



Independent Monitoring of
National Deworming Day in Bihar
February 2017

REPORT
September 2017

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EXECUTIVE SUMMARY

In India an estimated 220 million¹ children or one quarter of the global burden are living with STH infections. In February 2015, the Government of India launched National Deworming Day (NDD) to deworm all children between 1-19 years. The program aims to deworm all at-risk children through the supervised administration of albendazole tablets to all children aged 1-19 at *anganwadis* (preschools) and schools, including unregistered and out-of-school children.

Bihar observed the sixth round of NDD in all 38 districts on February 10, 2017 followed by Mop-Up Day on February 15, 2017. Evidence Action's Deworm the World Initiative, as the technical assistance partner to the state government, engaged an independent research agency to conduct process monitoring on NDD and Mop-Up Day to assess the preparedness of *anganwadis* and schools to implement the NDD program and to perform coverage validation post NDD to evaluate the accuracy of the reporting data and coverage estimates.

Findings from process monitoring highlighted that over 90% of targeted schools and *anganwadis* conducted deworming on either NDD or Mop-Up Day. Approximately, 89% of schools and 96% of *anganwadis* received sufficient tablets. However, a little more than half of schools and *anganwadis* had integrated distribution of NDD kits.² Seventy-seven percent of school teachers and 72% of *anganwadi* workers attended training for the current round of NDD and less than half of schools and *anganwadis* followed the correct protocols for recording the number of children dewormed. A substantial proportion of *anganwadi* workers did not have a list of unregistered and out-of-school children. With low compliance to recording protocols, findings exhibited an inflation of 104% (verification factor of 0.49) for children enrolled in schools. In interviews conducted, 97% or nearly all of enrolled children reported they received an albendazole tablet.

The monitoring of NDD highlights opportunities to strengthen and improve the program quality and coverage of the program such as by ensuring the timely communication of training dates to schools and *anganwadis*. Other opportunities include updating the contact database of functionaries across stakeholder departments to facilitate timely information dissemination about the program, strengthening integrated distribution of the NDD kit and enhancing the engagement of ASHAs and private schools.

¹ WHO (2014). Soil transmitted helminths, Number of children (Pre-SAC and SAC) requiring Preventive Chemotherapy for Soil transmitted helminth. Retrieved from: http://apps.who.int/neglected_diseases/ntddata/sth/sth.html

² 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.

1. MONITORING AND EVALUATION

Understanding program reach and quality is a key component in determining if a NDD round was successful. Evidence Action worked intensively with the Government of Bihar's Departments of Health, Education, and Women and Child Development to assess the quality of program planning and implementation with the objective of identifying gaps and developing recommendations for improvements in future NDD rounds. Evidence Action conducted process monitoring to understand government implementers' preparedness for NDD and their adherence to the program's prescribed processes. After NDD, we conducted coverage validation to verify government-reported treatment.

1.1 Process Monitoring and Coverage Validation

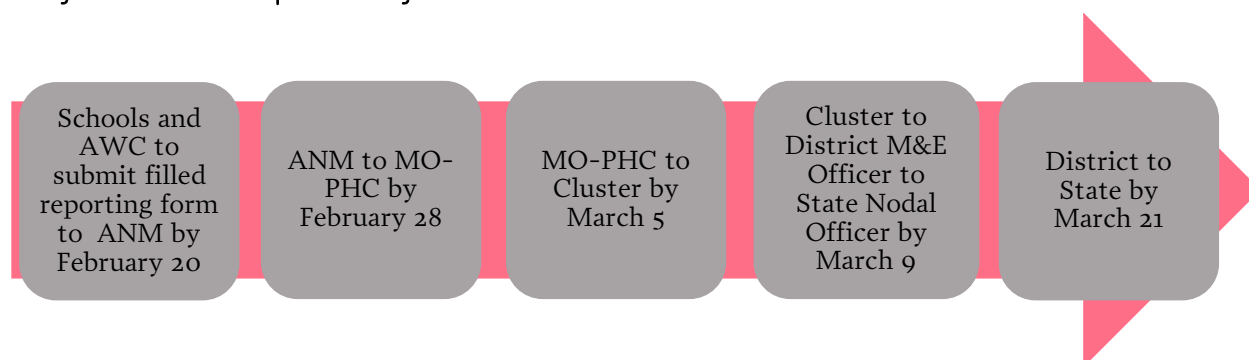
Process monitoring assesses the preparedness of schools, *anganwadis*, and health systems to implement NDD and the extent to which they have followed the recommended processes to ensure a high quality program. Evidence Action assessed program preparedness during the pre-NDD phase and retained independent monitors to observe the processes on NDD and Mop-Up Day. Evidence Action conducted process monitoring in two ways: a) telephone monitoring and b) physical verification by visiting schools, *anganwadis*, and training venues.

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

1.2 Recording and Reporting Process

Recording and reporting processes are an important means to assess the estimated number of program beneficiaries. With close support from Evidence Action's team, the Department of Health collected and compiled the coverage report for NDD within the reporting timelines. The functionary trainings included a session on reporting protocols, cascade, and timelines (refer to **Figures A** below) and were shared with districts through state directives. To record deworming at schools and *anganwadis*, a single tick mark (✓) is placed next to a child's name in the attendance register if they were dewormed on NDD, and a double-tick mark (✓✓) if dewormed on Mop-Up Day. 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



1.3 Sampling and Sample Size

Evidence Action hired GFK, an experienced independent research agency that provided 125 monitors; GFK conducted independent monitoring in all 38 implementing districts and adopted a two-stage probability sampling procedure to select schools and *anganwadis* for independent monitoring (Table A). A total of 250 schools and 250 *anganwadis* were covered during process monitoring on NDD and Mop-Up Day, and 625 schools and 625 *anganwadis* during coverage validation.

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	38	38	38	38
Total number of Blocks	125	125	125	125
Total number of schools	250	250	625	625
Total no. of children interviewed in schools	NA	NA	1875	1776
Total number of <i>anganwadis</i>	250	250	625	625

1.4 Independent Monitoring Formats

To ensure comprehensive coverage and triangulation of data, three formats were administered: one combined tool 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 with approvals from Bihar’s Department of Health. The formats were translated into the regional language, checked to ensure that the language was concise and easy to understand, and loaded onto tablet computers.

1.5 Authorization from the Government

Evidence Action conducted independent monitoring with approval from the state government. Once the state government requested participation from each school, the monitors carried a copy of the letter to the authorization letter to the schools and *anganwadis*, and explained the process of monitoring and coverage validation to a school headmaster or teacher or *anganwadi* worker while requesting their participation.

1.6 Training of Trainers and Independent Monitors

A two-phase training program was organized, with Evidence Action providing a one-day comprehensive training to two GFK master trainers in Delhi on February 3, 2017, followed by the master trainers further conducting a two-day training of 150 monitors (including buffer monitors) during February 7-8, 2017. The training included a brief orientation on NDD, the importance of independent monitoring, and details on the monitoring formats. At the end of the training, trainer tested all participants on their comprehension and ability to work in the field in order to qualify to participate.

1.7 Field Implementation

Each monitor covered one school and one *anganwadi* for process monitoring on NDD and Mop-Up Day to collect information on the availability of drugs, IEC materials, and further observations. Subsequently, each monitor covered five schools and five *anganwadis* for coverage validation. Monitors received a tablet computer, charger, printed copy of monitoring formats, and albendazole tablets for demonstration. Monitors obtained the details of sample schools one day before fieldwork commenced to ensure that monitors did not contact the schools and *anganwadis* in advance. During coverage validation, if a school closed or not traceable, monitors covered the next school on their list and returned to the first school on a subsequent day. If the school was non-traceable or closed consistently after attempting three visits, monitored substituted it with a new school. In the absence of reporting forms, the calculation of the verification factor is restricted to the sample where the copy was found for verification.

1.8 Data Processing and Analysis

The survey agency provided data to Evidence Action in the agreed upon electronic format. Evidence Action reviewed all the data sets during pre-defined checkpoints, shared feedback, shared feedback to the agency for any inconsistencies observed, and once again reviewed the data sets after the survey agency addressed any inconsistencies. All the analysis was performed using Stata version 13/14 and Excel 2013.

1.9 Quality Control

Appropriate quality control measures were taken to ensure the data collected was accurate and comprehensive. Evidence Action representatives contacted selected schools and *anganwadis* by phone to confirm monitors visited sampled schools and *anganwadis*. Evidence Action staff also visited in select schools and *anganwadis* to spot and cross check the monitoring processes and to further verify monitoring visits. In all cases, school and *anganwadi* staff signed a participation form with an official stamp to verify that the school or *anganwadi* was actually visited. Further, monitors also verified the photographs of schools and *anganwadis* collected during IM data collection and built in to the CAPI system for process monitoring and coverage validation to prove the location of the interview.

2. KEY FINDINGS

Key results³ and comparisons with the prior round from independent monitoring are provided below in below, with further details shared in annexures.

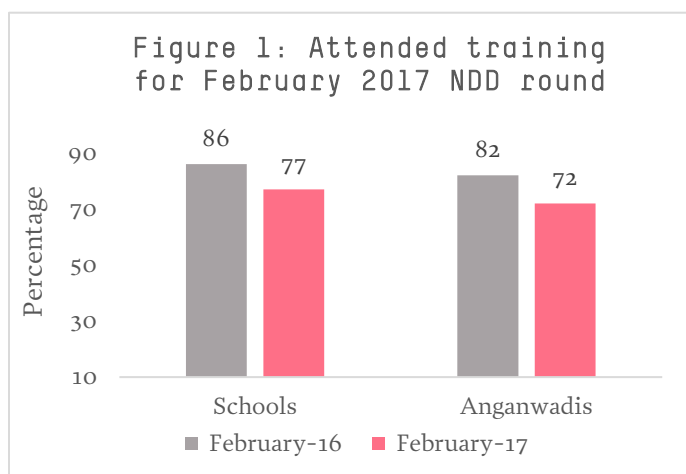
2.1 Training

For the effective implementation of NDD, teachers and *anganwadi* workers are trained prior to the NDD round to account for teacher/*anganwadi* worker turnover and ensure an integrated distribution of drugs and IEC (posters/banners) materials during training sessions. Data in **Figure 1** shows that 77% of schools and 72% of *anganwadi* workers attended training for the current NDD round. Although all school teachers and *anganwadi* workers are expected to attend training for each round (regardless of training attendance in previous rounds), the percentage of schools and *anganwadis* that attended training for the February 2017 NDD round declined from the February 2016 round by nine percentage points for schools and 10 percentage points for *anganwadis* (**Figure 1**). Of those who did not attend, the majority of the teachers (61%) and *anganwadi* workers (55%) were unaware of training dates and venue locations. A lack of information about the date and location of NDD trainings impacted the training attendance of teachers/headmasters and *anganwadi* workers as well. Around 72% of schools and only 50% of *anganwadis* reported that they received an SMS about NDD (**Table 1**). The contact database should be updated on a regular basis in line with mandated annual updates to the Unified District Information System for Education (U-DISE). One of the main reasons for low training attendance during the current NDD round could be partly attributed to postponed PHC level trainings and delayed confirmation of training dates. Training schedules were also impacted by cultural activities in the state like *Prakash Parv* and *Manav Shrinkhla*. Only 69%

³ The Process Monitoring and Coverage Validation data are based on sampled schools and *anganwadis*, sampling weight is estimated for block in each district using selection probabilities. The sampling weights are further normalized at the state-level to obtain standard state weights. All subsequent tables are based on the weighted sample except *anganwadis* Process Monitoring.

of trained teachers provided training to other teachers in their schools. To ensure improved training quality and the success of the program, trained teachers should impart further training to other teachers in their schools.

Only 19% of private schools reported receiving NDD training (**Table 6**). The lack of information about training dates and times was the main reason for the majority of private schools (66%) not attending trainings. Private schools require further engagement through ensuring information on training dates and locations is accurately communicated.



2.2 Integrated Distribution of NDD Materials Including Drugs

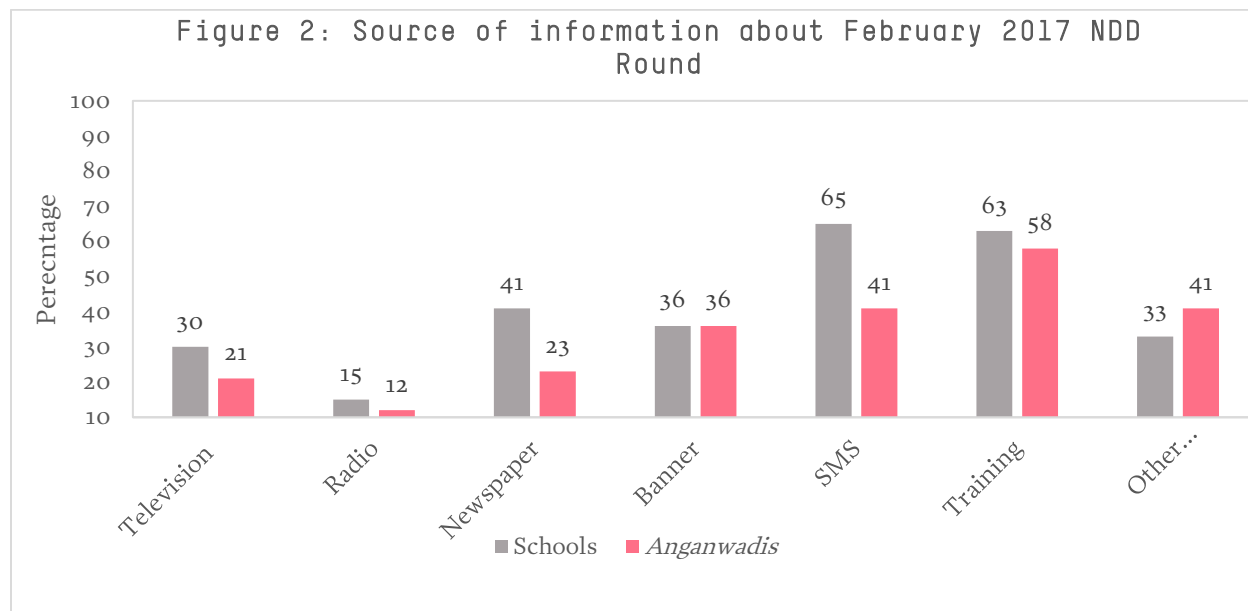
The NDD guidelines mandate integrated distribution of deworming tablets along with all IEC and training materials to schools and *anganwadi* centers at block/cluster level training in the form of a complete NDD kit.⁴ It is important to integrate the distribution of all NDD materials with trainings to ensure the timely and cost effective delivery of materials, as separate integration would increase the cost and time spent. Despite the well-defined distribution cascade plan for integrating NDD kits, findings showed that only 55% of schools and 58% of *anganwadis* in the state had integrated distribution of materials. This indicates that in a large number of schools and *anganwadis*, drugs and IEC materials were distributed separately from training sessions. As a result, a significant distribution of materials happened individually in trainings. Around 93% of schools and 92% of *anganwadis* received tablets for deworming, while 77% of schools and *anganwadis* received posters/banners. About 75% of schools and 76% of *anganwadis* received handouts/reporting forms. Moreover, around 89% of schools and 96% of *anganwadis* reported received sufficient drugs for deworming (**Table 2**).

Among private schools, only 53% received tablets for deworming and of those that received tablets, 49% reported having a sufficient quantity. Twenty-six percent of the private schools covered during process monitoring received banners/posters for deworming, and only 19% of private schools reported having received handouts/reporting forms (**Table 6**), indicating a need for further strengthening.

⁴ ‘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

2.3 Source of Information about the Recent Round of NDD

Sixty-five percent of schools reported receiving information on NDD via SMS, followed by newspapers (41%). Training was the major source⁵ of information for *anganwadis* (58%), followed by Lady Supervisors (41%). Around 30% of schools and 21% of *anganwadis* reported receiving information about NDD through television. Radio was the least effective source of information about NDD for this round as only 15% of schools and 12% of *anganwadis* reported to know about NDD through radio. (Figure 2).



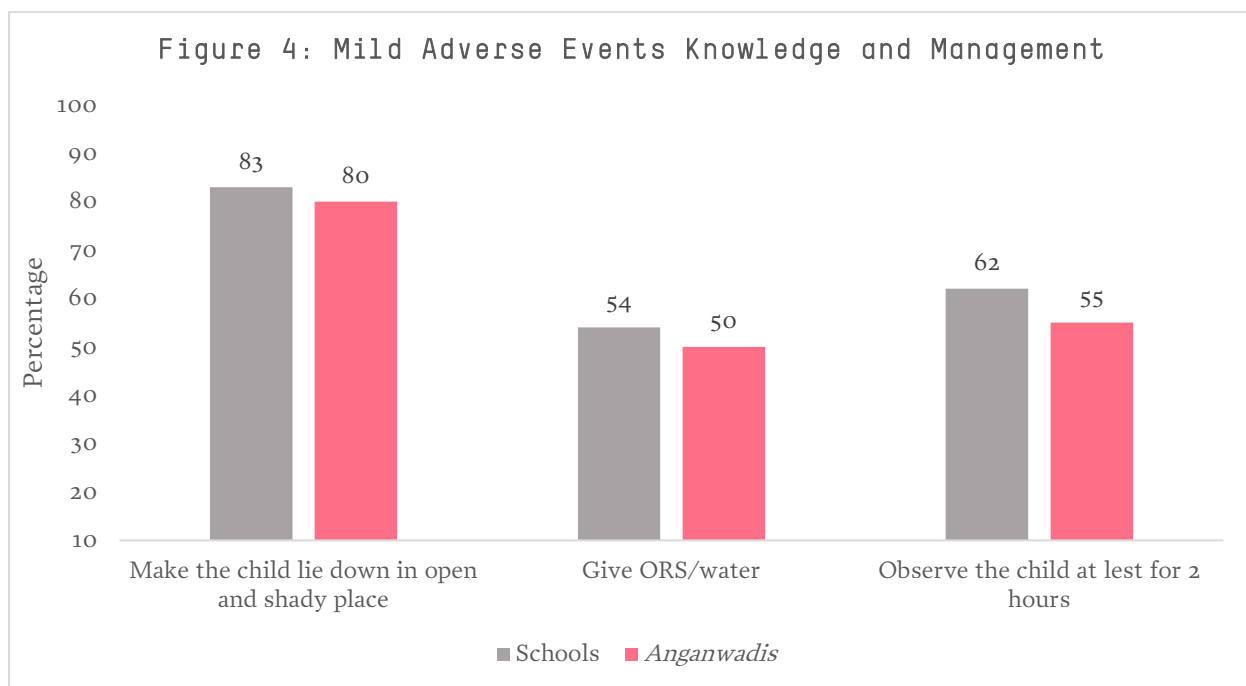
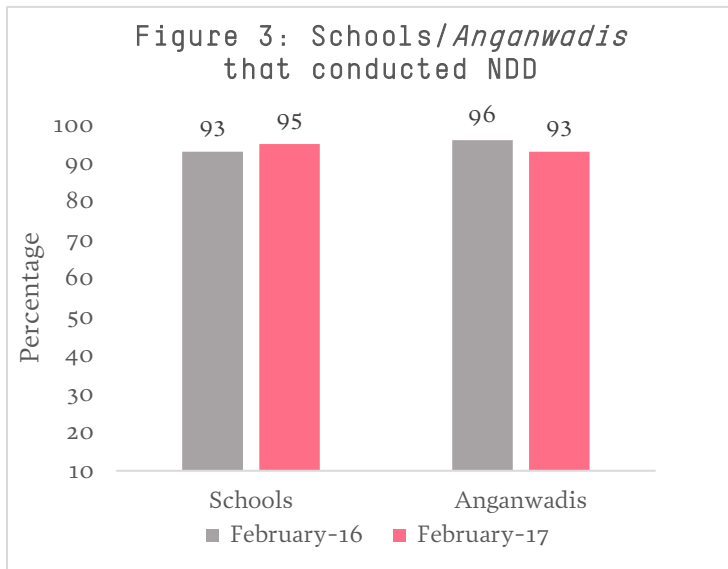
2.4 NDD Implementation

The proportion of schools and *anganwadis* that conducted deworming was high and remained constant during both the February 2016 and February 2017 NDD rounds. Process monitoring data shows that around 91% of schools and 90% of *anganwadis* reported conducting deworming on either NDD or Mop-Up Day. Out 221 schools that conducted deworming, monitors were able to observe ongoing deworming activity in 82% of schools and 73% of *anganwadis* respectively (Table 4). Further, coverage validation demonstrated that 95% of schools and 93% of *anganwadis* had dewormed children during NDD or Mop-Up Day (Figure 3).

⁵Major source of information is the maximum number of a medium reported by school teachers/headmaster and *anganwadi* workers

2.5 Adverse Events - Knowledge and Management

Interviews with headmasters, teachers, AWWs revealed a high degree of awareness regarding potential adverse events due to deworming and a high level of understanding about the appropriate protocols to follow in the case of such events. Vomiting was listed as a symptom by 89% of teachers and *anganwadi* workers. Around 77% of teachers and 67% of *anganwadi* workers reported abdominal pain as a symptom of an adverse event. Around 73% of school staff and 65% of *anganwadi* workers recognized nausea as a symptom as well (Table 5). Eighty-three percent of teachers and 80% of *anganwadi* workers knew to make a child lie down in an open, shaded place in the case of any symptoms; 54% of schools and 50% of *anganwadi* workers knew to give ORS/water and observe for two hours (Figure 4). Further, 79% of schools and 78% of *anganwadis* reported the need to call a PHC doctor if symptoms persisted (Table 5).



2.6 Recording Protocol

Coverage validation data demonstrated that 43% of schools and 45% of *anganwadis* followed correct recording protocols. Around 13% of schools and 19% of *anganwadis* followed partial protocols (marking down different symbols or making a list of dewormed children), however, 44% of schools and 36% of *anganwadis* did not follow any protocol to keep records of dewormed children (**Table CV2**). Further, we observed that reporting forms were available in only 55% of schools and 56% of *anganwadis*. As recommended in the NDD guidelines, teachers and *anganwadi* workers are mandated to retain a copy of reporting forms; 12% of headmasters and nine percent of *anganwadi* workers were not aware of this requirement (**Table PM1**).

As per NDD guidelines, Accredited Social Health Activists (ASHAs) have a critical role to play in the success of the NDD program through generating community awareness and mobilizing out-of-school children. As part of the community mobilization and awareness campaign, ASHAs conduct village meetings with parents and disseminate information through local platforms such as *gram panchayats* and village health, sanitation, and nutrition committee (VHSNC) meetings to ensure greater coverage. ASHAs inform the community about the harmful effects of worm infestation, benefits of deworming, and behavior change practices required to reduce re-infection to beneficiaries. ASHAs are also the main point of contact for out-of-school children, who are hard to reach and more heavily infected than school going children.

ASHAs receive an orientation on NDD during monthly review meetings. During their training, ASHAs receive a resource toolkit that includes a handout focusing on their roles and responsibilities towards community mobilization. After NDD, *anganwadi* workers (AWWs) prepare a list of out-of-school preschool- and school-age children who have missed the dose due to absence or sickness and share the list with ASHAs. ASHAs then work to inform parents to have their children be present to take the missed albendazole dose on Mop-Up Day.

Further, as per NDD guidelines, ASHAs are required to prepare a separate list of the children not attending schools and *anganwadis* and submit it to *anganwadi* workers. ASHAs can then claim a payment of Rs. 100 after submission. This incentive further promotes accurate coverage reporting and is intended to support the goal that every eligible child, especially out-of-school children, is administered albendazole. However, findings suggest that lists of out-of-school (6-19 years) and unregistered (1-5 years) children were available for only 37% of out-of-school children and 41% of unregistered children in *anganwadis* respectively (**Table CV1**).

2.7 Coverage Validation

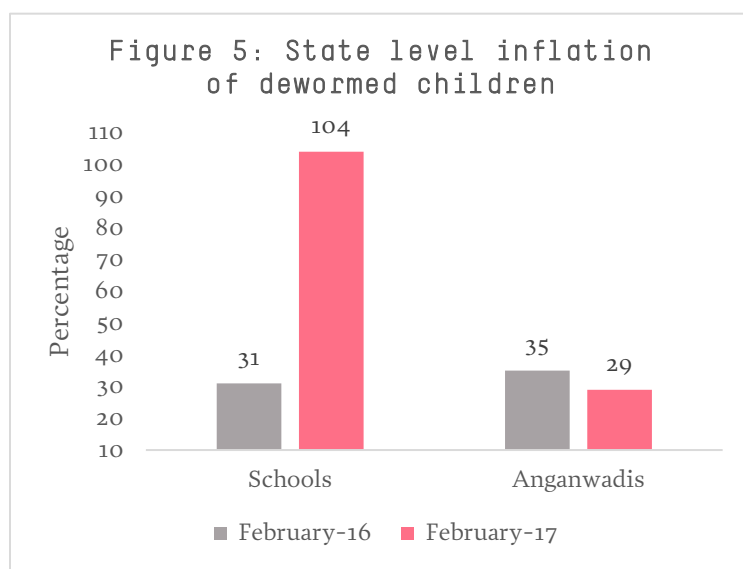
Verification factors⁶ are common indicators for Neglected Tropical Disease control programs around the world.⁷ The verification factor is a comparison of the aggregated number of ticks in school and *anganwadi* registers (indicating that children were dewormed) to the coverage report submitted by schools/*anganwadis* to the state. Thus, the verification factor was estimated based on the availability of a copy of reporting forms at schools and *anganwadis*. The state-level verification factor for school-enrolled children was 0.49, indicating that on average, for every 100 dewormed children reported by the school, 49 were verified through available documents. This corresponds to an overall 104% inflation of reporting in the schools, meaning that reported numbers are approximately 104% higher than the numbers recorded in school attendance registers. Similarly, overall state-level verification factors for children dewormed at *anganwadis* was 0.77, with an inflation of 29%. **Figure 5** presents the trend in state-level inflation rates for schools and *anganwadis* from the February 2016 to the February 2017 NDD round. The inflation rate has increased from 31% to 104% in the schools, but it has decreased from 35% to 29% in *anganwadis* from the February 2016 to the February 2017 NDD round. The lack of proper documentation at schools partly attributed to the increase in the inflation rate. However, category-wise verification factors for registered (1-5 years), unregistered (1-5 years), and out-of-school (6-19 years) children were 0.73, 0.96, and 0.67 with corresponding inflations of 37%, 4%, and 49% respectively (**Table CV2**).

The state government reported 94% coverage in schools and 88% in *anganwadis*. Through coverage validation, attempts were made to understand the maximum number of children that could have been dewormed in the schools and *anganwadis*. Coverage validation findings suggest that on average, we could verify 49% of treatment figures reported by schools and 77% for *anganwadis*. Applying these verification factors to the respective government reported coverage, we estimated that 46% (49% of 94) of children could have been dewormed in the schools and 68% (77% of 88) in *anganwadis*. The verification factors are based on only those schools and *anganwadis* where a copy of reporting forms were available for verification. Therefore, adjusted coverage in schools and *anganwadis* based on the verification factor needs to be interpreted with caution.

⁶A 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.

⁷ WHO (2013), Data Quality Assessment tool for Neglected Tropical Diseases: Guidelines for Implementation, December 2013

Further, we also estimated NDD treatment coverage in schools considering the maximum attendance of children on NDD dates. The coverage estimates based on attendance data provides a more robust estimate compared to the adjusted coverage based on the verification factor: as maximum attendance is calculated from all the schools covered during coverage validation. Coverage validation data showed that 95% of schools conducted deworming on either NDD or Mop-Up Day, a maximum of 83% of children were in attendance, 97% of children received an albendazole tablet, and 100% of children reported having consumed the albendazole tablet under supervision. Considering these factors, 76% ($0.95 \times 0.83 \times 0.97 \times 1.00$) of enrolled children could have been dewormed in the schools. This indicates that NDD coverage in the schools lies somewhere between 46 and 76 percent in Bihar, below the WHO threshold of 75% coverage (**Table CV2**). Further, unlike schools, as child interviews were not conducted during coverage validation in *anganwadis*, we could not provide an alternate estimate of the coverage at *anganwadis*.



2.8 Trend Analysis

To understand the trend of select indicators over the NDD rounds, indicators are presented in graphical form (**Figures 6, 7, and 8**). Data comparison in **Figure 8** shows a marginal decline in the percentage of schools and *anganwadis* where headmasters, teachers, and *anganwadi* workers attended training. In the February 2016 round, 86% of headmasters/teachers attended NDD training; whereas in the February 2017 round, this declined to 77%. The percentage of *anganwadi* workers that attended training decreased from 82% to 72% during the same period. The lack of information about NDD training schedules continues to be the main reason for teachers/*anganwadi* workers not attending NDD trainings (**Figure 6**). In addition, key activities such as *Prakash Parv* and *Manav Shrinkhla* impacted the block level trainings. As evident from the state coverage report, postponement of training sessions resulted in a number of teachers/*anganwadi workers* being unable to attend.

Compared to the August 2016 round, there was a slight increase in the percentage of schools that conducted deworming and received sufficient drugs. The percentage of schools that received posters/banners and handouts/reporting forms increased by 12 percentage points. Integrated distribution almost doubled from the August 2016 to the February 2017 NDD round. A possible reason for this increase is the continued efforts of Bihar's government and the continued provision of technical assistance by Evidence Action. However, there are continued

opportunities for improvement such as increasing the percentage of schools that follow correct recording protocols, which declined by 22 percentage points from the February 2016 to the February 2017 NDD round (Figure 7).

Furthermore, school findings also depict improvements on all selected indicators under consideration for *anganwadis*, except a decline in the percentage of *anganwadis* that followed correct recording protocols. The percentage of *anganwadis* that received posters/banners and handouts/reporting forms increased by 15 and 12 percentage points respectively. Unlike schools, the percentage of *anganwadis* that received SMSs increased by 14 percentage points. Moreover, integrated distribution in the February 2017 NDD round was double that of the previous round. However, *anganwadis* that followed the correct recording protocol declined by six percentage points compared to the previous round (Figure 8).

Figure 6: Comparison of training indicators for schools/*anganwadis* February 2016 and February 2017 NDD rounds

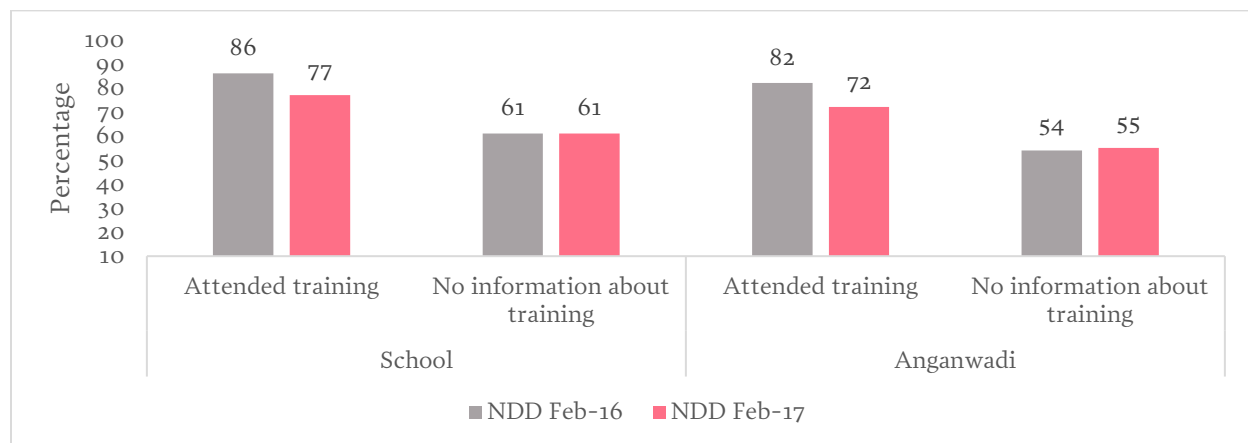


Figure 7: Comparison of key indicators in schools during February 2016 and February 2017 NDD round

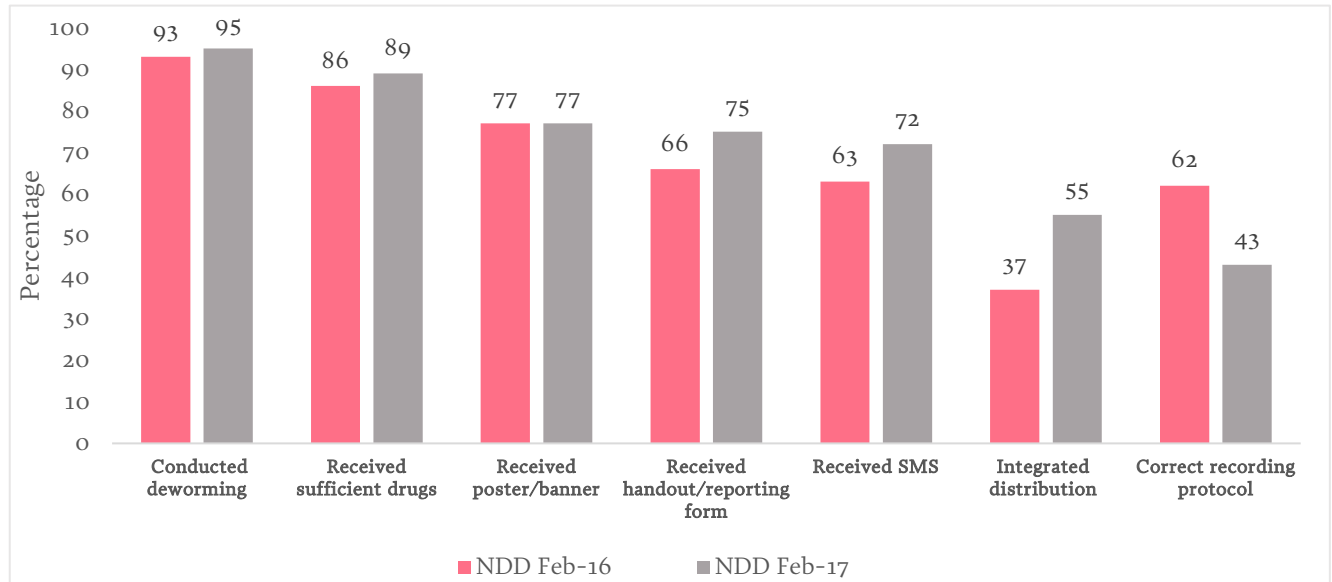
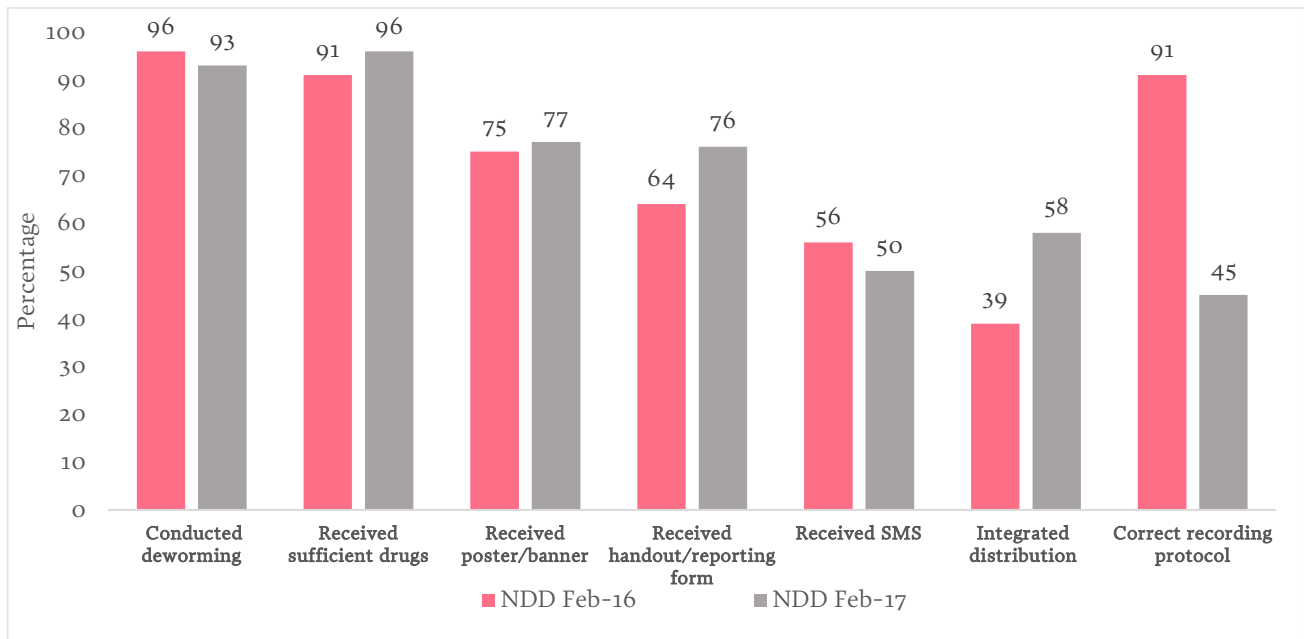


Figure 8: Trend of key indicators in *anganwadis* during the February 2016 and February 2017 round



3. RECOMMENDATIONS

The monitoring exercise conducted during Bihar's NDD round in February 2017 identifies gaps and opportunities to improve and strengthen future rounds. NDD leverages a fixed-day approach, requiring intensive and coordinated efforts between all stakeholders to successfully implement the program and to prevent gaps and delays. The following are the key recommendations for program improvements that emerged from the process monitoring and coverage validation exercise.

1. Training participation of school teachers declined from the February 2016 to February 2017 NDD round. Participation of the teachers should be encouraged and leveraged in the next round of NDD to ensure the successful implementation of a high quality NDD program. The pre-planning of sessions and timely communication of training dates and venue locations to schools and *anganwadis* will be helpful in improving future training attendance. Emphasis should be on improving training quality and on administering quality assurance tools such as training monitoring and sending training reinforcement messages (SMS) on promoting awareness about worm infections, its prevention, dose administration, and adverse events management. School teachers and headmasters who attend training must be mandated to impart adequate training to other teachers in the school.
2. Although around three-fourths of the school headmasters and half of the *anganwadi* workers receive deworming related SMS, updating the contact database of functionaries across all stakeholder departments will further ensure the maximum reach of reinforcement messages among school teachers and *anganwadi* workers. This will further facilitate comprehensive, effective, and timely dissemination of information to functionaries. For future rounds, all stakeholder departments will be encouraged to update the contact database for all 38 districts.
3. While integrated distribution increased from the February 2016 round to the February 2017 NDD round in Bihar, it is still low and needs to be strengthened with a focused approach. As most of schools and *anganwadis* received training and IEC materials, but had low integrated distribution rates, distribution occurred by other means. Focused efforts are required to align the distribution cascade to hand over NDD kits to the teachers/headmasters and *anganwadi* workers at the time of training. Procurement delays and issues around coordinating logistics for dug distribution at the block level trainings and communicating training dates influenced the program's ability to integrate distribution. Reinforcement on integrated distribution during video conferences and through SMS alerts will also be helpful in facilitating effective integrated distribution.
4. As a substantial proportion of *anganwadi* centers did not have a list of unregistered and out-of-school children, efforts are required to proactively engage ASHAs to prepare

these lists in their communities. Increased engagement of ASHAs and AWWs should be encouraged, since they facilitate community meetings, mobilize children, and conduct health education activities. ASHA participation could be further strengthened by highlighting the role of ASHAs in the joint directive issued by the state, encouraging ASHA participation in training sessions, and sending reminder SMS to them with information on incentives. Further emphasis on generating community awareness and mobilizing children will be helpful in achieving high NDD coverage.

5. As findings revealed a decreased performance of private schools on monitoring indicators, more attention should be given to encourage the participation of private schools in training, facilitate drug logistics, IEC, and manage adverse events.
6. Coverage validation findings suggest low levels of adherence to correct recording protocol. Greater emphasis on recording protocols during training sessions is likely to improve the quality of coverage data in the next round. Training and reinforcement messages shared through SMS needs to increase focus on the importance of correct reporting protocols and maintaining correct and complete documentation. We recommend practical sessions on recording protocol for teachers and *anganwadi* workers are organized during primary health center (PHC) level training sessions.
7. Although the average attendance observed in schools increased from previous rounds, further emphasis on this will be helpful for the state to meet universal coverage.
8. Findings from the coverage validation revealed a lesser availability of copies of reporting forms at schools and *anganwadis*, which directly impacts the evaluation of reported coverage data. Along with providing two copies of reporting forms during training, trainers should also ensure that teachers/headmasters and *anganwadi* workers understand the directive to maintain a copy of reporting forms.

4. WAY FORWARD

Program monitoring of NDD in Bihar has provided useful insights on the opportunities to increase coverage in future rounds, while also identifying gaps in program planning and implementation. Evidence Action will continue to work with the Government of Bihar to coordinate efficient planning for future rounds, strategies for integrated distribution and its supervision, and emphasis on recording and reporting. Further attention needs to be directed on scaling the program in private schools. This will help to improve the accuracy of coverage data. Other opportunities include advocating for departments to update the contact database of districts, facilitating the timely information dissemination on NDD, and enhancing the engagement of ASHAs mobilize out-of-school children.

Annexure

Table 1: Training, awareness and source of information about NDD among teachers/headmasters and *anganwadi* workers, February 2017

Indicators	School			<i>Anganwadi</i>		
	Denominator	Numerator	%	Denominator	Numerator	%
Attended training for current round of NDD	250	193	77	250	181	72
Reasons for not attending NDD training (Multiple Response)						
Location was too far away	57	3	6	69	9	13
Did not know the date/timings/venue	57	35	61	69	38	55
Busy in other official/personal work	57	6	11	69	9	13
Attended deworming training in the past	57	17	30	69	27	39
Not necessary	57	3	5	69	5	7
No incentives/no financial support	57	3	5	69	5	7
Trained teacher that provided training to other teachers in their schools						
All other teachers	193	132	69	NA	NA	NA
Few teachers	193	32	17	NA	NA	NA
No (himself/herself only teacher)	193	14	7	NA	NA	NA
No, did not train other teachers	193	15	8	NA	NA	NA
Awareness about the ways a child can get worm infection	250	225	90	250	215	86
Different ways a child can get worm infection (Multiple Response)						
Not using sanitary latrine	225	139	62	215	122	57
Having unclean surroundings	225	179	79	215	174	81
Consume vegetables and fruits without washing	225	180	80	215	149	69
Having uncovered food and drinking dirty water	225	183	81	215	153	71
Having long and dirty nails	225	173	77	215	151	70
Moving in bare feet	225	162	72	215	147	68
Having food without washing hands	225	189	84	215	167	78
Not washing hands after using toilets	225	163	72	215	150	70
Awareness about all the possible ways a child can get a worm infection⁸	225	93	42	215	78	36
Perceives that health education should be provided to children	250	243	97	250	236	94

⁸ Includes those who were aware that a child can get worm infection if she/he does not use sanitary latrine, have unclean surroundings, consume vegetable and fruits without washing, have uncovered food and drinking dirty water, have long and dirty nails, moves in bare fee, have food without washing hands and not washing hands after using toilets.

Indicators	School			<i>Anganwadi</i>		
	Denominator	Numerator	%	Denominator	Numerator	%
Knowledge about correct dose of albendazole tablet						
1-2 years of children	NA	NA	NA	250	229	91
6-19 years of children	250	241	96	250	242	97
Awareness about non-administration of albendazole tablet to sick child						
Will administer albendazole tablet to sick child	250	17	7	250	21	8
Will not administer albendazole tablet to sick child	250	233	93	250	229	92
Awareness about consuming albendazole tablet						
Chew the tablet	250	245	98	250	243	97
Swallow the tablet directly	250	5	2	250	7	3
Awareness about consuming albendazole in school/<i>anganwadi</i>	250	242	97	250	238	95
Awareness about the last date for submitting the reporting form	250	106	42	250	117	47
Knowledge around submission of forms to ANM	250	105	42	250	189	76
Awareness about retaining a copy of the reporting form post submission	250	221	88	250	227	91
Source of information about current NDD round						
Television	250	74	30	250	53	21
Radio	250	37	15	250	30	12
Newspaper	250	103	41	250	57	23
Banner	250	90	36	250	89	36
SMS	250	162	65	250	102	41
Other school/teacher/ <i>anganwadi</i> worker	250	82	33	250	103	41
Training	250	157	63	250	145	58
Received SMS for current NDD round	250	179	72	250	124	50

Table 2: Deworming activity, drug availability, and list of unregistered and out-of-school children, February 2017

Indicators	School			<i>Anganwadi</i>		
	Denominator	Numerator	%	Denominator	Numerator	%
Albendazole tablet administered on the day of visit						
Yes, ongoing	250	170	68	250	180	72
Yes, already done	250	22	9	250	33	13
Yes, after sometime	250	29	12	250	10	4
No, will not administer today	250	29	11	250	27	11
Schools/<i>anganwadis</i> conducted deworming on either of the days⁹	250	227	91	250	225	90
Schools/<i>anganwadis</i> conducted deworming on NDD¹⁰	125	115	92	125	111	89
Schools/<i>anganwadis</i> conducted deworming on Mop-Up Day¹¹	125	106	85	125	112	90
Attendance on NDD	39507	23823	60	NA	NA	NA
Attendance on Mop-Up Day	37200	19883	54	NA	NA	NA
Reasons for not conducting deworming						
No information	23	7	31	27	8	30
Albendazole tablet not received	23	8	37	27	8	30
Apprehension of adverse events	23	3	11	27	1	4
Others ¹²	23	5	21	27	8	30
<i>Anganwadis</i> having list of unregistered/out-of-school children	NA	NA	NA	250	112	45
Albendazole was administered to out-of-school children	NA	NA	NA	223	182	82
Albendazole was administered to unregistered children	NA	NA	NA	223	204	92
Sufficient quantity of albendazole tablets¹³	233	209	89	230	221	96

⁹ Schools/*anganwadis* administered albendazole tablet to children either on NDD or Mop-Up Day

¹⁰ Based on the samples visited on NDD.

¹¹ Based on the samples visited on Mop-Up Day only.

¹² School administer the albendazole tablet to children a day before holiday, children/student absent, postponed due to festival.

¹³ This indicator is based on the sample that received albendazole tablet.

Table 3: Integrated distribution of albendazole tablets and IEC materials, February 2017

Items	Schools				<i>Anganwadi</i>			
	Received (N= 250)	D*	Received in training	Verified	Received (N= 250)	D*	Received in training	Verified
Albendazole tablet	93 (233)	233	81 (188)	94 (220)	92 (230)	230	85 (196)	97 (222)
Poster/ banner	77 (192)	192	83 (158)	89 (171)	77 (192)	292	88 (168)	93 (178)
Handouts/ reporting form	75 (187)	187	85 (159)	91 (170)	76 (189)	189	83 (157)	93 (173)
Received all materials	65 (163)	163	85 (138)	86 (141)	66 (164)	164	88 (144)	90 (147)
Integrated distribution ¹⁴	55 (138)				58 (144)			

Note: N is the denominator for item “Received” for schools and *anganwadis*

Numerators for “Received in training” and “Verified” are given in parentheses.

*Indicates common denominator for “Received in training” and “Verified”

Table 4: Implementation of deworming activity and observation of monitors, February 2017

Indicators	Schools			<i>Anganwadi</i>		
	Denominator	Numerator	%	Denominator	Numerator	%
Deworming activity was taking place	221	182	82	223	163	73
Albendazole tablets were administered by						
Teacher/headmaster	170	167	98	NA	NA	NA
<i>Anganwadi</i> worker	NA	NA	NA	180	167	93
ASHA	NA	NA	NA	180	5	3
ANM	NA	NA	NA	180	1	1
Followed any recording protocol¹⁵	193	160	83	213	159	75
Protocol followed						
Putting single/double tick	160	136	85	159	104	65
Put different symbols	160	10	7	159	9	6
Prepare the separate list for dewormed	160	13	8	159	46	29
Visibility of poster/banner during visits	192	156	81	192	152	79

¹⁴Integrated distribution of NDD kits includes albendazole tablet, banner/poster and handout-reporting forms and provided to schools and AWCs during the trainings at block or PHC level.

¹⁵ Any recording protocol implies putting single tick (✓), double tick (✓✓), any other symbol or preparing separate list for all those children administered albendazole tablets on NDD or Mop-Up Day.

Table 5: Knowledge of Adverse events and Its Management, February 2017

Indicators	Schools			<i>Anganwadi</i>		
	Denominator	Numerator	%	Denominator	Numerator	%
Opinion of occurrence of an adverse event after administering albendazole tablet	250	53	21	250	46	18
Knowledge of possible adverse events (Multiple Response)						
Mild abdominal pain	53	41	77	46	31	67
Nausea	53	39	73	46	30	65
Vomiting	53	47	89	46	41	89
Diarrhea	53	20	38	46	12	26
Fatigue	53	24	45	46	17	37
All possible adverse event ¹⁶	53	14	26	46	9	20
Awareness about mild adverse event management						
Make the child lie down in open and shade/shaded place	250	207	83	250	201	80
Give ORS/water	250	136	54	250	126	50
Observe the child at least for 2 hours in the school	250	156	62	250	137	55
Don't know/don't remember	250	18	7	250	22	9
Awareness about severe adverse event management						
Call PHC or emergency number	250	198	79	250	195	78
Take the child to the hospital /call doctor to school	250	211	84	250	196	78
Don't know/don't remember	250	8	3	250	8	3
Occurrence of cases of any adverse event	193	11	6	213	14	7
Available contact numbers of the nearest ANM or MO-PHC	250	158	63	250	204	82

¹⁶Includes those who have knowledge that a mild abdominal pain and nausea and vomiting and diarrhea and fatigue can be reported by a child after taking albendazole tablet.

Table 6: Selected Indicators of Process Monitoring in Private Schools, February 2017

Indicators ¹⁷	Denominator	Numerator	%
Attended training for current round of NDD	25	5	19
Received albendazole tablets	25	13	53
Sufficient quantity of albendazole tablets	13	6	49
Received poster/banner	25	7	26
Received handouts/ reporting form	25	5	19
Received SMS for current NDD round	25	15	59
Albendazole administered to children	25	7	29
Reasons for not conducting deworming			
No information	18	4	25
Albendazole tablets not received	18	7	36
Already dewormed all children on deworming day ¹⁸	18	3	14
Others ¹⁹	18	5	25
Albendazole tablet administered to children by teacher/headmaster ²⁰	7	7	100
Perceive that health education should be provided to children	25	24	95
Knowledge about correct doses of albendazole tablet	25	23	90
Awareness about non-administration of albendazole tablet to sick child	25	24	97
Opinion of occurrence of an adverse event after taking albendazole tablet	25	3	11
Opinion of occurrence of possible adverse events			
Mild abdominal pain	3	2	50
Nausea	3	1	25
Vomiting	3	3	100
Diarrhea	3	1	25
Fatigue	3	1	25
Occurrence of cases of any adverse event	7	0	0
Awareness about mild adverse event management			
Let the child rest in an open and shaded place	25	12	45
Provide clean water to drink/ORS	25	6	24
Contact the ANM/nearby PHC	25	8	30
Available contact numbers of the nearest ANM or MO-PHC	25	4	17
Followed correct ²¹ recording protocol	7	7	100

¹⁷ These indicators are based on small samples, therefore, precautions should be taken while interpreting the results as these are not representative of all private schools in the state

¹⁸ Based on the samples that did not conduct deworming on Mop-Up Day.

¹⁹ School administer the albendazole tablet to children a day before holiday, children/student absent, postponed due to festival

²⁰ This indicator is based on samples where deworming was ongoing.

²¹ Correct recording protocol implies putting single tick (✓) on NDD and double tick (✓✓) for all those children administered albendazole tablets.

Table CV1: Findings from School and *Anganwadi* Coverage Validation Data

S.No	Indicators	Schools			<i>Anganwadis</i>		
		Denominator	Numerator	%	Denominator	Numerator	%
1	Conducted deworming ²²	625	592	95	625	580	93
1a	Day of albendazole administration (Multiple Response)						
	a. National Deworming Day	592	574	97	580	573	99
	b. Mop-Up Day	592	545	92	580	548	65
	c. Between NDD and Mop-Up Day	592	33	5	580	44	8
1b	Reasons for not conducting deworming						
	a. No information	33	20	61	45	2	5
	b. Drugs not received	33	12	37	45	8	18
	c. Apprehension of adverse events	33	0	0	45	3	7
	d. Others ²³	33	1	2	45	32	70
2	Albendazole left after deworming	592	170	29	580	367	63
2a	Number of albendazole left						
	a. Less than 50 tablets	170	84	50	367	194	53
	b. 50-100 tablets	170	49	29	367	98	27
	c. More than 100 tablets	170	37	21	367	75	20
3	Copy of reporting form was available for verification	592	328	55	580	326	56
3a	Reasons for non-availability of copy of reporting form						
	a. Did not receive	264	60	23	253	60	24
	b. Submitted to ANM	264	90	34	253	163	63
	c. Unable to locate	264	32	12	253	22	9
	d. Other ²⁴	264	82	31	253	9	4
4	<i>Anganwadis</i> having list of unregistered children	NA			580	239	41
5	<i>Anganwadis</i> having list of out-of-school children	NA			580	217	37

²² Schools and *anganwadis* that conducted deworming on NDD or Mop-Up Day.

²³ Other includes mainly strike of *anganwadi* worker and no incentives for deworming.

²⁴ Other includes mainly submitted to crp in brc and availability of blank form.

Table CV2: Recording protocol, verification, inflation and attendance in schools and *anganwadis*

S. No	Indicators	Schools/Children			<i>Anganwadis/Children</i>		
		Denominator	Numerator	%	Denominator	Numerator	%
1	Followed correct ²⁵ recording protocol (School)	592	252	43	580	260	45
2	Followed partial ²⁶ recording protocol (School)	592	78	13	580	108	19
3	Followed no ²⁷ recording protocol (School)	592	263	44	580	211	36
4	State-level verification factor ²⁸ (Children enrolled)	55620	27323	0.49	46230	35794	0.77
	a. <i>Anganwadi</i> registered children	NA			19934	14541	0.73
	b. <i>Anganwadi</i> unregistered children	NA			12355	11921	0.96
	Out-of-school children	NA			13939	9331	0.67
5	State-level inflation rate ²⁹ (Children enrolled)	27323	28297	104	35793	10435	29
	a. <i>Anganwadi</i> registered children	NA			14541	5393	37
	b. <i>Anganwadi</i> unregistered children	NA			11921	434	4
	c. Out-of-school children	NA			9331	4608	49
6	Attendance on previous day of NDD (Children enrolled)	115429	78623	68	NA		
7	Attendance on NDD (Children enrolled)	115429	77695	67	NA		
8	Attendance on Mop-Up Day (Children enrolled)	115429	76278	66	NA		
9	Children who attended on both NDD and MUD (Children enrolled)	115429	58567	51	NA		

²⁵ Correct recording protocol includes schools where all the classes put single tick (✓) on NDD and double tick (✓✓) on Mop-Up Day to record the information of dewormed children.

²⁶ Partial recording protocol includes schools where all the classes did not follow correct protocol, put different symbols and prepared separate list to record the information of dewormed children.

²⁷ No protocol includes all those schools where none of the classes followed any protocol to record the information of dewormed children.

²⁸ Ratio of recounted value of the dewormed children to the reported value. This calculation is based on only those schools (n=328) and *anganwadis* (n=326) where deworming was conducted and copy of reporting form was available for verification.

²⁹ Proportion of over reported dewormed children against total verified children in schools and *anganwadis*.

10	Maximum attendance of children on Deworming Day and Mop-Up Day ³⁰ (Children enrolled)	115429	95406	83	NA		
11	School level inflation rate for schools followed the correct recording protocol (Children enrolled)	23454	6723	29	NA	NA	NA
	Estimated NDD coverage based on government coverage data ³¹	46			68		
12	Estimated NDD coverage based on school attendance ³² (School)	76			N/A		

Table CV3: Indicators based on interview of children during coverage validation in schools

S.No	Indicators	Denominator	Numerator	%
1	Children received Albendazole tablets	1776	1727	97
2	Children consumed Albendazole tablet	1727	1725	100
3	Children aware about the Albendazole tablets	1727	1549	90
4	Source of information about NDD round			
	a. Teacher/school	1549	1477	95
	b. Television	1549	72	4
	c. Radio	1549	42	2
	d. Newspaper	1549	42	3
	e. Poster/Banner	1549	459	30
	f. Parents/siblings	1549	150	10
	g. Friends/neighbors	1549	115	7
5	Way children consumed the tablet			
	a. Chew the tablet	1725	1586	92
	b. Swallow tablet directly	1725	138	8
6	Supervised administration of tablets	1727	1721	100

³⁰ Maximum attendance refers to the total attendance of children who were exclusively present in school either on NDD or Mop-Up Day and children who attended school on both days.

³¹ This was estimated by implying state-level verification factor on government reported coverage for schools and AWC.

³² This was estimated based on NDD implementation status, attendance on NDD and Mop-Up Day, whether child received albendazole and its supervised administration. Since no child interview is conducted at *anganwadis*; this has not been estimated for *anganwadis*.