Evidence Action

Independent Monitoring and Coverage Validation of Schools and *Anganwadis* based mass deworming program in Uttar Pradesh – February 2016

REPORT

July, 2016

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

The World Health Organization (WHO) estimates that more than 1.5 billion or 24% of world's population is infected with soil-transmitted helminth (STH) infections worldwide. Over 270 million preschool-age and over 600 million school-age children live in areas of intensive worm transmission, and face physical, nutritive and cognitive impairment as a result of preventable STH infection. In 2001, WHO developed a strategy to control worm infection and recommended periodic mass deworming for all people living in endemic areas.[1]

India has an estimated 220 million children living with STH infection- almost one quarter of the global burden. In order to combat the high prevalence of STH, the Government of India launched National Deworming Day (NDD) program as a part of National Health Mission in February, 2015 to deworm all children between 1-19 years of age. The program aims supervised administration of albendazole tablets to all preschool and school-age children, in *anganwadis* and schools, including unregistered (1-5 years) and out-of-school (6-19 years) children.

The first round of NDD in Uttar Pradesh was observed in 24 of a total 75 districts in the state[2] on **February 10, 2016,** followed by mop-up day (MUD) on **February 15, 2016**. Evidence Action-Deworm the World Initiative, as the technical assistance partner, coordinated and facilitated planning and implementation of the deworming round in the state.

Evidence Action engaged an independent research agency to provide process monitoring on both deworming day and mop-up day to assess the preparedness of *anganwadis* and schools to implement the mass deworming program, followed by coverage validation to evaluate accuracy of the reporting data and coverage estimates post deworming. Due approvals for the survey obtained from the National Health Mission, Government of Uttar Pradesh.

On NDD and mop-up day, monitors visited 125 randomly selected government schools and 125 *anganwadis* to observe the ongoing deworming activity. Coverage validation was undertaken from February 20-26, 2016 during which monitors visited 375 randomly selected government schools and 375 *anganwadis* to verify their reported treatment figures. Findings from independent monitoring highlighted that around 59% of schools and 92% of the *anganwadis* observed deworming on NDD and MUD.

Approximately 92% of schools and 93% *anganwadis* reported to receive sufficient drugs for deworming. Around 64% of schools and 77% of *anganwadis* received program posters and

[1] WHO: Soil-transmitted helminth infections. *www.who.int/mediacentre/factsheets/fs366/en/*

[2] 24 of 75 districts were selected for NDD as 33 districts administer albendazole under LF-MDA and 18 districts were under Transmission Assessment Survey (TAS). Per the National Guidelines the district implementing LF in December were excluded from NDD. Additionally, the state decided to exclude 18 district under TAS as well.

banners. Integrated distribution of NDD kits[3] was also systemized in case of both schools (82%) and *anganwadis* (82%). 64% of schools and 78% of *anganwadis* received training for recent round of deworming. Awareness of the causes of worm infection, possible adverse events, and adverse event protocols was high among teachers and *anganwadi* workers.

High compliance with procedures and protocols was observed across the schools and *anganwadis* in the state. Almost all school principals, teachers and *anganwadi* workers were able to accurately mention at least one symptom of adverse events. Although the basic knowledge of processes for management of adverse events was high, very few teachers and *anganwadi* workers had awareness of adverse event reporting protocols. Cases of any adverse events were reported in around 15% of the schools and 11% of *anganwadis*. Coverage validation data revealed that around 70% of schools and 65% of *anganwadis* followed correct protocols for recording the number of children dewormed. However, around 36% of schools did not adhere to any recording protocol. Coverage validation data for school enrolled children exhibited high overall inflation (55%; verification factor of 0.64) of treatment figures. Nevertheless, interviews indicated that 89% of all enrolled children received a deworming tablet.

The monitoring exercise conducted during Uttar Pradesh's first round of NDD also highlights opportunities to strengthen future rounds. As training is a critical component of the program, quality and coverage of the program can be improved in future rounds by ensuring timely communication of training dates to schools and *anganwadis*. Improved attendance of school teachers in trainings would enable effective implementation of the program in the schools. The database of functionaries across all stakeholder departments needs to be regularly updated and strengthened to ensure information dissemination on the program is reaching the key audience in a timely manner to allow for action as needed. Efforts are also required to ensure that teachers who attend training also impart adequate training to other teachers in the school.

Efforts are further needed to strengthen the integrated distribution of deworming kit in the training. Integrated distribution would ensure availability of drugs at school and *anganwadi* level and enable more widespread use of IEC materials for community mobilization and awareness, potentially improving the reach of the program. In addition, tracking the distribution cascade to identify and fill gaps in a timely manner will likely improve the availability of IEC materials. Schools and *anganwadis* should be encouraged to retain a copy of school and *anganwadi* reporting forms after submission. The high levels of reporting inflation suggest that additional efforts are needed to increase accuracy of program coverage reporting, including an increased emphasis on the importance of reporting protocols during training, in IEC materials and through training reinforcement messages (SMS).

[3] Integrated distribution of NDD kits including deworming drugs, banner/poster and handout-reporting forms and provided to schools and AWC during the trainings at block or PHC level.

2. MONITORING AND EVALUATION

2.1 Study Background

Understanding program reach and quality is a key component of a successful deworming intervention. In order to fulfill this need, Evidence Action worked intensively with Government of Uttar Pradesh's health department (National Health Mission) to assess the quality of program planning and implementation with an ultimate focus on developing recommendations for improvements in future rounds. The preparedness of schools, *anganwadis,* and health systems to undertake deworming; adherence to the prescribed deworming processes; and ensuring accurate coverage reporting are key components of the supervision process. Three processes of monitoring and evaluation are included in each deworming program round: (1) process monitoring, (2) coverage reporting and (3) coverage validation.

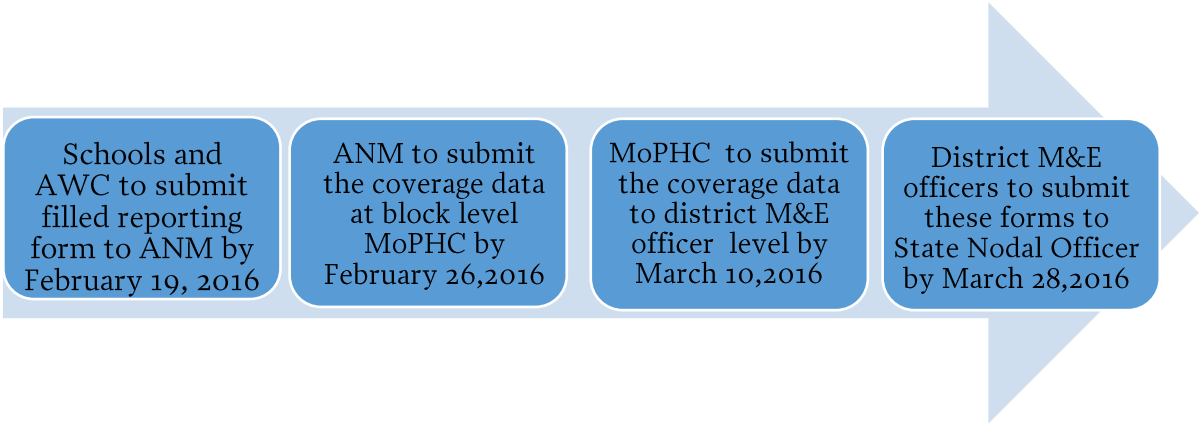
2.2 Process Monitoring, Coverage Reporting, and Coverage Validation

Process Monitoring assesses the preparedness of schools, *anganwadis*, and health systems to implement mass deworming and the extent to which they have followed correct processes to ensure a high quality deworming program. Evidence Action assessed program preparedness during the pre-deworming phase and selected independent monitors who observed the processes on deworming day and mop-up day. Evidence Action conducted process monitoring in two ways: a) telephone monitoring and cross verification and b) physical verification by visiting schools and training venues.

Coverage Reporting assesses the estimated number of program beneficiaries, and is a crucial component to measure success. With close support from Evidence Action's state and field teams, the Department of Health collected and compiled the coverage report for NDD within the established reporting timelines. School teachers and *anganwadi* workers had been trained on the recording and reporting protocols. These protocols, along with the reporting cascade and timelines (refer to Figure A below), were shared with all districts through the state's directives. In order to improve the accuracy of coverage reporting by the schools and *anganwadi*s, every participating school and *anganwadi* was instructed to follow a recording protocol for deworming.

Every teacher and *anganwadi* worker was required to put a single tick mark (✓) next to a child's name in the attendance register if they received albendazole on deworming day, and a double-tick mark (✓✓) if received on mop-up day. These tick marks are the basis for the numbers reported by every school and *anganwadi*. Schools and *anganwadi*s provided the number of enrolled/registered children dewormed by counting the single and double tick marks in the registers. Headmasters and *anganwadi* workers compiled the number of dewormed children from attendance registers, filled out the summary reporting format, and submitted it to the next level.

Figure A: Reporting cascade and timelines



Coverage Validation is an ex-post check of the accuracy of the reporting data and coverage estimates. Coverage validation data was gathered through interviews with headmasters and three students (in three different randomly selected classes) in each school, and by checking all class registers and reporting forms. These activities provided a framework to validate coverage reported by schools and to calculate the level of inaccuracy in the data by comparing the ticks with numbers reported in school reporting forms.

2.3 Sampling and Sample Size

Through a competitive selection process, Evidence Action hired an experienced independent research agency, Academy of Management Studies (AMS), to implement monitoring across the 24 selected districts of the state where deworming was implemented. A two-stage probability sampling procedure was adopted to select schools for process monitoring and schools and *anganwadis* for coverage validation (Table A). For process monitoring, *anganwadis* near sampled schools were selected. Process monitoring was carried out on two days: NDD (February 10, 2016) and mop-up day (February 15, 2016). On deworming day monitors visited 125 randomly selected government/ government aided schools and *anganwadis*, whereas on mop-up day, monitors visited 124 randomly selected government/ government aided school and 122 *anganwadis* to observe deworming. Coverage validation was undertaken from February 20-26, 2016, during which the monitors targeted to visit 375 randomly selected government/government aided schools and *anganwadis* to verify reported coverage.

Process information was collected to check for adequacy of drug supplies and awareness materials; assess whether teachers had received training; and check knowledge of adverse event management and reporting protocols. During coverage validation monitors collected information by interviewing school headmaster/teacher, *anganwadi* workers, checking attendance registers, and interviewing three children from each school.

Table A: Target and coverage of schools and *anganwadis* during independent monitoring

Indicators	Process monitoring		Coverage validation	
	Target	Achieved	Target	Achieved
Total number of districts	24	24	24	24
Total number of blocks	125	125	125	125
Total number of schools	250	249	375	376
Total number of children interviewed in schools	250	187	1125	924
Total number of *anganwadis*	250	247	375	379

2.4 Independent Monitoring Formats

To ensure comprehensive coverage and triangulation of data, four formats were administered - one each for process monitoring at schools and *anganwadis* on NDD and mop-up day, and one each for schools and *anganwadis* for coverage validation. Evidence Action designed and finalized formats in consultation with National Health Mission – Department of Health, Government of Uttar Pradesh. The formats were translated into the regional language, checked to ensure that the language was concise and easily understandable, and loaded onto tablet PCs. Using these four standard formats, monitors collected information on training, availability and use of IEC material, availability and submission of reporting forms, and frequency and management of adverse events.

2.5 Authorization from Government

The surveys were conducted with prior approval of the state government. An approval letter was issued by Department of Health, Government of Uttar Pradesh. Each monitor carried copies of the letter explaining the process of monitoring and coverage validation, and requesting participation from school and *anganwadi* staff.

2.6 Training of Trainers and Independent Monitors

A two-phase training program was organized at the state level. In the first phase, representatives from Evidence Action provided a one-day comprehensive training to three master trainers of AMS in Delhi on February 3, 2016. These master trainers conducted a two-day training of 182 monitors during February 6-7, 2016 in batches of 50-55 monitors, supervised by Evidence Action at Moradabad. A total of 182 trainees participated, including 10% buffer monitors and 25 supervisors.

The training included discussions on the deworming initiative, importance of independent monitoring, and monitoring formats. Afterwards, all relevant formats were shared. Monitors received a demonstration of tablet PCs and were briefed on computer assisted personal interview (CAPI) administration process and troubleshooting. Upon completion of these modules, each monitor used the tablet to complete at least one practice session in the presence of trainers. During this period, trainers replied to any queries, and a live demonstration was conducted after the practice session. At the end of the training, all participants were tested on their degree of comprehension and ability to work in the field.

2.7 Field Implementation

Each monitor was allotted two schools and two *anganwadis* for process monitoring. Subsequently, they were allotted three schools and three *anganwadis* to survey for coverage validation. Monitors were provided a tablet PC, charger, printed copy of monitoring formats, and albendazole tablets for demonstration. The details of sample schools were shared with them one day before fieldwork commenced to ensure that monitors do not inform local educational authorities ahead of their visit, thus potentially affecting compliance.

For process monitoring monitors were instructed to visit schools first and then a nearby *anganwadi*. In most cases, however, schools administered albendazole tablets only after the mid-day meal, so monitors were instructed to revisit those schools around noon after collecting information from *anganwadi*s. For coverage validation, however, the strategy was slightly modified; if a school was closed or non-traceable, monitors were asked to cover the next school on their list, and return to the first school at another time on a subsequent day. If the school was non-traceable or closed consistently after attempting three visits, a new school was substituted for the old one.

Monitors' attendance and compliance with protocols were assessed by the supervisors. The monitors completed both formats by 4:00 pm, and then reported to their supervisors. Data was synced to the main server after completion of work, and assessed and scrutinized for comprehensiveness.

2.8 Quality Control

Appropriate quality control measures were taken to ensure data collected was accurate and comprehensive. Approximately 20% of schools and *anganwadis* were contacted over the phone, next day to confirm that they had participated in monitoring and validation. In addition, district coordinators visited sampled schools to spot check the monitoring processes and tele-callers contacted schools and *anganwadis* to verify monitoring visits. In all cases, school and *anganwadi* staff were asked to sign a participation form and provide an official stamp, verifying that the school or *anganwadi* was actually visited. The data synced to tablets was vetted as quickly as possible to ensure comprehensiveness, and errors were subsequently addressed by follow up visits or calls.

3. KEY FINDINGS

Key results from independent monitoring are provided below, with further details shared in annexures.

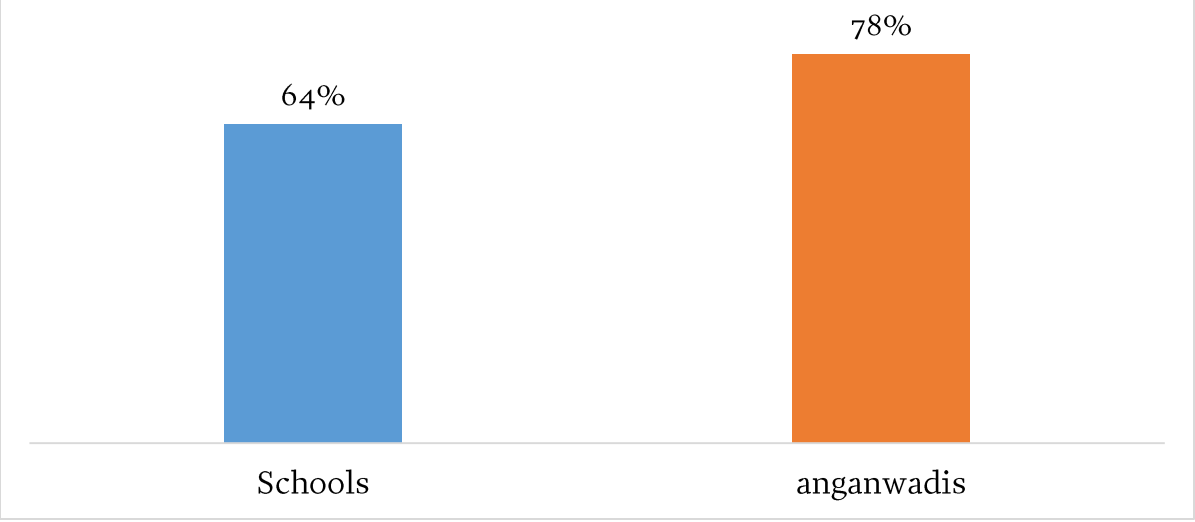
3.1 Training

For effective implementation of NDD, teachers and *anganwadi* workers are trained prior to the deworming day. Independent monitoring data demonstrated that teacher/ headmasters from 64% of schools and 78% of *anganwadi* workers received training for the deworming round[4] **(Figure 1).** Among those who did not attend training, majority of teachers (59%) and *anganwadi* workers (47%) cited unawareness about the date and time of training as the main reason. **(Annexure 1 – Table 1)**.

Approximately 10% of schools and 77% of *anganwadis* reported that they did not receive an SMS about deworming schedule **(Annexure 1 – Table 1)**. Additionally, even in schools where a headmaster/teacher attended training, only 49% provided training to all other teachers in the school **(Annexure 1 – Table 1)**.

[4] Findings from both process monitoring and coverage validation were grouped together for this indicator.

Figure 1: Attended training for National Deworming Day

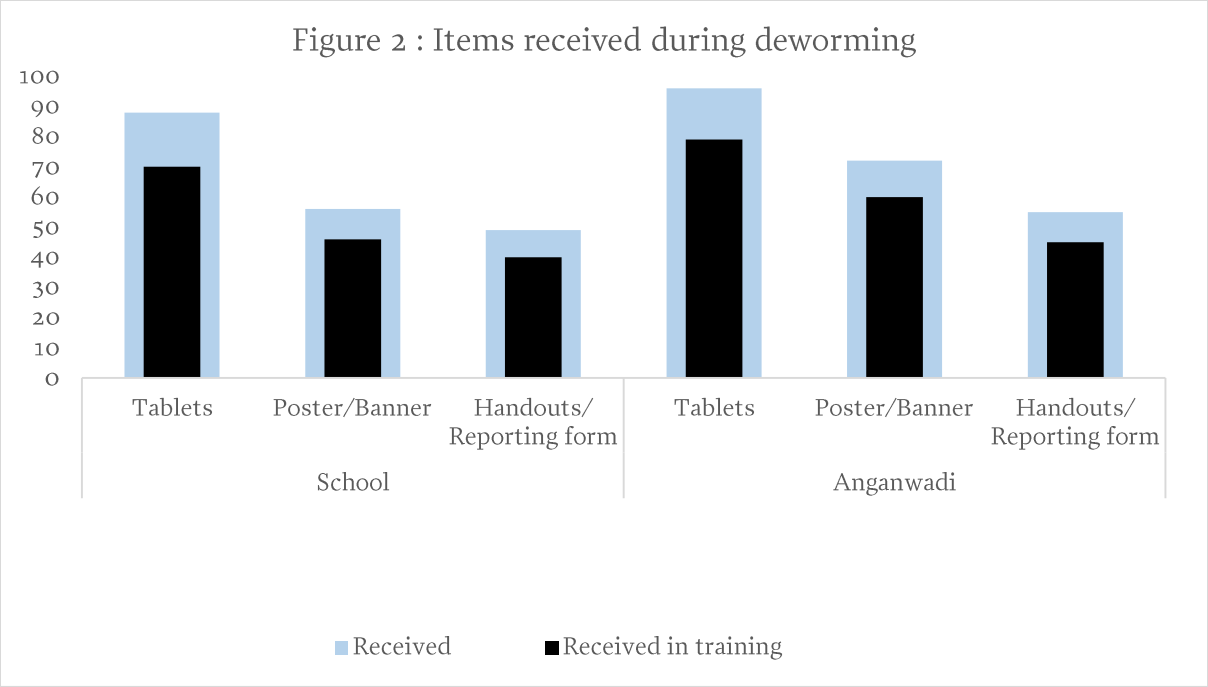


3.2 Integrated Distribution of Deworming Materials Including Drugs

As per NDD guidelines, there should be an integrated distribution process, providing all necessary IEC and training materials along with deworming tablets to schools and *anganwadi* centers at Block level training.[5] Despite the well-defined NDD kit and integrated distribution cascade, findings from independent monitoring demonstrate that only 80% of schools and 82% of *anganwadis* in the state had integrated distribution of deworming materials. ***(Annexure 1 – Table 1).***

Around 88% of schools and 96% of *anganwadis* received tablets for deworming; however, about 70% of schools and 79% of *anganwadis* received these tablets during training ***(Figure 2 & Annexure 1 – Table 2).*** Moreover, 92% of schools and 93% of *anganwadis* reported to have received sufficient drugs for deworming ***(Annexure 2 – Table 1).*** Only about 56% of schools and 72% of *anganwadis* received poster/banners whereas, around 46% of schools and 60% of *anganwadis* received banner/posters in training ***(Figure 2 & Annexure 1 – Table 2).*** Only about 49% of schools and 55% of *anganwadis* received handouts/reporting forms and 40% of schools and 45% of *anganwadis* received them in the training ***(Figure 2 & Annexure 1 – Table 1)***

[5] 'National Deworming Day, Operational Guidelines 2016, Ministry of Health and Family Welfare, Government of India http://nrhm.gov.in/images/pdf/NDD-2016/Guidelines/Draft_NDD_2016_Operational_Guidelines.pdf



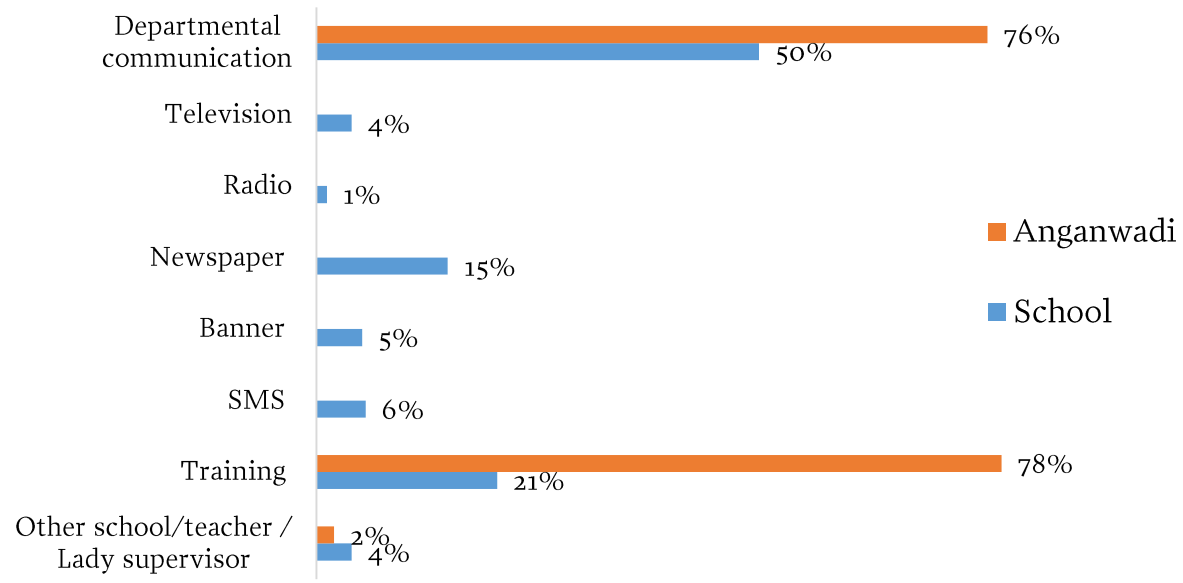
3.3 Source of Information about Recent Round of Deworming

Departmental communication was the major source[6] of information for the schools (50%) while trainings were the main source of information for *anganwadis* (78%) ***(Figure 3).*** This was followed by trainings (21%) for schools and departmental communication (76%) for *anganwadi*s. Approximately 25% and 19% of schools and *anganwadis* respectively were informed about the recent round of deworming from other sources of information ***(Figure 3 & Annexure 1 – Table 1).***

Almost all children who were interviewed reported their primary source of information about deworming to be verbal instructions and explanation from their teacher (95%), followed by the banner/poster (9%), newspapers and television (2%) ***(Annexure 1 – Table 5).***

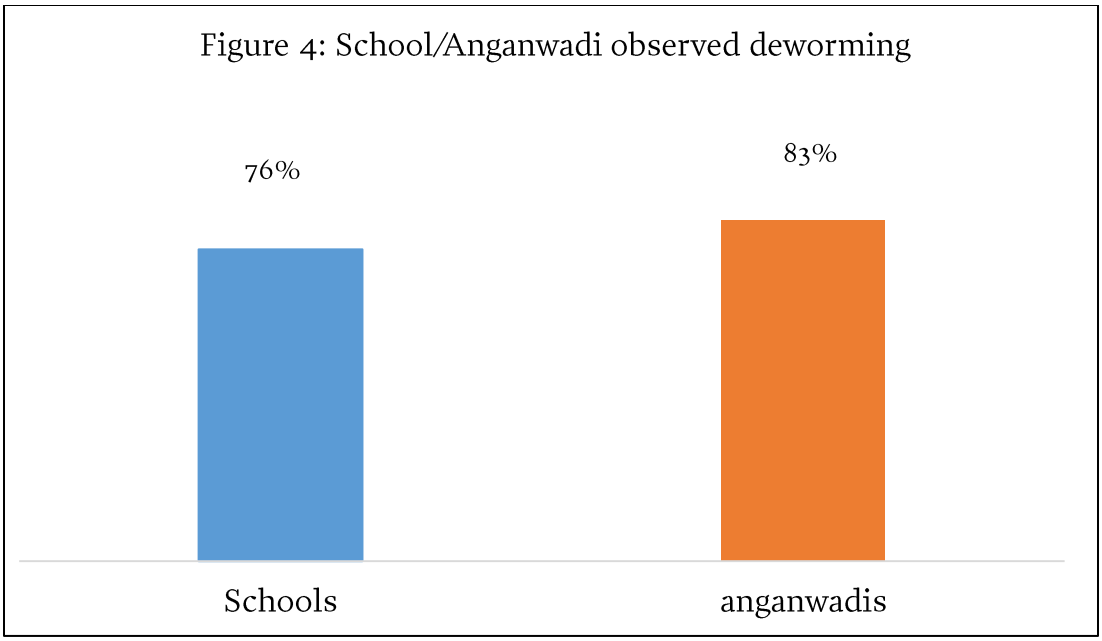
[6] Major source of information is the maximum number of a medium reported by school teachers/headmaster and *anganwadi* workers

Figure 3: Source of information about recent round of deworming



3.4 Implementation of Deworming

Independent monitoring data depicted that around 76% of schools and 83% of *anganwadis* reported to conduct deworming on the day of visit; however, monitors observed ongoing deworming activity in 59% of schools and 92% of *anganwadis* respectively ***(Annexure 1 – Table 1 & 3)***. Further, coverage validation demonstrated that 82% of schools and 88% of *anganwadi*s had dewormed children during deworming or mop-up day **(Figure 4 & Annexure 2 – Table 1).** Out of the total enrolled children who were interviewed on deworming day and mop-up day, around 89% reported receiving a tablet on one of these days. Prima facie, this suggests that deworming occurred in a large proportion of schools and *anganwadis* on one of the deworming days **(Annexure 1 – Table 5)**.

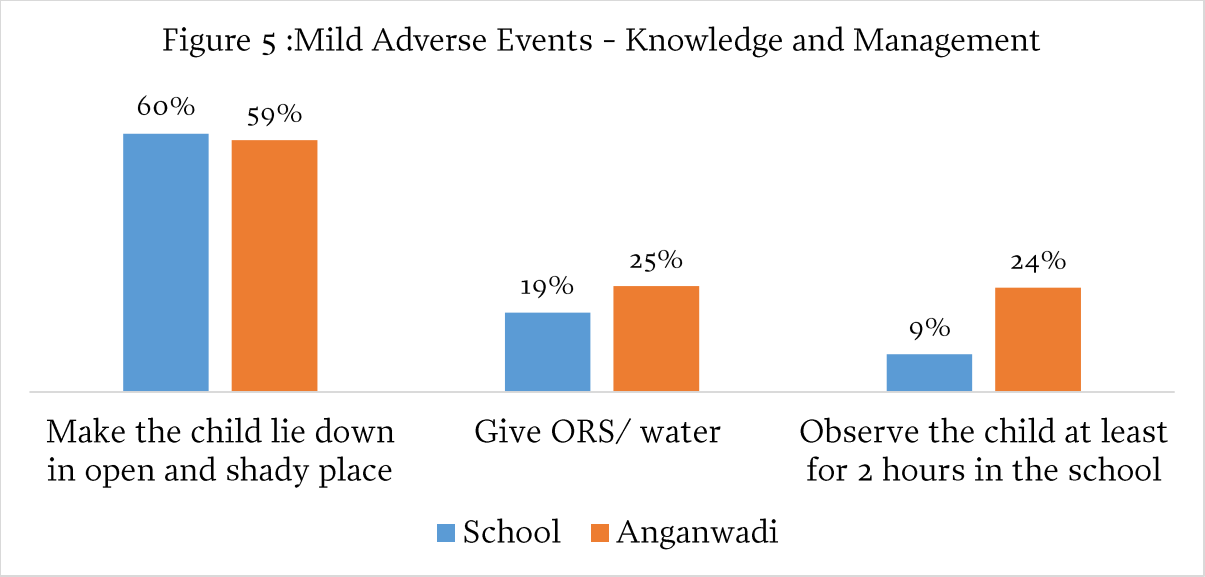


3.5 Adverse Events - Knowledge and Management

Interviews with headmasters and teachers revealed substantial awareness regarding potential adverse events, and understanding of appropriate protocols to follow in case of such events. Around 73% of schools and 78% of *anganwadi* workers asked children if they were sick before administering tablets, and 95% of schools and 97% of *anganwadi* workers did not administer tablets to a sick child ***(Annexure 1 – Table 3)***. Vomiting was listed as a symptom by 69% of the principals and 79% of *anganwadi* workers followed by mild abdominal pain (67% of principals and 61% of *anganwadi* workers), and nausea (56% of the principals and 59% of *anganwadi* workers). About 17% of school staff, and only 20% of *anganwadi* workers recognized fatigue as a symptom ***(Annexure 1 – Table 1)***.

Further, 60% of teachers and 59% of *anganwadi* workers knew to have a child lie down in an open, shady place in case of any symptoms. Only 19% of schools and 25% of *anganwadis* knew that they are to give ORS/water and observe for two hours ***(Figure 5)***. Further, less than half (48%) of schools and 53% of *anganwadis* reported the need to call a PHC doctor if symptoms persisted ***(Annexure 1 – Table 1)***.

The proportion of teachers and *anganwadi* workers who listed adverse event symptoms, and could describe response protocols, suggest that schools and *anganwadis* did not have substantial awareness about the processes to be followed, although almost all interviewed teachers listed at least one symptom and one measure to be followed in case of an adverse event. Around 15% of schools and 11% of *anganwadis* reported any case of mild adverse event ***(Annexure 1 – Table 3)***.



3.6. Recording Protocol

Coverage validation data ***(Annexure 2 – Tables 2 & 4)*** demonstrated that 45% of schools and 84% of *anganwadi*s followed correct recording protocols, while 54% percent of schools did not adhere to the protocols. Of these non-adhering schools, 36% did not follow any recording protocol ***(Annexure 2 – Table 2).*** During training, teachers and *anganwadi* workers were instructed to retain a copy of school/*anganwadi* reporting forms; however, 15% of headmasters and *anganwadi* workers interviewed during process monitoring were not aware of this requirement ***(Annexure 1 – Table 1).*** During coverage validation, reporting forms were available in only 49% of schools and 53% of *anganwadis*. Nevertheless, 83% of schools and 81% of anganwadis had completed the reporting forms ***(Annexure 2 – Table 2).***

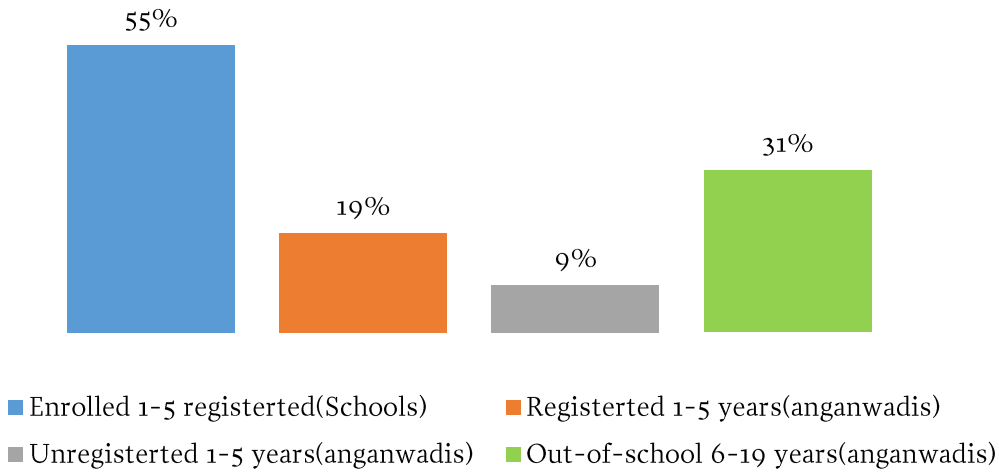
3.7 Coverage Validation

In schools and *anganwadis* sampled for coverage validation, state-level verification factors were calculated. Verification factors are common indicators for Neglected Tropical Disease control programs around the world. The verification factor compares the aggregated number of ticks in school/*anganwadi* registers (indicating that children were dewormed) to the coverage reported by schools/*anganwadis* in reporting forms submitted to the state. A verification factor of 1 means the schools reported the exact same figures that they recorded on deworming day. A verification factor less than 1 indicates over-reporting, while a verification factor greater than 1 indicates under-reporting. Thus, the verification factor was estimated on the basis of availability of a copy of reporting forms at schools and *anganwadis*.

As mentioned in the previous section, only 49% of schools and 53% of *anganwadis* had a copy of the reporting form available after deworming and mop-up day. The state level verification factor for enrolled children was 0.64, indicating that for every 64 enrolled children who were recorded as dewormed in schools, the school reported that 100 enrolled children had been

dewormed ***(Figure 6 & Annexure 2 – Table 2).*** This corresponds to an overall 55% inflation of reporting in the state, meaning that reported numbers appear to be approximately 55% higher than the numbers recorded in attendance registers. Similarly, the state level verification factors for *anganwadi* registered children, non-registered (1-5 years) and out-of-school (6-19 years) children were 0.84, 0.92 and 0.76 with corresponding inflation of 19%, 9%, and 31% respectively ***(Figure 6 & Annexure 2 – Table 4).*** Training was found to increase the accuracy of reporting; inflation was observed less among trained schools which had 49% inflation, while untrained schools had 84% inflation in reporting ***(Annexure 2 – Table 2).***

Figure 6: State level Inflation for dewormed children



Further, attempts were made to understand the maximum number of enrolled children that could have been dewormed. Coverage validation demonstrated that 82% of schools did deworming on either of the days and attendance data showed that 63% of the total school enrolled children were in attendance ***(Annexure 2 – Table 2).*** Moreover, 95% of children interviewed during coverage validation reported to have received a deworming tablet and consumed it under the supervised administration in schools ***(Annexure 2 – Table 3).*** Based on deworming implementation status and attendance of enrolled children on deworming and mop-up day and children's interview, maximum 49% (82% children out of 63% present in 95% of schools conducted deworming) children could have been dewormed during the exercise.

4. RECOMMENDATIONS

Since the program follows a fixed-day approach and engages multiple stakeholders, it is critical that all program components are aligned for successful program implementation and to prevent gaps and delays. Of particular importance are IEC, training, drug logistics, and adverse event management related preparedness. Following are the key recommendations for program improvements that emerged from this exercise.

1. The preparatory activities leading up to NDD 2016 were conducted under a compressed time schedule. In forthcoming rounds, all stakeholder engagement for planning and preparations should be initiated in advance as per the operations plan.

2. In coordination with all the stakeholder departments, consensus on fixing target population would be helpful to assess the extent of coverage and expanding reach to children not attending schools and anganwadis.

3. Training is a critical component of the program. Findings about training attendance suggest that quality and coverage can be improved in future rounds by ensuring that session are planned earlier and that greater emphasis is placed on communicating training dates. Better attendance at trainings may also be used to capture contact details, improving the ability of the deworming program to reach out to the ultimate implementers of the program. Improving attendance at trainings will likely benefit the distribution cascade as well, since drugs and materials are intended to be distributed at the time of training.

4. As substantial proportion of school headmasters and anganwadi workers did not receive deworming related SMS during NDD, the contact database of functionaries across all stakeholder departments needs to be regularly updated and strengthened to ensure comprehensive information dissemination and reaching concern officials/functionaries in a timely manner.

5. Findings suggest a need for greater focus on integrated distribution to ensure that sufficient drugs and other materials reach schools before deworming day. This requires efficient planning for the integrated training and distribution cascade to ensure that it works effectively.

6. Intensive efforts towards generating community awareness and mobilizing children to achieve high coverage will be critical for program success. For instance, parents and siblings may be targeted with specific community mobilization activities to increase coverage of out-of-school children. More engagement of ASHAs and AWWs should be encouraged, since they conduct community meetings, mobilize children, and conduct health education activities. Providing ASHAs with incentives, as approved by the national government, will motivate them to conduct activities for community engagement. Further, as most *anganwadi* centers did not have the list of out-of-school and non-registered children, efforts are required to proactively engage ASHAs to prepare these lists in their communities.

7. Coverage validation data, as well as differences in reporting between trained and untrained schools, suggest that a greater emphasis on recording protocols will improve the quality of coverage data in the future rounds.

8. The high levels of reporting inflation suggest that additional efforts are needed to increase accuracy of program coverage reporting, including increased emphasis on reporting protocols in trainings, IEC materials, and reminder SMS. Moreover, given the high inflation in reporting in both schools and *anganwadis*, it is imperative to undertake

data quality assessments (DQA) to understand the administrative and reporting challenges with program data management.

5. WAY FORWARD

Uttar Pradesh observed National Deworming Day for the first time in 2016. Program monitoring has given useful insights for increasing scale and coverage in future rounds. Aligned to the NDD operational guidelines, efforts will be coordinated to support all stakeholders more intensively in the initial phase as the program continues to scale to a greater number of districts in the state. The program should focus on improving coverage among all target populations, especially for unregistered and out-of-school children, and reaching children in private schools. Efforts will be directed on encouraging schools and *anganwadis* to follow standard recording protocols for recording dewormed children to improve the accuracy of coverage data. Further, timely implementation of a DQA will help to understand the data quality challenges and make recommendations for improvements in future rounds. Efforts should also be made to reach all 75 districts of the state to ensure greater program coverage and reduce the high burden of soil transmitted helminths (STH) in Uttar Pradesh. Continued advocacy efforts will also help to promote program sustainability by ensuring committed resources for bi-annual deworming rounds under the state's Program Implementation Plan.

ANNEXURE 1

Table: 1 Interview with headmaster/headmistress/principal and *Anganwadi* workers

Indicators	School (n=249)		*Anganwadi* (n=247)	
	%	N	%	N
Type of School (School N= 249)				
Govt./Govt. Aided schools	100.0%	249	NA	NA
Private Schools	0.0%	0	NA	NA
Respondent of the section (School N= 249)				
Headmaster/Principal	76.7%	191	NA	NA
Vice principal	6.0%	15	NA	NA
Nodal Teacher	10.8%	27	NA	NA
Any other teacher	6.4%	16	NA	NA
Category of school (School N= 249)				
Primary(1 to 5)	71.1%	177	NA	NA
Primary with upper primary(1 to 8)	3.2%	8	NA	NA
Primary with upper primary and secondary(1 to 10)	1.2%	3	NA	NA
Primary with upper primary secondary and higher secondary(1 to 12)	19.7%	49	NA	NA
Upper primary only(6 to 8)	0.8%	2	NA	NA
Upper primary with secondary and higher secondary(6 to 12)	1.6%	4	NA	NA
upper primary with secondary(6 to 10)	0.0%	0	NA	NA
Secondary only (9 to 10)	0.4%	1	NA	NA
Secondary with higher secondary(9 to 12)	0.4%	1	NA	NA
Higher Secondary only or Jr. college(11 to 12)	1.6%	4	NA	NA
Did teacher/ *anganwadi* worker attended training in last 2 months	63.5%	158	77.7%	192
Did trained teacher provide training to other teachers (School N= 158)				
Yes, trained all other teachers	48.7%	77	NA	NA
Yes, trained some other teachers	28.5%	45	NA	NA
No, did not train other teachers	22.2%	35	NA	NA
Don't know /don't remember	0.6%	1	NA	NA
Reason for not attending official training (School N= 83; *Anganwadi* N= 53)				
Location was too far away	7.2%	6	9.4%	5
Did not know the date/timings	59.0%	49	47.2%	25
Busy in other official work	4.8%	4	9.4%	5
Attended Deworming training in the past	3.6%	3	47.2%	25
Not Necessary	0.0%	0	5.7%	3
Others	31.3%	26	30.2%	16
Source of information about recent round of Deworming **program (School N= 249; *Anganwadi* N= 247)**				
Departmental communication	50.2%	125	76.1%	188
Television	4.0%	10	0.4%	1

Indicators	School (n=249)		*Anganwadi* (n=247)	
	%	N	%	N
Radio	1.2%	3	0.0%	0
Newspaper	14.9%	37	0.0%	0
Banner	5.2%	13	0.0%	0
SMS	5.6%	14	0.0%	0
Training	20.5%	51	77.7%	192
Other school/teacher / Lady supervisor	4.0%	10	2.0%	5
Others	24.5%	61	19.4%	48
Any source of information about Deworming	100.0%	249	100.0%	247
All the sources of information	0.0%	0	0.0%	0
Awareness about the ways a child can get worm infection (School N= 249)	82.7%	206	NA	NA
Sources of information about deworming tablets distribution (*Anganwadi* N= 247)				
Departmental communication	NA	NA	74.1%	183
Other *Anganwadis*	NA	NA	7.7%	19
No information	NA	NA	3.6%	9
Others	NA	NA	14.6%	36
Different ways that children can get worm infected (School N = 206; Anganwadi N= 247)				
Having foods without washing hands	85.4%	176	83.0%	205
Not washing hands after using toilets	72.3%	149	68.8%	170
Not using sanitary latrine	42.2%	87	41.3%	102
Moving in bare feet	63.6%	131	56.3%	139
Consume vegetables and fruits without washing	49.0%	101	34.4%	85
Having long and dirty nails	51.0%	105	43.3%	107
Others	5.3%	11	11.7%	29
Any way a child can get worm infection	100.0%	206	100.0%	247
Awareness about all the ways a child can get worm infection	21.8%	45	14.6%	36
Receive SMS about the Deworming program	90.0%	224	23.5%	58
Preference to receive the SMS (School N= 249;*Anganwadi* N= 247)				
Morning	20.5%	51	20.6%	51
Afternoon	18.5%	46	12.1%	30
Evening	14.9%	37	18.2%	45
Any time	40.2%	100	40.5%	100
Do not prefer the SMS	6.0%	15	8.5%	21
Having received Poster/Banner, handouts/reporting, adverse event reporting form in training (School N= 249; *Anganwadi* N= 247)	28.5%	71	35.6%	88
Visibility of the Deworming Day Poster/Banner is posted (School N=139; Anganwadi N= 179)				
Clearly posted/ visible to all	67.6%	94	73.7%	132
Hidden in a room/partially visible.	5.0%	7	9.5%	17

Indicators	School (n=249)		*Anganwadi* (n=247)	
	%	N	%	N
Not posted/ not visible	27.3%	38	16.8%	30
Awareness about to whom to submit the completed School/*anganwadi* Reporting	39.0%	97	65.6%	162
Retain a copy of the School/*anganwadi* Reporting Form at the school after submitting one copy	72.7%	181	31.6%	78
Teachers/*anganwadi* who think any adverse event can occur after taking the Deworming **tablets**	40.6%	101	32.8%	81
Possible adverse events could be reported by children after taking the tablets (School N=101; Anganwadi N= 81)				
Mild abdominal pain	67.3%	68	60.5%	49
Nausea	56.4%	57	59.3%	48
Vomiting	69.3%	70	79.0%	64
Diarrhea	13.9%	14	16.0%	13
Fatigue	16.8%	17	19.8%	16
Other, specify	5.0%	5	6.2%	5
Any possible adverse event	97.0%	98	96.3%	78
All possible adverse event	6.9%	7	9.9%	8
Response in case a child complains of mild stomach ache, nausea, vomiting, and diarrhea after taking the tablets (School N =249;Anganwadi N= 247)				
Make the child lie down in open and shady place	60.2%	150	58.7%	145
Give ORS/ water	18.5%	46	24.7%	61
Observe the child at least for 2 hours in the school	8.8%	22	24.3%	60
Response in case the child continues to report sy mptoms of stomach ache, vomiting, diarrhea, etc. even after a few hours (School N= 249; Anganwadi N= 225)				
Call PHC or emergency number	48.2%	120	52.9%	119
Take the child to the hospital /call doctor to school	55.4%	138	63.1%	142
Don't know / don't remember	11.6%	29	1.8%	4
Other, specify	4.0%	10	5.3%	12
Deworming activity going in your school/*anganwadi* today (School N= 249;				
Yes, getting now	55.8%	139	83.0%	205
Yes, after few hours	20.1%	50	NA	NA
No, will not administer today	24.1%	60	17.0%	42

Table: 2 Integrated Distribution of Drugs and IEC material

Items in NDD kit	Schools	*Anganwadi*

	Received	Verified*	Received in training	Received	Verified*	Received in training
Drugs	88.3	94.5	79.5	95.9	92.0	81.9
Poster/Banner	55.8	96.4	82	72.4	90.5	83.2
Handout-reporting form	48.5	95.0	81.8	55.0	89.7	81.6

Table3: Observation of deworming activity in the class/*Anganwadi*

Indicators	Schools		*Anganwadi*	
	Percentage	Number	Percentage	Number
Deworming activity is taking place in the class/*anganwadi* *(School N= 235; Anganwadi N= 205)*	58.7%	138	91.7%	188
Teachers/*anganwadi* worker giving any he alth education related to Deworming *(School N= 138; Anganwadi N= 188)*				
Yes	71.0%	98	60.6%	114
Could not observe as I reached late	1.4%	2	1.6%	3
What are being included by the teacher/ *a nganwadi* worker as a part of health educa tion to children*(School N= 98 Anganwadi N= 114)*				
Harmful effects of worms	64.3%	63	60.5%	69
How worms get transmitted	66.3%	65	63.2%	72
Benefits of Deworming	40.8%	40	38.6%	44
Methods of worm infection prevention	28.6%	28	32.5%	37
Comprehensive health education to children	NA	NA	NA	NA
Availability of Clean drinking water and Glasses (*Anganwadi N= 188)*	NA	NA	85.1%	160
Teacher/ *anganwadi* worker were asking t he children if they are sick/under medicat ion before giving the tablet*(School N= 138; Anganwadi N= 188)*	72.5%	100	78.2%	147
Half of crushed albendazole being given to children of 1 to 2 years age group *(Anganw adi N= 188)*	NA	NA	89.9%	169
What teacher/ *anganwadi* worker did ,If t here was any sick child in the class room(*School N= 100; Anganwadi N= 147)*				
Gave Albendazole tablet to the child	5.0%	5	3.4%	5
Did not give the Albendazole tablet to the child	95.0%	95	96.6%	142
Students/children are told to chew the tab let before swallowing it *(School N= 138*	91.3%	126	92.0%	173
Deworming tablets were distributed by*(Sc hool N=138; Anganwadi N= 188)*				

Indicators	Schools		*Anganwadi*	
	Percentage	Number	Percentage	Number
Teacher/headmaster	95.7%	132	NA	NA
anganwadi worker	NA	NA	91.5%	172
Asha/ANM	1.4%	2	6.4%	12
Students	0.7%	1	NA	NA
Others	2.2%	3	2.1%	4
Teacher/ *anganwadi* worker asking students to take Albendazole tablets in the class / *anganwadi* only*(School N=138; Anganwadi N= 188)*	97.1%	134	96.3%	181
Teachers/ *anganwadi* worker following the protocol of putting single tick ✓(Deworming day) or double tick ✓✓ (mop-up day) on each child's name/roll no. in the attendance register after giving them the Deworming tablet*(School N=138; Anganwadi N= 188)*	69.6%	96	64.9%	122
Practice followed by teacher, if the ticking/double ticking Protocol did not followed*(School N=42; Anganwadi N= 66)*				
Prepare the separate list for dewormed child	42.9%	18	66.7%	44
Put different symbols	7.1%	3	7.6%	5
Nothing was done	50.0%	21	25.8%	17
Others specify	0.0%	0	0.0%	0
Any child not given the prescribed dose of Albendazole tablet*(School N=138; Anganwadi N= 188)*				
Yes, less than the prescribed doze	11.6%	16	11.7%	22
Yes ,more than the prescribed doze	8.7%	12	5.3%	10
No, the prescribed doze is being given	79.7%	110	83.0%	156
Any adverse event observed (nausea, vomiting, stomach-pain diarrhoea, etc.) after taking the tablet*(School N= 138; Anganwadi N= 188)*	14.5%	20	10.6%	20

Table: 4 Interview with school teacher

Indicators	Percentage	Number
Attended any official training for Deworming program in the past 2 months (N=249)	50.2%	125
Received training for Deworming(N=125)		
At official level training	51.2%	64
By Headmaster/ teacher	36.0%	45
Others (specify)'	12.8%	16
Awareness about the ways a child can get worm infection (N=249)	79.1%	197

Indicators	Percentage	Number
Different ways that children can get worm infected (N=197)		
Having foods without washing hands	92.9%	183
Not washing hands after using toilets	67.0%	132
Not using sanitary latrine	41.1%	81
Moving in bare feet	59.4%	117
Consume vegetables and fruits without washing	47.7%	94
Having long and dirty nails	54.3%	107
Others	4.1%	8
Any way a child can get worm infection	98.5%	194
Awareness about all the ways a child can get worm infection	17.3%	34
If child is unwell, albendazole cannot be given to him/her (N=249)	78.7%	196
Awareness about prescribed dose of albendazole(N=249)		
One	88.8%	221
More than one	5.6%	14
Less than one	5.6%	14
Teachers who think any adverse event can occur after taking the Deworming tablets(N=249)	41.8%	104
Possible adverse events could be reported by children after taking the tablets(N=104)		
Mild abdominal pain	76.9%	80
Nausea	61.5%	64
Vomiting	80.8%	84
Diarrhea	20.2%	21
Fatigue	20.2%	21
Other, specify	3.8%	4
Any adverse event	100.0%	104
All possible adverse event	10.6%	11
In case a child complains of mild stomach ache ,nausea, vomiting, and diarrhea after taking the tablets, Your response should be (N=249)		
Make the child lie down in open and shady place	65.1%	162
Give ORS/ water	22.1%	55
Observe the child at least for 2 hours in the school	27.3%	68
If the child continues to report symptoms of stomach ache, vomitin g, diarrhea, etc. even after a few hours, Your response should be(N= 249)		
Call PHC or emergency number	50.2%	125
Take the child to the hospital /call doctor to school	69.9%	174
Don't know / don't remember	2.0%	5
Other, specify	6.8%	17

Table: 5 Interview with school child

Indicators	Percentage	Number
Single tick ✓ in front of the name of children present on Deworming **day (n=97)**		
Yes to every children	50.5%	49
Yes, but in few children	18.6%	18
No	27.8%	27
Other (specify)	3.1%	3
There were names which do not have a single tick ✓ on Deworming Day and they also do not have a double tick ✓✓ on Mop-up Day (n=92)	40.2%	37
Reason to not putting single tick ✓on Deworming **day or double tick ✓✓ on mop-up day in front of the name of all/some children (n=86)**		
They did not get Deworming drugs as they were feeling unwell	33.7%	29
Teacher did not follow the recording protocol correctly	36.0%	31
The parents of those children have refused to get their children dewormed	5.8%	5
Children refused to take the drug	11.6%	10
Other	17.4%	15
Child got a white tablet in school today	88.8%	166
Child was feeling sick before taking the tablet in the school today	9.0%	15
Child got tablet (N=166)		
By Teacher / headmaster	96.4%	160
By ASHA/ANM	1.2%	2
By Other student	0.6%	1
Other	1.2%	2
Don't know/ don't remember	0.6%	1
Child consumed tablet (N=166)	97.6%	162
Reason to not consume tablet (N=4)		
Was feeling sick	25.0%	1
Other, specify	50.0%	2
Don't know/ don't remember	25.0%	1
Awareness of child that, how to consume the tablet (N=166)		
Chewed tablet before swallowing	98.2%	163
Swallowed tablet directly	0.0%	0
Others	1.8%	3

Indicators	Percentage	Number
Awareness of child that, why tablet is provided (N=166)		
Deworming	74.1%	123
Any other answer(unrelated to Deworming)	1.8%	3
Don't know /don't remember	24.1%	40
Child was aware about Deworming **activity (n=43)**	16.3%	7
Source of information about Deworming **activity (N=129)**		
Teacher / school	94.6%	122
Television	1.6%	2
Radio	0.0%	0
Newspaper	2.3%	3
Poster/Banner	8.5%	11
Parents/siblings	0.8%	1
Any source of information	100.0%	129
All source of information	0.0%	0

ANNEXURE 2

Table 1: Findings from School/*Anganwadi* Coverage Validation data

Table:1 Coverage Validation Indicators	School Number=376		*Anganwadi* Number=379	
Indicators	**%**	**N**	**%**	**N**
Attended training for deworming program*	63.8	240	78.4	297
For schools/*Anganwadi* that didn't attend training, reasons were:				
Location of training was far away	0.00	0	16.20	12
Was not aware of the date/ timing of training	63.60	77	58.10	43
Busy in other official work	3.30	4	2.70	2
Attended deworming training in the past	5.80	7	55.40	41
Not necessary	5.00	6	4.10	3
Other reasons	28.9	35	24.3	18
Received SMS about Deworming program			22.40	85
Received the followings				
Tablets	91.20	343	91.80	348

Poster	63.80	240	76.50	290
Hand-outs/Reporting form	72.60	273	76.80	291
Deworming activity took place on NDD and mop-up day	81.90	308	88.40	335
Had sufficient drugs for Deworming	91.60	282	92.50	310
Surplus storage of drugs after Deworming	43.30	122	45.80	142
Where copy of reporting form was available after Deworming Day and Mop-Up Day	49.40	152	52.80	177
Reasons for not having a copy of the reporting form				
Did not receive	35.30	55	25.90	41
Submitted to ANM	35.90	56	64.60	102
Unable to locate	7.70	12	9.50	15
Had complete eporting form	82.90	126	80.80	143
Reported severe adverse event after taking the medicine	3.60	11	1.80	7
Average number of adverse events reported	1.73	19	2.8	20

Table: 2 School Coverage Validation Indicators

Indicators
Schools where all the classes followed the correct recording protocol = 45%
Schools where one or more of the classes followed the correct recording protocol = 46%
Schools where none of the classes followed the correct reporting protocol = 54%
Schools where one or more of the classes followed other recording protocol[7] = 19%
Schools where no reporting protocol was followed = 36%
State level verification factor = 0.64
State inflation rate (which measures the extent to which the recording in school reporting forms exceeds records at schools) =55%
State level inflation rate among trained schools (which measures how much the coverage reported in reporting forms exceeded school records in registers for schools that received training) =49%
State level inflation rate among untrained schools (which measures how much coverage reported in reporting forms exceeded school records in registers for schools that were not trained) = 84%

[7] Total schools where any of the class had '2' or '3' in D9 were counted. Total number of such schools is 58. This number was divided by 308 (schools where Deworming was observed). Consequently, the figure of 19% was arrived at.

School level inflation rate for schools that followed the correct recording protocol **(measures how much coverage reported in reporting forms exceeded school records in registers, for schools that were following recording protocols, i.e., ticking).** **=12%**
Attendance on Deworming Day=63%
Attendance on Mop-up day=56%
Children who attended on both Deworming Day and Mop-up day=48%
Maximum attendance of children on Deworming Day and Mop-Up Day **according to the CV data=71%**

Table: 3 Interview of children during Coverage validation

Indicators
Children received Deworming tablets = 97%
Children aware about the Deworming tablets =89%
Children who consumed tablets in front of teacher/headmaster = 92%
Children consumed tablet 99%
Supervised Administration of Deworming tablets = 95%
Way children consumed the tablet = 85%

Table: 4 *Anganwadi* Coverage Validation Indicators

Indicators
Anganwadi where all followed the correct recording protocol[8]=84.2%
State level verification factor for Registered children(1-5 years)=0.84
State level verification factor for non- registered children(1-5 years) = 0.92
State level verification factor for out of school children(6-19 years) =0.76
State inflation rate (1-5 years) = 19.1% (which measures the extent to which the recording in school reporting forms exceeds records at schools)
State inflation rate for non- registered children (1-5 years) = 8.7%
State inflation rate out of school children(6-19 years) = 31.3%

[8] All the Anganwadis were counted which had either C24 or C25 greater than or equal to 1. Total number was 282. This number was divided with 335 (total number of Anganwadis where NDD and mop-up day were celebrated). Thus 84.2% figure was arrived at.