should resemble the following image:



Prior to the sample collection the team should have established any errors or missing data in what was collected the previous day and should travel to the school with the equipment necessary to correct it. The equipment list in the packs details exactly what a team needs with them.

Receiving Sample & Checking Data Integrity

As children arrive, they should be directed into two lines to the collection table, where team members will receive their samples. At this point the team members should:

- Ensure that the ID card in the child's bag matches the child ID labelled on their pot.
- Ask the child's name and ensure that the name and sample match on the registration form
- Check each container to ensure that it holds a sample.

If there is no sample: Have a teacher or trusted person explain the procedure again to the child and ask them to try again. If the child still returns with no sample they should still get the compensation.

If there is a sample mix up check if they are returning a sample on behalf of anyone else. If they are, ensure the sample is from that person and check that name against the register. If the numbers still do not match, accept the sample and provide the compensation. Set the sample aside and mark a cross on the top of the lid to denote that it should not be processed when the laboratory is reached.

At this point, any problems in prior data collection should also be resolved. For instance, if a SEQ is missing, the team should complete a new questionnaire with that child. If a question of an incorrect ID on a questionnaire exists the questionnaire should be re-done. This should be done by someone other than the team members at the table, once the child with the flagged ID has been identified at the collection point.

After the child submits their sample, direct them to the hand-washing station. From there, they will proceed to receive a small compensation gift.

1. List of Schools and Codings

Code	District
11	BARMER
12	BIKANER
13	CHURU
14	DAUSA
15	DHAULPUR
16	DUNGARPUR
17	JAIPUR
18	KOTA
19	NAGPUR
20	RAJSAMAND
21	SAWAI MADHOPUR
22	SIROHI
23	TONK

District	School ID	School Name
11	001	GPS KOPANADA
11	002	GPS NILSAR
11	003	GPS DEHWA
11	004	SKP VAGTANI BHABHUO KA SARA
12	005	G.P.S. AAWA
12	006	G.P.S. INDRA COLONY, GAJNER
12	007	G.P.S., DELANA BADA
12	008	G.S.S., DHARNOK
13	009	G SEC.SCHOOL DHANI KANDHARAN
13	010	GPS RAJASAR PANWANRAN
13	011	G.SEC.SCHOOL GHANTIYAL BADI
13	012	GSS DHIRVAS CHHOTTA
14	013	GOVT. SS PANDITPURA
14	014	GOVT. PS DAVESTHAN JHOOPDIYA
14	015	GOVT. SS TUDIYANA
14	016	GOVT. UPS JHURAWATON KI DHANI
15	017	GOVT P.S. DURGASI
15	018	GOVT.U.P.S. BOTHPURA
15	019	GOVT U.P.S. BAHADARPUR
15	020	GOVT.P.S. MATHGUSAIN
16	021	G.P.S.KARMAT
16	022	G.P.S. GHANTI PHALA II
16	023	G.P.S. KALARIYA
16	024	G.P.S.NAKA TALAIE
17	025	GOVT PS BURIYO KE DANI
17	026	GOVT PS BEGUS
17	027	GOVT SEC. MOHHABATPURA
17	028	GOVT UPS MANOHARIA WALA
18	029	G.U.P.S. NIMODA

18	030	G.P.S. KAITHON I
18	031	G.P.S. SKS RAIL AWAD
18	032	G.P.S. UMADPURA
19	033	GHSS JOHRI LADNUN
19	034	GPS KALWA BARA
19	035	GUPS TADO KI DHANI
19	036	GPS RATHORI KUWA
20	037	GOVT.SS. DOWADA
20	038	GOVT. PS SHIKSHAKARMI, KUNVATHAL
20	039	GOVT. PS, SOI KI BHAGAL
20	040	GOVT.PS, BALWAS
21	041	G. U.P S SARAY
21	042	G. P.S. DEWATA
21	043	G. P.S. MAHANANDPUR
21	044	G. U.P.S. MAHARO
22	045	G.P.S., AMBBA
22	046	PS_RAMPURA
22	047	G.U.P.S., VASADA
22	048	UPS_ROVARA
23	049	GOVT. SKS BAD GOUR KHURD
23	050	GOVT. PS NAGORIYAN
23	051	GOVT. UPS NATHADI
23	052	GOVT. PS MEENO KA TAPARA DEOLI

2. ID Protocol

Each child will be uniquely identified by an ID that also captures which district and school or anganwadi they come from. The ID system will look as follows:

___ ___ - ___ ___ ___ - ___ ___ ___
district school/angan. child

(There will be no dashes in the actual ID, these were added for clarity).

The coding of each of the three parts of this ID are explained here:

District: These 2 digit IDs will run from 11 – 23, and describe the 13 different districts visited.

School / Anganwadi: This ID divides into two parts.

The second and third digits indicated : __ x x will be the school ID. This will be assigned beforehand to the final list of schools visited, and range from 01 – 52.

The first digit will indicate whether the ID refers to the school itself, or an anganwadi corresponding to that school's location. It is possible that multiple anganwadis could be visited that each correspond to the same school, in order to procure enough samples. Therefore this first digit will code as follows:

- 0 = school itself
- 1 = first anganwadi visited near the school
- 2 = second anganwadi visited near the school
- 3 = third anganwadi visited near the school

Child: The child ID will be taken from each registration form. It will range from 001 – 040 for school children, and from 050 – 075 for anganwadi children.

Procedure:

Throughout the surveying, it will be most important to keep good track of each child's school/anganwadi 3 digit ID and child 3 digit ID. Below describes how IDs will be tracked as a child moves through the registration process.

1. Registration form will be pre-filled with that school/anganwadi ID prior to arriving at that school.
2. When children register, their names will be written next to a 001-075 ID. They will be given:
 - a. An ID card with that 3-digit child ID on it. They will keep this until they complete the process.
 - b. A bag labelled with their 3 digit child ID containing sample collection kit and flyer
 - c. A pot labelled with the school/ anganwadi ID *and* their 3 digit child ID.

- d. A socio-economic survey, labelled with their 3 digit child ID, as well as with the 3 digit school ID. [All school IDs should be filled in on the socio survey ahead of visiting the school].
3. The child will proceed either to the height/weight station or to the socio-economic questionnaire station. At either place, they will give the person at that station their socio-economic survey. Before proceeding, this team member should check to ensure that the child's ID card matches the ID shown on their socio-economic survey and the IDs shown on their bag and on their pot.
4. The height / weight and socio-economic information will then be completed, and the team member that finishes the form will retain it. No child should leave the room until everyone is finished. When all forms are complete, the children will be gathered for an explanation of the samples. During this, the DTW team will count all questionnaires and put them in order to ensure none are missing. If some are, requests will be made for them. (In the case that we still don't have a questionnaire the next day, a new one will be filled out when the child brings the sample.)

Equipment List for 1 School and up to 3 surrounding Anganwadis

For Registration:

Registration form (1xschool, 3xanganwadi)
Copy of informational letter to school (x2)
Blank School Consent form (x1)
Blank Anganwadi Consent form (x1)
Random sample table (x1 for school x2 for anganwadi)
Flyers (x 60)
Socio-Economic Questionnaires (x60)
Latrine Flashcards (x2 sets)
Asset Flashcards (x2 sets)
Poster (x2 for school)
School checklist (x1 per school x3 per anganwadi)
Spare form set (with technical manager)

Black markers
Pens and pencils
Masking tape
Rubbish bag (x4)
Pots (x60)
Spoons (x60)
Newspaper squares (x60)
Small non-see through bags (x60)

Digital Scales (1 set)
Height Board (1)

For Sample Collection:

Completed Registration forms marked with errors for correction
Pens and pencils
Completed SEQ forms, for reference (problems flagged)
Spare form set
Soap and antiseptic for washing
Jerry can of water
Clean towel
Gloves
Compensation gift (60 + 5 spare)
Black bin liners (2)
Cool box

Digital Scales (1 set)
Height board (1)

School ID:.....

Child ID:.....

Instructions to you will be in Italics.

Please ask questions as written providing more explanation as required in local language and with younger children. Use flash cards where directed. If unsure of coding or classification on any question record actual answer given by child.

At height and weight station confirm questionnaire ID with unique ID card and labelled survey items. Take height and weight of child (without shoes) according to survey protocols and record below. If questionnaire is filled retain it. If questionnaire unfilled send child to questionnaire station for completion.

WEIGHT:.....KGS

HEIGHT:.....CMS

At questionnaire station confirm questionnaire ID with unique ID and labelled survey items. Complete questionnaire with child. If height and weight is also completed retain questionnaire. If height and weight not recorded send child to next data collection point for measurement.

<p>1. How many brothers and sisters do you have? <i>Write the number in each space. If zero, write "0", do not leave blank.</i></p>	<p>___ brothers ___ sisters</p>		
<p>2. What type of house do you have? <i>Please circle one. Be prepared to explain to young children.</i></p>	Kuchcha	Semi-Pucca	Pucca
	Other	Don't Know	
<p>3a. Does your family own land? <i>Circle response and follow arrow</i></p>	<p>No → go to 3b Yes → go to 3c</p>		
<p>3b. If 3a No: Is your family local or migrated? <i>Circle response</i></p>	<p>Local → go to 4</p>		<p>Migrant → go to 4</p>
<p>3c. If 3a Yes: How much land does your family own? <i>Circle response</i></p>	<1 bigha	1-10 bigha	>10 bigha Other
<p>4. Select which of these items your father owns? <i>Lay out all the flash cards and ask children to select all the ones they have to one side. Confirm each selection with them as to what they think the picture is. Circle yes for each item the child selects. Confirm each non-selected item with them and circle no or don't know according to if child reports ownership by father.</i></p>			
Bicycle	Yes	No	Don't Know
Scooter / Motorcycle	Yes	No	Don't Know
Car / Jeep / Van	Yes	No	Don't Know
Electricity connection	Yes	No	Don't Know
Refrigerator	Yes	No	Don't Know
TV	Yes	No	Don't Know
Mobile phone	Yes	No	Don't Know
Landline phone	Yes	No	Don't Know
Radio	Yes	No	Don't Know
<p>5. What kind of fuel does your mother use to cook? <i>Circle all that apply</i></p>	Firewood	Cow dung	Kerosene
	Coal	LPG/(bio) gas	Other

6a. Do you have a latrine in your home? <i>Circle response follow arrow</i>		Yes → 6b		No → 7		Don't Know → 7	
6b. if 6a is Yes: Which type of latrine? Show the child provided flash cards of different latrines. Circle the picture number they select.		1 2 3 4					
7. This morning, where did you go to defecate? Use child age appropriate term for defecate and encourage them not to be shy. There is no right/correct answer.		Latrine		Outside		Other	
8a. This morning, what was available to immediately cleanse your hand after defecating? <i>Use child age appropriate term for defecation. Circle response (all that apply) and specify for other if needed.</i>		Nothing → go to 9	Ash	Soap	Water	Soil	Other
8b. Which one did you use? <i>Circle all that apply</i>		None	Ash	Soap	Water	Soil	Other
9. What do you use most to cleanse your hands? <i>Circle one answer</i>		Ash		Water		Soil	Other
10. Can your mother read your school textbook? <i>Circle answer</i>				Yes	No		No Answer
11. What level STD did your mother pass?		Lower Primary (class 1-5)	Upper Primary (class 6-8)	Secondary (class 9-10)		Higher Secondary (class 11-12) and above	
		Diploma	Don't Know	No Mother		Other _____	
12. What job does the chief wage earner in your household do? For younger children you should to explain what the chief wage earner is. If more than one occupation, ask about main job. Classify the occupation into one of the categories to the right. Write the occupation on the dotted lines that correlates to the category. For example: Petty trader: <u>Sells street food</u>		Labourer..... Skilled worker..... Farmer..... Petty trader..... Shop owner..... Service Person..... Don't know..... Other.....					
13. Where do you get water for drinking?		Tapped water in house		Tapped water outside house		Hand pump	
		River/lake water		Well		Other	
14. How does your family process your water?		With nothing		Boiled		Filtered in muslin/cloth	
		Added with alum		Other		Don't Know	
15. By Observation: What shoes are you wearing now? Check the child's feet as they are standing there and circle the observation you make.		Barefoot → Go to 16	Chappals → Survey complete		Closed shoe → Survey complete		Sandals/ open shoes
16a. If 15 barefoot: Did you wear anything on your feet to come to school today?				Yes → 16b		No → survey complete	
16b. What did you wear? <i>Request children to collect shoes and bring them to you, record according to observation</i>				Chappals → Survey complete		Closed shoe → survey complete	
						Sandals/ open shoes → survey complete	

School Registration Form

SCHOOL ID
0 _ _ _

GPS COORDINATES
X _ _ . _ _ _ _ _ _ Y _ _ . _ _ _ _ _ _

School Name.....	Date: / /
School Address.....	District.....
.....	Block.....
.....	Village.....
Other Notes:	

ID No.	Name	Sex	Age	Class	Religion	Caste
001						
002						
003						
004						
005						
006						
007						
008						
009						
010						
011						
012						
013						
014						

Information on School Health Facilities: School ID <u>0</u> <u> </u> <u> </u> School <u> </u>	
<i>Instructions to you will be in Italics: Answer questions by speaking with teachers, confirm all by direct observation</i>	
1a. Do you have a community latrine in this village? <i>Please check yes or no.</i>	<input type="checkbox"/> Yes → 1b <input type="checkbox"/> No → 2
1b. If yes, how many latrines are available for general community use? <i>Please write in #.</i>	_____
2. Previous Deworming Information (<i>as much detail as possible</i>):	
Program: _____ Date (month/year.): <u> </u> / <u> </u> / <u> </u> Name of drug used _____	
3. Total Enrollment in School	Girls _____ Boys _____
5. Number of latrines: <i>Please fill in the # of each type, include ALL latrines functioning or not. Sum the total at the bottom.</i>	For Student Boys _____ For Student Girls _____ For Student Unisex _____ For Teachers _____ Total Latrines (<i>sum all the above</i>) _____
6. Number of latrines with the following characteristics: <i>Please fill in the # that fit each characteristic. Note that each sub-group (eg. 6a) should add to the total # of latrines above.</i>	6a. Locked _____ Not locked _____
	6b. Water _____ No water _____
	6c. Serviceable _____ Not serviceable _____
	6d. Appear in use _____ Do not appear in use _____
	6e. Without attached hand-washing site _____ Attached hand-washing site no water _____ Attached hand-washing site with just water _____ Attached hand-washing site with water and soap _____
	6f. Earth floor around latrine _____ Concrete floor around latrine _____ Ceramic/Tiled around latrine _____
7. Water supply to school <i>Check all that apply to indicate facilities and functionality.</i>	<input type="checkbox"/> Mains tapped water <input type="checkbox"/> Manual well <input type="checkbox"/> Hand pump <input type="checkbox"/> Rainwater tanks <input type="checkbox"/> Collected from local source <input type="checkbox"/> No water at school <input type="checkbox"/> Hand pump is locked <input type="checkbox"/> Well is locked <input type="checkbox"/> Tap is dry <input type="checkbox"/> Well is dry <input type="checkbox"/> Rainwater tank empty
8a. Are there hand washing sites <i>Please check yes or no.</i>	<input type="checkbox"/> Yes → 8b <input type="checkbox"/> No → 9
8b. How many sites with each of the following: <i>Please write in numbers of each.</i>	Water only _____ Water + Soap _____ No Water, No Soap _____
9. Is there a hygiene poster visible in the school?	<input type="checkbox"/> Yes <input type="checkbox"/> No

**Anganwadi
Registration Form**

ANGANWADI ID

GPS COORDINATES
X|_|_|.|_|_|_|_|_|_| Y|_|_|.|_|_|_|_|_|_|

Anganwadi Name & Address..... Corresponding School Name	Date: / / District..... Block..... Village.....
Other Notes:	

Parent Name	Consent	Parent Signature	ID No.	Name	Sex	Age (mo.)	Religion	Caste
	Y / N		050					
	Y / N		051					
	Y / N		052					
	Y / N		053					
	Y / N		054					
	Y / N		055					
	Y / N		056					
	Y / N		057					
	Y / N		058					
	Y / N		059					

Info on Anganwadi Health Facilities: Anganwadi ID _____ School _____									
<i>Instructions to you will be in Italics: Answer questions by speaking with teachers, confirm all by direct observation</i>									
1a. Do you have a community latrine in this village? <i>Please check yes or no.</i>	<input type="checkbox"/> Yes → 1b <input type="checkbox"/> No → 2								
1b. If yes, how many latrines are available for general community use? <i>Please write in #.</i>	_____								
2. Previous Deworming Information (<i>as much detail as possible</i>):									
Program: _____ Date (month/year.): __ / ____ Name of drug used _____									
3. How many staff work at this anganwadi?	_____								
4. What is the educational level of the supervisor of this anganwadi? <i>Please tick the correct box.</i>	<input type="checkbox"/> None <input type="checkbox"/> Class 1-5 <input type="checkbox"/> Class 6-8 <input type="checkbox"/> Class 9-10 <input type="checkbox"/> Class 11-12 <input type="checkbox"/> Diploma <input type="checkbox"/> No Answer								
5. Number of latrines: <i>Please fill in the # of each type, include ALL latrines functioning or not. Sum the total at the bottom.</i>	<table border="1"> <tr> <td>For Student Boys _____</td> <td rowspan="4">Total Latrines (Sum all to left) _____</td> </tr> <tr> <td>For Student Girls _____</td> </tr> <tr> <td>For Student Unisex _____</td> </tr> <tr> <td>For Teachers _____</td> </tr> </table>	For Student Boys _____	Total Latrines (Sum all to left) _____	For Student Girls _____	For Student Unisex _____	For Teachers _____			
For Student Boys _____	Total Latrines (Sum all to left) _____								
For Student Girls _____									
For Student Unisex _____									
For Teachers _____									
6. Number of latrines with the following characteristics: <i>Please fill in the # that fit each characteristic. Note that each sub-group (eg. 6a) should add to the total # of latrines above.</i>	<table border="1"> <tr> <td>6a. Locked _____ Not locked _____</td> <td>6b. Water _____ No water _____</td> </tr> <tr> <td>6c. Serviceable _____ Not serviceable _____</td> <td>6d. Appear in use _____ Do not appear in use _____</td> </tr> <tr> <td colspan="2">6e. No attached hand-washing site _____ Attached hand-washing site no water _____ Attached hand-washing site with just water _____ Attached hand-washing site with water and soap _____</td> </tr> <tr> <td colspan="2">6f. Earth floor around latrine _____ Concrete floor around latrine _____ Ceramic/Tiled around latrine _____</td> </tr> </table>	6a. Locked _____ Not locked _____	6b. Water _____ No water _____	6c. Serviceable _____ Not serviceable _____	6d. Appear in use _____ Do not appear in use _____	6e. No attached hand-washing site _____ Attached hand-washing site no water _____ Attached hand-washing site with just water _____ Attached hand-washing site with water and soap _____		6f. Earth floor around latrine _____ Concrete floor around latrine _____ Ceramic/Tiled around latrine _____	
6a. Locked _____ Not locked _____	6b. Water _____ No water _____								
6c. Serviceable _____ Not serviceable _____	6d. Appear in use _____ Do not appear in use _____								
6e. No attached hand-washing site _____ Attached hand-washing site no water _____ Attached hand-washing site with just water _____ Attached hand-washing site with water and soap _____									
6f. Earth floor around latrine _____ Concrete floor around latrine _____ Ceramic/Tiled around latrine _____									
7. Water supply to school <i>Check all that apply to indicate facilities and functionality.</i>	<input type="checkbox"/> Mains tapped water <input type="checkbox"/> Manual well <input type="checkbox"/> Hand pump <input type="checkbox"/> Rainwater tanks <input type="checkbox"/> Collected from local source <input type="checkbox"/> No water at school <input type="checkbox"/> Hand pump is locked <input type="checkbox"/> Well is locked <input type="checkbox"/> Tap is dry <input type="checkbox"/> Well is dry <input type="checkbox"/> Rainwater tank empty								
8a. Are there hand washing sites <i>Please check yes or no.</i>	<input type="checkbox"/> Yes → 8b <input type="checkbox"/> No → 9								
8b. How many sites with each of the following: <i>Please write in numbers of each.</i>	Water only _____ Water + Soap _____ No Water, No Soap _____								
9. Is there a hygiene poster visible in the school?	<input type="checkbox"/> Yes <input type="checkbox"/> No								

Tracking: Anganwadi ID _____

Corresponding School _____

Date __ / __ / ____

Parent Name	Consent	Parent Signature	ID No.	Name	Sex	Age (mo.)	Religion	Caste
	Y / N		060					
	Y / N		061					
	Y / N		062					
	Y / N		063					
	Y / N		064					
	Y / N		065					
	Y / N		066					
	Y / N		067					
	Y / N		068					
	Y / N		069					
	Y / N		070					
	Y / N		071					
	Y / N		072					
	Y / N		073					
	Y / N		074					
	Y / N		075					

Government of Rajasthan STH Survey For School Based Deworming Programme

ANGANWADI CONSENT FORM

Complete both parts: Survey team retains part One and Anganwadi Retains Part Two

PART ONE

Anganwadi Supervisor Name.....

Anganwadi Name..... District.....

Please initial in the boxes to indicate:

- I have received the information sheet
- The information sheet has been explained to me
- My questions have been answered
- I understand I can withdraw my participation at any time
- I understand that parental consent will be obtained in order for children to participate

Please indicate your consent for the participation of your anganwadi and students in this STH survey.

I (insert name).....the anganwadi supervisor

Consent Do Not Consent

for my anganwadi and students to participate in the STH survey for the School Based Deworming Programme as described on the information sheet provided to me.

DATE:.....

SIGNATURE ANGANWADI SUPERVISOR:.....

NAME DTWI PROGRAMME MANAGER:.....

SIGNATURE DTWI PROGRAMME MANAGER:.....

PART TWO

I (insert name).....the anganwadi supervisor

Consent Do Not Consent

for my anganwadi and students to participate in the STH survey for the School Based Deworming Programme as described on the information sheet provided to me.

DATE:.....

SIGNATURE ANGANWADI:.....

NAME DTWI PROG. MNGR:.....

SIGNATURE DTWI PROG. MNGR:.....

ANY QUESTIONS PLEASE CALL: (insert this info)

QUOTE the following ANGANWADI ID:

Government of Rajasthan STH Survey For School Based Deworming Programme

SCHOOL CONSENT FORM

Complete both parts and stamp with school stamp: Survey team retains part One and School Retains Part Two

PART ONE

Head Teacher Name.....

School Name..... District.....

Please initial in the boxes to indicate:

- I have received the information sheet
- The information sheet has been explained to me
- My questions have been answered
- I understand I can withdraw my participation at any time

Please indicate your consent for the participation of your school and students in this STH survey.

I (insert name).....the headteacher

Consent Do Not Consent

for my school and students to participate in the STH survey for the School Based Deworming Programme as described on the information sheet provided to me.

DATE:.....

SIGNATURE HEAD TEACHER:.....

NAME DTWI PROGRAMME MANAGER:.....

SIGNATURE DTWI PROGRAMME MANAGER:.....

PART TWO

I (insert name).....the head teacher

Consent Do Not Consent

for my school and students to participate in the STH survey for the School Based Deworming Programme as described on the information sheet provided to me.

DATE:.....

SIGNATURE HEAD TEACHER:.....

NAME DTWI PROG. MNGR:.....

SIGNATURE DTWI PROG. MNGR.....

ANY QUESTIONS PLEASE CALL: (insert this info)

QUOTE the following SCHOOL ID:

कीड़ों से मुक्ति, बच्चों को शक्ति

कीड़े बच्चों को नुकसान पहुंचाते हैं



आँतों में कीड़े थकान, पेट दर्द, उलटी और कुपोषण का कारण हैं

वो बच्चें जो कीड़ों से मुक्त हैं, स्कूल में बेहतर प्रदर्शन करते हैं

सिर्फ एक डी-वोर्मींग की गोली, बच्चों को कीड़ा मुक्त करती है



सरकार एक राज्य - व्यापी डी-वोर्मींग कार्यक्रम की योजना बना रहा है। इसके तहत 2 - 16 साल के उम्र वाले सभी बच्चों को यह सुरक्षित, प्रभावी तथा निशुल्क दवा दी जाएगी। इलाज के लिए, सभी बच्चों को किसी भी सरकारी स्कूल या नजदीकी आंगनवाड़ी पर 15 अक्टूबर (डी-वोर्मींग दिवस) को आना पड़ेगा।

आप भी बच्चों को कीड़ा मुक्त करने की अभियान में मदद कर सकते हैं सरकार इस अभियान की परियोजना के अंतर्गत एक सर्वेक्षण का आयोजन कर रही है। यदि आपके बच्चे को उसके मल का नमूना उपलब्ध कराने के लिए आमंत्रित किया गया हो और आपने इसकी अनुमति दी हो, तो कृपया:



1. बच्चे को स्कूल में दी गयी डब्बे, सूचना पुस्तिका और प्लास्टिक के चम्मच के बारे में पूछें
2. अपने बच्चे को अखबार पर मल त्याग करने के लिए मदद करें
3. चम्मच का उपयोग कर डब्बे का आधा, बच्चे के टट्टी से भरें और फिर डब्बा दिए बैग में रखें. बाद में अपने हाथ धो लें.

4. आपका बच्चा अगले दिन वो डब्बा स्कूल में ज़रूर लाये। मल का नमूना प्रयोगशाला में जायेगा जहाँ उसमें कीड़ों की जांच होगी। सर्वेक्षण में भागीदारी आपके इच्छाधीन है. यदि आप अपने बच्चे को भाग लेने की अनुमति नहीं देते हैं तो उनके साथ डब्बा ना भेजें।

अभियान के तहत सभी बच्चों को कीड़ों का इलाज दिया जायेगा। यदि आपका बच्चा इस सर्वेक्षण में भाग नहीं लेता है तो भी दवा का हकदार होगा



de worm the world



Rajasthan Council of Elementary Education



School Water Sanitation & Hygiene Education Cell

4th Floor, 5th Block, Shiksha Sankul, J.L.N. Marg, Jaipur Ph. 0141-2708487

E-mail : swshecell@hotmail.com

No. F. 5 (4)(114)/RCEE/SWSHE/deworm-12/4583

Date : 5/6/12


1. जिला शिक्षा अधिकारी (माध्यमिक.शि.) एवं
2. जिला शिक्षा अधिकारी (प्रा.शि.)
पदेन जिला परियोजना समन्वयक
सर्व शिक्षा अभियान,
टोंक, नागौर, धौलपुर, सवाईमाधोपुर, चूरु, बीकानेर,
जयपुर, दौसा, सिरोही, बाड़मेर, कोटा, डूंगरपुर, राजसमन्द

विषय – विद्यालय आधारित कृमि नियंत्रण कार्यक्रम से पूर्व प्रिवलेन्स सर्वे आयोजित करने के क्रम में।

राज्य के समस्त राजकीय विद्यालयों (प्राथमिक से उच्च माध्यमिक तक) में अध्ययनरत समस्त छात्र-छात्राओं हेतु आंतो के कृमि नियंत्रण कार्यक्रम प्रारम्भ किया जा रहा है। राज्य के समस्त राजकीय विद्यालयों में मध्याह्न भोजन के उपरान्त समस्त बच्चों को डिवर्मिंग (कृमि नियंत्रण) की ऐलबेन्डाजोल (400 मि.ग्रा.) की गोली दी जाएगी।

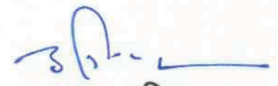
विद्यालय आधारित कृमि नियंत्रण कार्यक्रम की तैयारी हेतु बच्चों में कृमि संक्रमण की स्थिति जाँचने हेतु डीवर्म दी वर्ल्ड (कृमि नियंत्रण पर कार्यरत अन्तर्राष्ट्रीय संस्था) द्वारा शिक्षा विभाग, चिकित्सा एवं स्वास्थ्य विभाग, महिला एवं बाल विकास विभाग के संयुक्त तत्वावधान में राज्य के चयनित 13 जिलों के विद्यालयों में प्रिवलेन्स सर्वे जून-जुलाई 2012 में आयोजित किया जा रहा है।

डीवर्म दी वर्ल्ड संस्था के प्रतिनिधि जिला कार्यालय में प्रिवलेन्स सर्वे कार्य में आवश्यक सहयोग एवं समन्वयन हेतु सम्पर्क करेंगे। इस क्रम में निर्देशित किया जाता है कि सम्बन्धित ब्लाक एवं विद्यालयों को प्रिवलेन्स सर्वे कार्य में डीवर्म दी वर्ल्ड संस्था के प्रतिनिधियों को आवश्यक सहयोग एवं समन्वयन प्रदान करने हेतु पाबन्द करें।


आयुक्त

प्रतिलिपी सूचनार्थ :-

1. निजी सचिव, प्रमुख शासन सचिव, चिकित्सा स्वास्थ्य एवं परिवार कल्याण, राज.
2. निजी सचिव, प्रमुख शासन सचिव, स्कूल एवं संस्कृत शिक्षा, राज.
3. श्री आयन चटर्जी, ओपरेशन डायरेक्टर (इण्डिया), डीवर्म दी वर्ल्ड इनेशियेटिव
4. आयुक्त, माध्यमिक शिक्षा विभाग, बीकानेर
5. मुख्य कार्यकारी अधिकारी, जिला परिषद,
6. अति. जिला परियोजना समन्वयक, सर्व शिक्षा अभियान,


मुख्य अभियन्ता



Government of Rajasthan
National Rural Health Mission
Department of Medical, Health and Family Welfare
Swasthya Bhawan, Tilak Marg, Jaipur

F: 21/NRHM/Anaemia/Con.Prog./2012/ 5091

Dated: 3/7/12

To,
The Operations Director,
Deworm the world,
Bangalore, India.

Sub: Consent for Rajasthan Prevalence Study through deworm the world.

As per decision taken in meeting held on June 13, 2012 under the chairmanship of Principal Secretary, Medical Health & Family Welfare regarding a prevalence study for school-age children across Rajasthan to plan mass deworming strategies for proposed mass school-based deworming programme.

In this regard, we are giving our consent to conduct a prevalence study in following districts. The Health department will not bear any financial liabilities for this prevalence study. The districts are:

- | | | |
|-------------------|------------|---------------|
| 1. Tonk | 6. Bikaner | 11. Kota |
| 2. Nagaur | 7. Jaipur | 12. Dungarpur |
| 3. Dhaulpur | 8. Dausa | 13. Rajasmand |
| 4. Sawai Madhopur | 9. Sirohi | |
| 5. Churu | 10. Barmer | |


Director-RCH

Copy for information & necessary action to:

1. PS to Principal Secretary, Medical, Health & Family Welfare, Govt. of Raj.
2. PS to Commissioner, RCEE.
3. PS to Mission Director, NRHM
4. District Medical & Health Officers – Concerning districts are directed to provide necessary support to the persons of deworm the world in their districts.
- ✓ 5. Central Server Room
6. Office copy


Director - RCH

Appendix H: Statistical Analysis and Model Building

Analysis

Generally, environmental data were extracted for each site and linked to survey data. Logistic regression models, adjusted for clustering, were developed in STATA (Version 11, Statacorp, College Station, Texas, USA). Final models were implemented in WinBUGS version 1.4 (MRC Biostatistics Unit, Cambridge and Imperial College London, UK), which allowed for hierarchical structure in covariate data and incorporated uncertainty associated with sampling error. Models were used to predict the prevalence of *Ascaris* across the state.

Covariate Data

An age covariate for each site was included in the models, indicating the age range of students surveyed (school-aged, anganwadi-aged or from both age groups).

Monthly average land-surface temperature (LST) and precipitation at 30-arcsec (1 km) resolution were downloaded from the WorldClim website. These were produced from global weather station temperature records gathered from a variety of sources for the period 1950–2000 and interpolated using a thin-plate smoothing spline algorithm. Enhanced vegetation index (EVI; a measure of vegetation density) for 2001–2005 were obtained from the Moderate Resolution Imaging Spectroradiometer (MODIS) and elevation was obtained from an interpolated digital elevation model from the Global Land Information System of the United States Geological Survey (<http://edcwww.cr.usgs.gov/landdaac/gtopo30/>). ArcMap 10.1 (ESRI, Redlands, CA) was used to extract information on environmental variables for each point location, which were then linked to field data. Environmental covariates were standardised before modelling.

A district level indicator for literacy was extracted from the District Level Household and Facility Survey, conducted in 2007-8 in all states of India [1]. Indicators were measured from a household questionnaire administered to women aged 15-49 years of age.

Model Building

Initially a non-spatial, frequentist approach was used in Stata to select candidate variables for Bayesian spatial models. Univariate analyses of each field-collected variable were conducted to identify initial covariates associated with *Ascaris*, which were then used to build a multivariate model in a step-wise fashion. Final equivalent Bayesian models were developed and run in WinBUGS incorporating a geostatistical random effect. Models took the form:

$$Y_{ij} \sim \text{Bin}(p_{ij}, N_{ij})$$
$$\text{logit}(p_{ij}) = \alpha + \sum_{i=1}^p \beta_i \times x_i + \sum_{j=1}^p \beta_j \times x_{i,j} + u_i$$

Where Y_{ij} is the number infected in cluster i in district j , p_{ij} is the probability of a positive response within a group N_{ij} , α is the intercept, $\sum_{i=1}^p \beta_i \times x_i$ is a vector of independent variables at the cluster

level multiplied by their coefficient β_i , $\sum_{j=1}^p \beta_j \times x_{i,j}$ is a vector of independent variables at the district level multiplied by their coefficient β_j , and u_i is a spatial random effect (SRE).

Predictions of infection prevalence were made on a 5 x 5 km grid covering Rajasthan. Prediction was performed in WinBUGs using the spatial.unipred command, which implements an interpolation function (kriging) for the spatial random effect. Models were selected based on the best fit to the data and predictions then evaluated against survey data.