



Independent Monitoring of
National Deworming Day in Telangana
February 10, 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 infection. 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.

Telangana observed its first round of NDD in February 2016 and performs biannual treatment. On February 10, 2017, Telangana implemented the NDD round in all 31 districts, 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 88% of schools and 98% of *anganwadis* observed deworming on either NDD or Mop-Up Day. Integrated distribution of NDD kits improved from the previous round for both schools and *anganwadis*.² Over 95% of schools and *anganwadis* received sufficient tablets. School teacher training attendance decreased from the previous round, while *anganwadi* workers attendance increased. Coverage validation data revealed that over half of the schools and *anganwadis* followed 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. In the interviews conducted, 95% or nearly all of enrolled children reported they received an albendazole tablet.

The independent monitoring of NDD highlights opportunities to strengthen and improve program quality and coverage by ensuring 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 on the program, strengthening integrated distribution of NDD kits, enhancing the engagement of ASHAs, and increasing the engagement of private schools.

¹Soil transmitted helminths, Number of children (Pre-SAC and SAC) requiring Preventive Chemotherapy for Soil transmitted helminths, WHO (2014)

http://apps.who.int/neglected_diseases/ntddata/sth/sth.html

²Integrated distribution of NDD kits including albendazole, banner/poster and handout-reporting forms provided to schools and AWC during the trainings at cluster or PHC level.

1. MONITORING AND EVALUATION

Understanding program reach and quality is a key component in determining if an NDD round was successful. Evidence Action worked intensively with the Government of Telangana's Departments of Health, Education, and Women Development & Child Welfare 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 figures.

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 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. Coverage validation data was gathered through interviews with headmasters and *anganwadi* workers and three students (in three different randomly selected classes) in each sampled school, and by checking all registers and reporting forms in schools and *anganwadis*. 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.

Figure A: Rural Reporting Cascade and Timelines

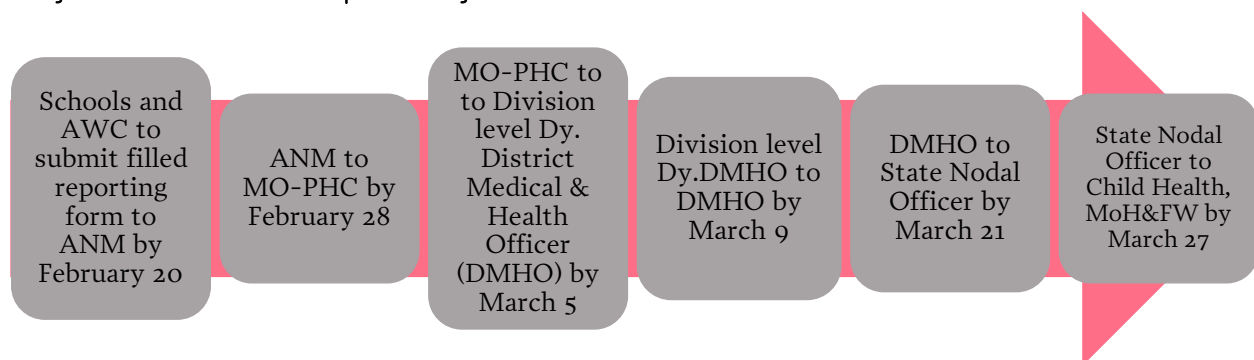
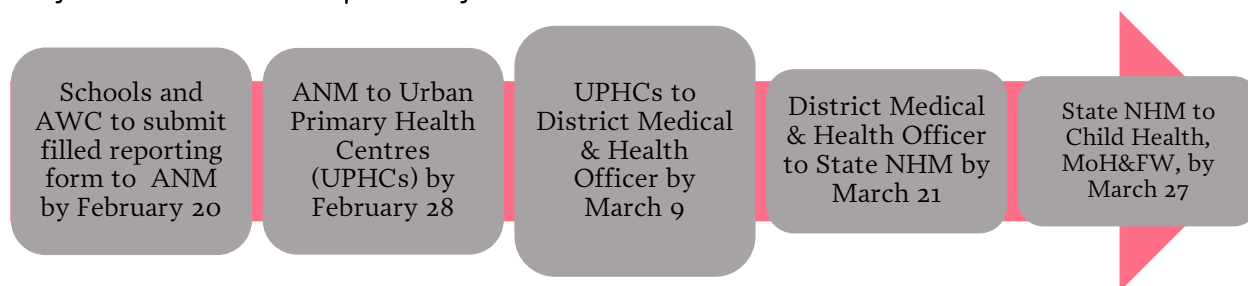


Figure B: Urban Reporting Cascade and Timelines



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 coverage reporting in the state was done using paper as well as through the NDD app. The Government of India provided the state with 98 user IDs and passwords to all divisions and districts for the NDD mobile/web application based on coverage reporting. The designated nodal government official at the block level then used the NDD application to approve NDD coverage data entered in the application by block level officials. The functionary training included a session on reporting protocols, cascades, and timelines (refer to **Figure A and B** below), and were shared with districts through state directives. To record deworming at schools and *anganwadis*, a single tick mark (✓) was required to be put 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/principals 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.

1.3 Sampling and Sample Size

Evidence Action facilitated independent monitoring in all 31 implementing districts. Through a competitive process, Evidence Action hired Karvy Insights Limited, an experienced independent research agency that provided 125 monitors. Karvy Insights also conducted independent monitoring in Telangana during the August 2016 NDD round. A two-stage probability sampling procedure was adopted to select schools and *anganwadis* for independent monitoring (**Table A**). A total of 252 schools and 248 *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	31	31	31	31
Total number of cluster/ <i>mandals</i>	125	125	125	125
Total number of schools	250	252	625	625
Total no. of children interviewed in schools	NA	NA	1875	1700
Total number of <i>anganwadis</i>	250	248	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 Telangana’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 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 master trainers of Karvy Insights Limited, 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 of the monitoring formats including computer-assisted personal interviews (CAPI) practices and practical sessions. At the end of the training, all participants were tested on their comprehension and ability to work in order to qualify to participate.

1.7 Field Implementation

Each monitor was allotted 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 was allotted five schools and five *anganwadis* for coverage validation. Monitors were provided with a tablet computer, charger, printed copy of monitoring formats, and albendazole tablets for demonstration during data collection. The details of sample schools were shared with them one day before the commencement of fieldwork to ensure that monitors did not contact schools and *anganwadis* in advance. If a school or *anganwadi* was found to be closed or non-traceable during process monitoring, it was replaced by another nearby site. During coverage validation, if a school was closed, monitors covered the next school on their list and returned 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. 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, shared the 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 Microsoft Excel 2013.

1.9 Quality Control

Appropriate quality control measures were taken to ensure data collected was accurate and comprehensive. Selected schools and *anganwadis* were contacted over the phone by Evidence Action representatives from the Delhi office and state teams to confirm monitors visited sampled schools and *anganwadis*. Further, Evidence Action staff also visited select schools and *anganwadis* to spot and cross check the monitoring processes and to verify monitoring visits. In all cases, school and *anganwadi* staff were asked to sign a participation form with an official stamp to verify that the school or *anganwadi* was visited. Further, monitors verified the photographs of schools and *anganwadis* collected during IM data collection and built in to the CAPI process 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 sub headings, with further details shared in annexures.

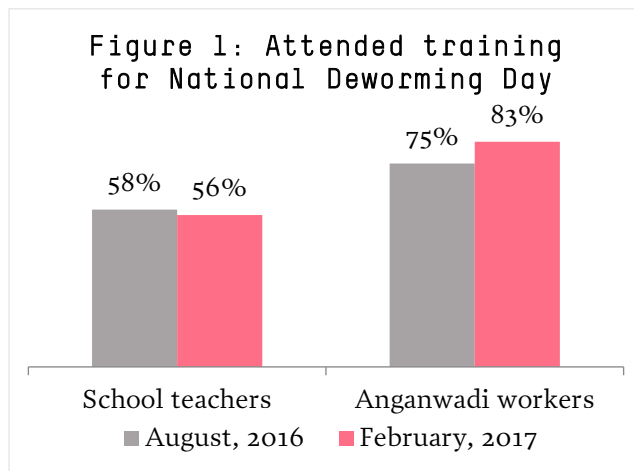
2.1 Training

For 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 posters/banners (IEC materials) during training sessions. Data in **Figure 1** shows that the percentage of headmasters/teachers who attended NDD training remained low during both the August 2016 and the February 2017 NDD round (between 56% and 58%). However, *anganwadi* workers' training attendance improved from 75% to 83% from the August 2016 to February 2017 round.

One of the reasons for low training attendance in schools during the February 2017 NDD round could be partly attributed to delayed PHC-level training and subsequent delays in the confirmation of training dates. During the August 2016 round, municipal elections in which teachers at schools were deputed on electoral duties additionally played a role in the low training attendance.

Amongst those who did not attend training, 80% of teachers/headmasters and 47% of *anganwadi* workers reported a lack of information about NDD training as the main reason for not attending training. All school teachers and *anganwadi* workers are expected to attend the training regardless of training in previous rounds. The low percentage of training of school teachers could be partly attributed to the proportion of teachers that report already having attended NDD training in the past (12%) as a

reason for not attending the February 2017 NDD round of training. Only 64% of trained teachers provided training to all 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.



³The process monitoring and coverage validation data are based on sampled schools and *anganwadis*. Therefore, sampling weights are developed for each data set except process monitoring in *anganwadis* using selection probabilities. The sampling weights are further normalized at the state-level to obtain standard state weights. All analysis tables are based on the weighted sample except *anganwadis* findings from process monitoring.

A lack of information about the date and location of NDD trainings impacted the training attendance of teachers/headmasters and *anganwadi* workers as well. Approximately 62% of schools and 86% of *anganwadi* workers reported that they received an SMS about deworming (**Table PM1**). 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). The lack of an updated contact database may have impacted the overall delivery of the SMSs to the teachers and *anganwadis* workers.

Additionally, only 34% of private schools reported receiving NDD training. Lack of information about training dates and times was the main reason for the majority of private schools (87%) not attending the training (**Table PM6**). Private schools require further engagement to ensure 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 NDD kit⁴ to ensure the timely, cost effective delivery of materials, and complete delivery of materials. Despite the well-defined distribution plan, findings show that only 56% of schools and 66% of *anganwadis* in the state had received complete NDD kits during their trainings. This indicates that in a large number of schools and *anganwadis*, drugs and IEC materials were distributed separately from trainings (**Table PM3**). Around 86% of schools and 97% of *anganwadis* received tablets for deworming, while 76% of schools and 90% of *anganwadis* received posters/banners (**Table PM3**). Moreover, 95% of schools and 96% of *anganwadis* reported having received sufficient drugs for deworming (**Table PM2**). About 74% of schools and 85% of *anganwadis* received handouts/reporting forms (**Table PM3**).

Among private schools, around 63% received tablets for deworming and almost all of these schools reported having received a sufficient quantity. Forty-eight percent of the private schools covered during process monitoring received posters/banners and 47% of private schools receive handouts/reporting forms for deworming (**Table PM6**).

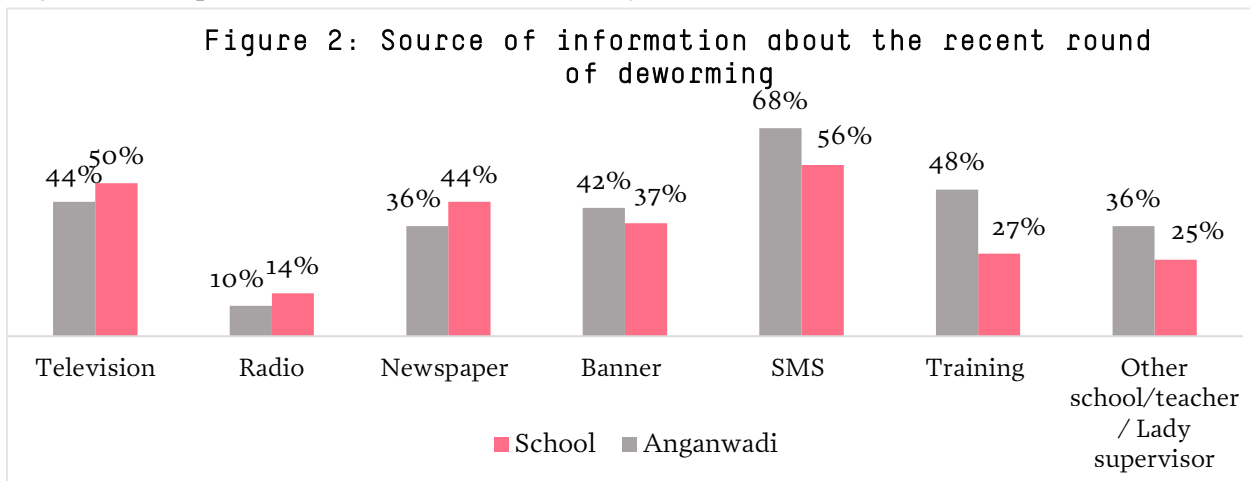
2.3 Source of Information about the Recent Round of NDD

As depicted in **Figure 2**, 56% of schools and 68% of *anganwadis* reported receiving information on NDD via SMS,⁵ half of the schools and 44% of *anganwadis* reported hearing about NDD via

⁴National 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

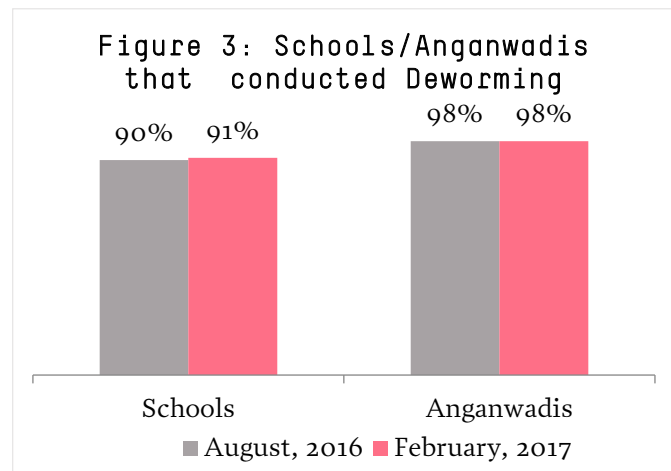
⁵Major source of information is the maximum number of a medium reported by school teachers/headmaster and *anganwadi* workers.

the television (**Figure 2**). Approximately 44% of schools and 36% of *anganwadis* also reported having received information about NDD through the newspaper. The radio was the least effective source of information about NDD for this round as only 10% of schools and 14% of *anganwadis* reported to hear about NDD through the radio.



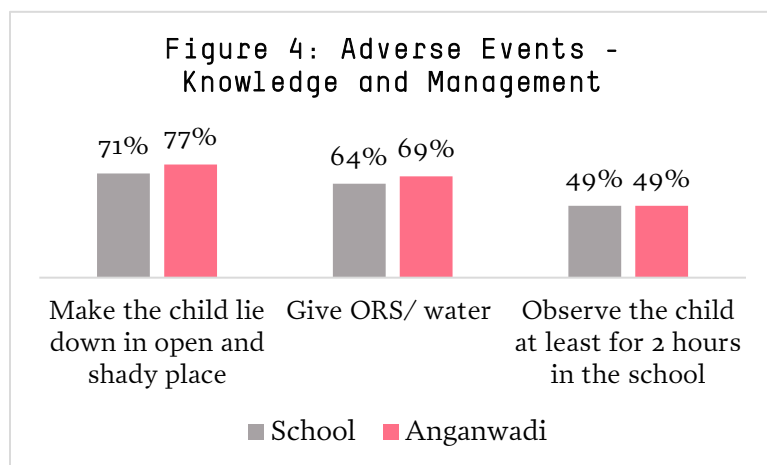
2.4 NDD Implementation

The proportion of schools and *anganwadis* that conducted deworming remained high during both NDD rounds (**Figure 3**). The coverage validation data shows that around 91% of schools and 98% of *anganwadis* dewormed children during the February 2017 round of NDD or Mop-Up Day (**Table CV1**). Out of 213 schools and 233 *anganwadis* that implemented NDD, monitors were able to observe deworming activities in 81% of schools and 83% of *anganwadis* respectively (**Table PM4**).



2.5 Adverse Events - Knowledge and Management

Interviews with headmasters, teachers, and AWWs revealed a high degree of awareness regarding potential adverse events due to deworming and a high level of understanding of the appropriate protocols to follow in the case of such events. Vomiting was listed as a symptom by 85% of principals followed by abdominal pain (83%). Eighty percent of *anganwadi* workers listed abdominal pain followed by vomiting (74%) as a symptom of an adverse event. Around 39% of school teachers and 41% of *anganwadi* workers recognized fatigue as a symptom (**Table PM5**). Further, 71% of teachers and 77% of *anganwadi* workers knew to make a child lie down in an open, shaded place in the case of any symptoms of adverse events. Sixty-four percent of schools and 69% of *anganwadis* also knew to manage an adverse event by giving ORS/water to the children and keeping them under observation for at least two hours at schools/*anganwadis* (**Figure 4**). Further, 81% of schools and 82% of *anganwadis* reported the need to call a PHC doctor if symptoms persisted (**Table PM5**).



2.6 Recording Protocol

Coverage validation data demonstrated that 57% of schools and 65% of *anganwadis* followed the correct recording protocols. For the analysis, information on recording protocol was gathered from all schools and *anganwadis* regardless of the availability of reporting forms at the site. Around eight percent of schools and 15% of *anganwadis* followed partial protocols (marking down different symbols or making a list of dewormed children), however, 35% of schools and 20% of *anganwadis* did not follow any protocol to keep records of dewormed children (**Table CV2**). As recommended in NDD guidelines, teachers and *anganwadi* workers were supposed to retain a copy of reporting forms; however, 19% of headmasters and 15% of *anganwadi* workers were not aware of this requirement (**Table PM1**). Further, was observed during coverage validation that reporting forms were available in only 50% of schools and 44% of *anganwadis*.

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 mobilizing hard to reach out-of-school 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 and preschool-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, ASHAs were required to prepare a list of the children not attending schools and *anganwadis* and submit it to *anganwadi* workers, as recommended in the NDD guidelines. However, findings suggest that lists of out-of-school (6-19 years) and unregistered (1-5 years) children were available for only 20% of out-of-school children and 36% of unregistered children in *anganwadis* respectively (Table CV1).

2.7 Coverage Validation

Verification factors⁶ are common indicators to measure the accuracy of reported treatment values for Neglected Tropical Disease control programs.⁷ The verification factor is a comparison of the aggregated number of ticks in school/*anganwadi* registers (indicating that children were dewormed) to the coverage report submitted by schools/*anganwadis* to the state. Thus, the verification factor was estimated on the basis of the availability of a copy of reporting forms at schools and *anganwadis*. The coverage estimates based on attendance data provides a more robust estimate as compared to the adjusted coverage based on the verification factor, as maximum attendance is calculated from all the schools covered during coverage validation. The state-level verification factor for school enrolled children was 0.58, indicating that on average, for every 100 dewormed children reported by the school; fifty-eight were verified through available documents. This corresponds to an overall 73% inflation of reporting in the schools, meaning that reported numbers appear to be approximately 73% higher than the numbers recorded in school attendance registers.

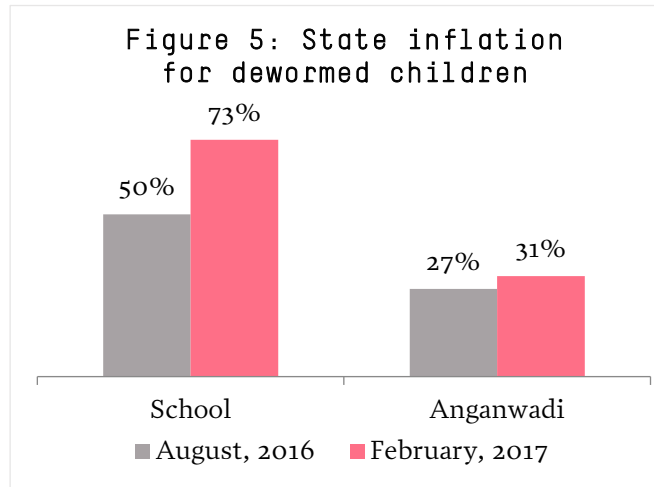
Similarly, the overall state-level verification factors for children dewormed at *anganwadis* was 0.76 with an inflation of 31%. **Figure 5** presents the change in the state-level inflation rate for schools and *anganwadis* during the August 2016 to February 2017 NDD round. The inflation rate has increased from 50% to 73% in the schools and 27% to 31% in *anganwadis* from the August 2016 to February 2017 NDD round. The increase in the inflation rate can be attributed

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.

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

to a lack of reviews of the aggregated data at schools and *anganwadi* centers prior to submission to health officials. However, category-wise verification factors for registered (1-5 years) and out-of-school (6-19 years) children were 0.74 and 0.55 with a corresponding inflation of 36% and 81% respectively (**Table CV2**).

The state government reported 97% coverage in schools and 94% 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 58% of treatment figures reported by schools and 76% reported by *anganwadis*. Applying these verification factors to the respective government reported



coverage, we estimate that 56% (58% of 97) of children could have been dewormed in the schools and 71% (76% of 94) in the *anganwadis*. The calculation of 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 verification factors need to be interpreted with caution.

Further, we also estimated NDD treatment coverage in schools considering maximum attendance of children on NDD dates. Coverage validation data showed that 91% of schools conducted deworming on either NDD or Mop-Up Day, a maximum of 94% of children were in attendance, 95% of children received albendazole tablet, and 90% of children reported to consume the tablet under supervision. Taking these factors into account, 73% ($0.91 \times 0.94 \times 0.95 \times 0.90$) of enrolled children could have been dewormed in the schools. This indicates that NDD coverage in the schools lies somewhere between 56 and 73 percent in the state, 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 imply an alternate method of estimating the coverage at *anganwadis*.

2.8 Data Quality Assessment

Process monitoring and coverage validation are conducted at service delivery points. There is limited understanding of challenges such as data management, data aggregation, reporting, and quality assurance at higher aggregation levels (i.e. sub-center/nodal, block and district). Evidence Action, with approval and participation from the state government, implemented the WHO Data Quality Assessment Tool (DQA) to verify the reported data and assess the data management and the reporting system for the NDD program in June-July 2016. The DQA

suggested that the reporting cascade was not followed below the district-level and that there was less clarity in reporting of 6-19 years out-of-school and 1-5 years unregistered children among *anganwadi* workers. Further, a lack of clarity on reporting form protocols was observed among *anganwadi* workers. Additionally, private school participation in the training programs was poor. Overall, it is important that adequate attention is given to the training cascade, the quality of information covered during training sessions, and the reinforcement of messages through SMSs, directives, letters, video conferences, and review meetings including training and program monitoring by government officials and partner organizations.

2.9 Trend Analysis

To understand the changes in selected indicators from the February 2016 to the February 2017 NDD round, indicators are presented in graphical form below (Figures 6, 7, and 8).

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

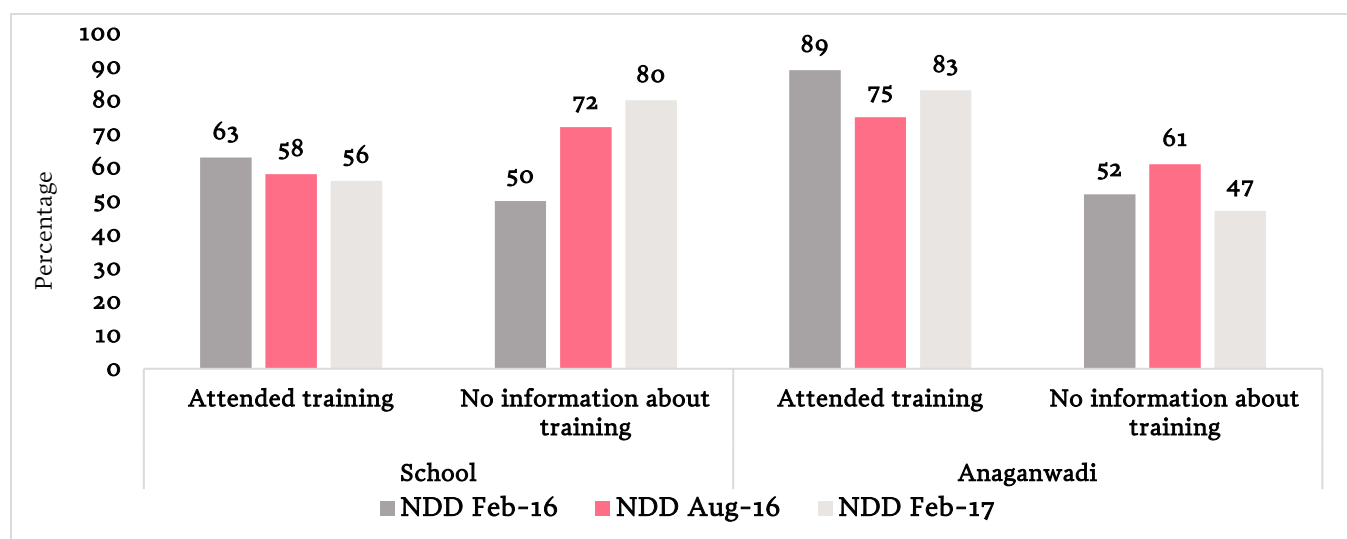


Figure 7: Comparison of key indicators in schools during the February 2016 and February 2017 NDD rounds

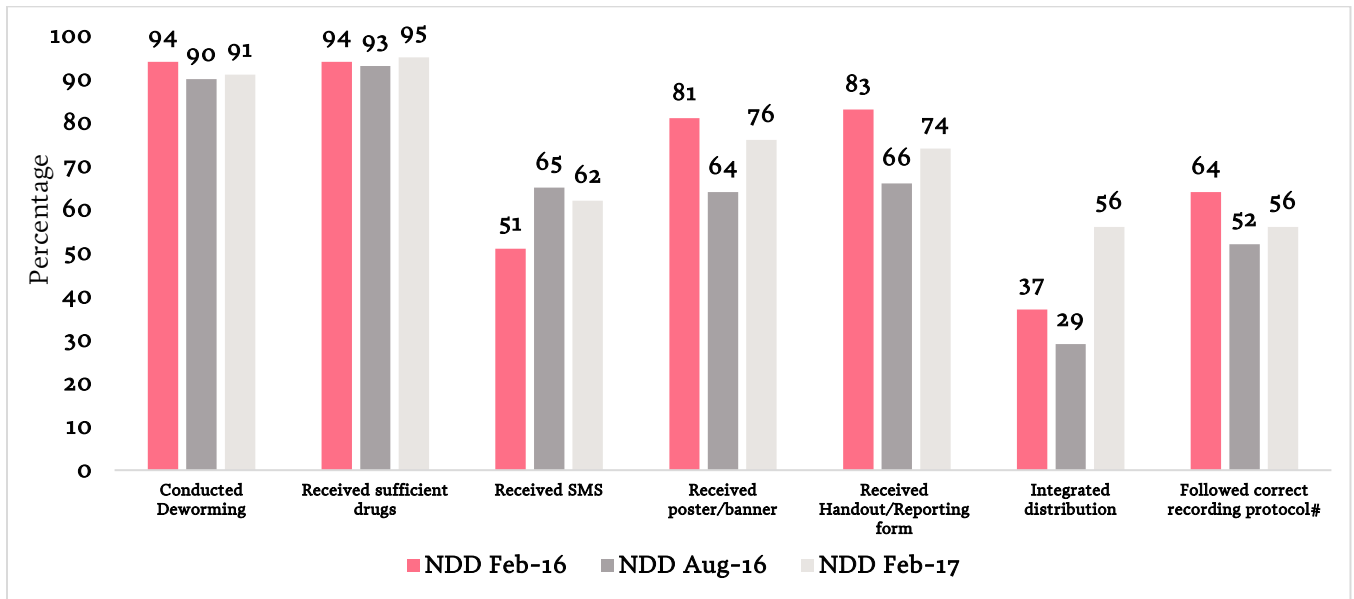
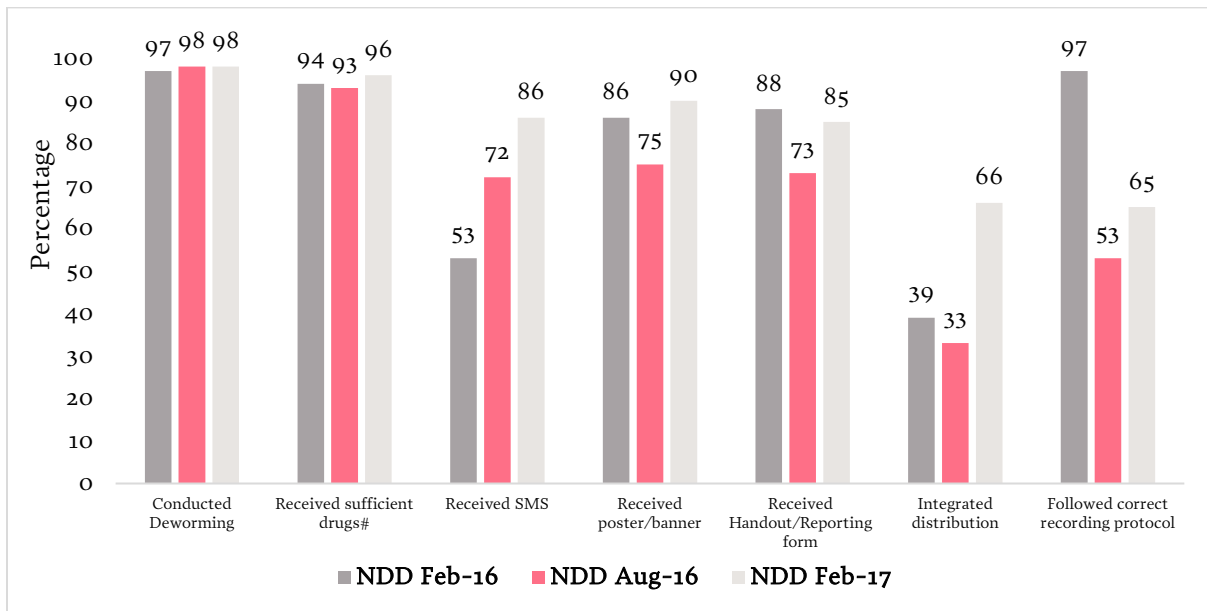


Figure 8: Trend of key indicators in *anganwadis* during the February 2016 and February 2017 NDD rounds



Figures 7 and 8 presents trends in selected indicators during the February 2016 and February 2017 NDD rounds for schools and *anganwadis* respectively. **Figure 7** depicts that indicators such as NDD implementation and receiving a sufficient quantity of drugs remained high across various NDD rounds in the state. The results for *anganwadis* are similar to that of the schools. From August 2016 to February 2017, the percentage of schools that received posters/banners and handouts/reporting forms increased by 12 percentage points and eight percentage points respectively. The increase for *anganwadis* was 15 and 12 percentage points (**Figure 8**). This is due to efforts put forth by NHM to print additional copies of reporting forms for all schools/*anganwadis* to ensure 100% retention of school/*anganwadi* reporting forms. The integrated distribution almost doubled for both schools and *anganwadis* during the February 2017 NDD round compared to the August 2016 NDD round. This increased trend has been due to strengthened efforts by NHM to print IEC and training materials in a timely manner. The integrated distribution was aligned with the cluster level training to ensure greater availability of resources to schools and *anganwadis*.

While the percentage of *anganwadis* that received SMSs increased by 14 percentage points, the percentage of schools that received SMSs declined slightly from 65% in the August 2016 NDD round to 62% in the February 2017 NDD round. The lack of an updated contact database may have impacted the overall delivery of the SMSs to the teachers. Although the percentage of schools and *anganwadis* that followed the correct recording protocol increased from the previous round, its overall level is still low.

3. RECOMMENDATIONS

The independent monitoring exercise conducted during Telangana's NDD round in February 2017 identifies gaps and opportunities to improve and strengthen future NDD 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 August 2016 to February 2017 as evident from the process monitoring data. Participation of teachers needs to be encouraged in the next round of NDD to ensure the successful implementation of a high quality program. The pre-planning of sessions and timely communication of training dates and locations to schools and *anganwadis* will be helpful to improve training attendance. Emphasis on improving training quality and on administering quality assurance tools such as sending training reinforcement messages (SMSs) to promote awareness about worm infections, its prevention, and adverse events management is needed. School teachers and headmasters who attend training must be mandated to impart adequate training to other teachers in the school to encourage improved training quality.

2. Although more than half of the school headmasters received deworming related SMSs, an updated contact database of functionaries across all stakeholder departments will further ensure the maximum reach of reinforcement messages among the school teachers and *anganwadi* workers. This will facilitate comprehensive, effective, and timely dissemination of information to functionaries. For future rounds, all stakeholder departments will be encouraged to follow a systematic mechanism to update the database for the 31 districts.
3. While there were significant improvements in integrated distribution from the August 2016 to the February 2017 round in Telangana, integrated distribution is still low overall and needs to be strengthened with a more focused approach. Most schools and *anganwadis* received training and IEC materials outside of training sessions, revealing poorly integrated distribution. Focused efforts are required to align the distribution cascade (NDD kits) and hand over NDD kits to the teachers/headmasters and *anganwadi* workers at the time of training. Procurement delays and issues around coordinating logistics for drug distribution at block level trainings affected the timely drug procurement and dissemination of training schedules. Reinforcement on integrated distribution during video conferences and through SMS alerts would also be helpful in facilitating integrated distribution.
4. As a substantial proportion of *anganwadi* centers did not have lists of unregistered and out-of-school children, efforts are required to engage ASHAs to prepare these lists in their communities. Greater engagement of ASHAs and AWWs should be encouraged since they conduct community meetings, mobilize children, and conduct health education activities. Emphasis on generating community awareness and mobilizing children will be helpful in achieving high NDD coverage.
5. As findings revealed a low performance of private schools on monitoring indicators, efforts should be given to encourage the participation of private schools in training, facilitating drug logistics, sharing IEC materials, and managing adverse events.
6. Coverage validation findings suggest a low level of adherence to accurate recording protocols. Greater emphasis on recording protocols during training is likely to improve the quality of coverage data in the next round. Training and reinforcement messages shared through SMS needs to have an increased focus on the importance of following correct reporting protocols and maintaining correct and complete documentation. Practical sessions on recording protocols for teachers and *anganwadi* workers can be organized during primary health center (PHC) level trainings.
7. The maximum attendance observed in schools increased from 91% in August 2016 to 94% in February 2017; thus, efforts should be focused on maintaining a high attendance level in order to further achieve high NDD coverage in the state.

8. Coverage validation findings revealed a lesser availability of a copy of reporting forms at schools and *anganwadis*, which directly affects the evaluation of reported coverage data. Along with providing two copies of reporting forms during training, trainers should ensure that teachers/headmasters and *anganwadi* workers understand the directive to maintain a copy of reporting forms.
9. Apart from identified gaps in training attendance, integrated distribution, and engagement of ASHAs in mobilizing out-of-school children in the state, findings also confirm very high (more than 90% of schools and *anganwadis* conducted deworming) NDD implementation in the state. Other states should take lessons from Telangana in managing adverse events and conducting NDD implementation effectively.

4. WAY FORWARD

Program monitoring of the February 2017 round of NDD in Telangana has provided useful insights on opportunities to increase coverage in future NDD rounds, while also identifying gaps in program planning and implementation. Evidence Action will continue to work with the Government of Telangana to coordinate efficient planning for future rounds, strategies for integrated distribution and its supervision, and ways to improve recording and reporting protocol. Further attention needs to be directed on scaling the program in private schools and reaching out-of-school children.

ANNEXURE : 1

Table PM1: 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	252	141	56	248	205	83
Reasons for not attending NDD training (Multiple Response)						
Location was too far away	111	8	8	43	4	9
Did not know the date/timings/venue	111	89	80	43	20	47
Busy in other official/personal work	111	16	14	43	16.	37
Attended deworming training in the past	111	13	12	43	12	28
Not necessary	111	7	6	43	1	2
No incentives/no financial support	111	8	8	43	3	7
Trained teacher provided training to						
All other teachers	141	90	64	NA	NA	NA
Few teachers	141	13	9	NA	NA	NA
No (himself/herself only teacher)	141	24	17	NA	NA	NA
No, did not train other teachers	141	13	9	NA	NA	NA
Awareness about the ways a child can get worm infection	252	235	93	248	232	94
Different ways a child can get worm infection (Multiple Response)						
Not using sanitary latrine	235	172	73	232	144	62
Having unclean surroundings	235	185	79	232	183	79
Consume vegetables and fruits without washing	235	159	68	232	153	66
Having uncovered food and drinking dirty water	235	173	74	232	151	65
Having long and dirty nails	235	157	67	232	154	66
Moving in bare feet	235	147	63	232	141	61
Having food without washing hands	235	166	71	232	200	86
Not washing hands after using toilets	235	140	60	232	153	66
Awareness about all the possible ways a child can get worm infection⁸	235	157	67	232	75	32
Perceive that health education should be provided to children	252	211	84	248	209	84
Knowledge about correct dose of albendazole tablet						

⁸Includes 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	%
1-2 years of children				248	239	96
6-19 years of children	252	234	93	248	242	98
Awareness about non-administration of albendazole tablet to sick child						
Will administer albendazole tablet to sick child	252	11	4	248	9	4
Will not administer albendazole tablet to sick child	252	241	96	248	239	96
Awareness about consuming albendazole tablet						
Chew the tablet	252	244	97	248	240	97
Swallow the tablet directly	252	8	3	248	8	3
Awareness about consuming albendazole in school/<i>anganwadi</i>	252	242	96	248	238	96
Awareness about the last date for submitting the reporting form	252	104	42	248	90	36
Aware that completed reporting form should be submitted to ANM	252	214	85	248	201	81
Awareness to retain a copy of the reporting form post submission	252	203	81	248	210	85
Source of information about current NDD round						
Television	252	126	50	248	108	44
Radio	252	35	14	248	25	10
Newspaper	252	110	44	248	90	36
Banner	252	94	37	248	105	42
SMS	252	140	56	248	168	68
Other school/teacher/ <i>anganwadi</i> worker	252	62	25	248	90	36
Training	252	68	27	248	119	48
Received SMS for current NDD round	252	156	62	248	212	86

Table PM2: Deworming activity, availability of albendazole tablets and list of unregistered 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	252	90	36	248	94	38
Yes, already done	252	73	29	248	111	45
Yes, after sometime	252	50	20	248	28	11
No, will not administer today	252	39	15	248	15	6
Schools/ <i>anganwadis</i> conducted deworming on either of the day⁹	252	221	88	248	243	98
Schools/ <i>anganwadis</i> conducted deworming on NDD¹⁰	124	107	86	125	122	98
Schools/ <i>anganwadis</i> conducted deworming on Mop-Up Day ¹¹	128	106	83	123	111	90
Reasons for not conducting deworming						
No information	31	25	82	5	2	40
Albendazole tablet not received	31	3	9	5	3	60
Apprehension of adverse events	31	1	5	NA	NA	NA
Others ¹²	31	1	4	NA	NA	NA
<i>Anganwadis</i> having list of unregistered/out-of-school children	NA	NA	NA	248	156	63
Albendazole was administered to out-of-school children	NA	NA	NA	233	172	74
Albendazole was administered to unregistered children	NA	NA	NA	233	184	79
Sufficient quantity of albendazole tablets¹³	218	206	95	240	231	96

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

¹⁰Based on the samples visited on National Deworming Day only.

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

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

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

Table PM3: Integrated distribution of albendazole tablets and IEC materials, February 2017

Items	Schools				<i>Anganwadi</i>			
	Received (N=252)	Denominator *	Received in training	Verified	Received (N=248)	Denominator *	Received in training	Verified
Albendazole tablet	86 (218)	218	89 (195)	99 (216)	97 (240)	240	86 (207)	98 (236)
Poster/banner	76 (192)	192	89 (171)	98 (187)	90 (224)	224	89 (199)	97 (218)
Handouts/reporting form	74 (185)	185	87 (160)	93 (170)	85 (211)	211	85 (179)	94 (195)
Received all materials	67 (168)	252	85 (142)	93 (155)	80 (199)	248	82 (164)	93 (185)
Integrated distribution¹⁴	56 (142)				66 (164)			

Note: The denominator for item “received” is 252 for schools and *anganwadis* 248; Numerators for “received in training” and “verified” are given in parentheses; *Indicates common denominator for “received in training” and “verified.”

Table PM4: Implementation of deworming activity and observation of monitor's, February 2017

Indicators	Schools			<i>Anganwadi</i>		
	Denominator	Numerator	%	Denominator	Numerator	%
Deworming activity was taking place	213	172	81	233	193	83
Albendazole tablets were administered by						
Teacher/headmaster	90	53	59	NA	NA	NA
<i>Anganwadi</i> worker	NA	NA	NA	94	69	73
ASHA	NA	NA	NA	94	10	11
ANM	NA	NA	NA	94	7	7
Followed any recording protocol¹⁵	163	140	86	205	181	88
Protocol followed						
Putting single/double tick	140	114	82	181	144	79
Put different symbols	140	8	5.8	181	16	9
Prepare the separate list for dewormed	140	18	12.7	181	22	12
Visibility of poster/banner during visits	192	173	90	224	191	85

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.

¹⁵Any 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 PM5: 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 taking albendazole tablet	252	100	40	248	109	44
Knowledge of possible adverse events						
Mild abdominal pain	100	83	83	109	87	80
Nausea	100	51	51	109	55	51
Vomiting	100	85	85	109	81	74
Diarrhea	100	31	31	109	36	33
Fatigue	100	39	39	109	45	41
All possible adverse event ¹⁶	100	15	15	109	20	18
Awareness about mild adverse event management						
Make the child lie down in open and shade/shaded place	252	179	71	248	192	77
Give ORS/water	252	160	64	248	170	69
Observe the child at least for 2 hours in the school	252	124	49	248	122	49
Don't know/don't remember	252	30	12	248	11	4
Awareness about severe adverse event management						
Call PHC or emergency number	252	203	81	248	203	82
Take the child to the hospital /call doctor to school	252	154	61	248	169	68
Don't know/don't remember	252	12	5	248	2	1
Occurrence of cases of any adverse event	163	33	20	205	27	13
Available contact numbers of the nearest ANM or MO-PHC	252	221	88	248	237	96

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 PM6: Selected Indicators of Process Monitoring in Private Schools, February 2017

Indicators ¹⁷	Denominator	Numerator	%
Attended training for current round of NDD	73	25	34
Received albendazole tablets	73	46	63
Sufficient quantity of albendazole tablets	46	45	98
Received poster/banner	73	35	48
Received handouts/ reporting form	73	34	47
Received SMS for current NDD round	73	29	40
Albendazole administered to children	73	44	60
Reasons for not conducting deworming			
No information	26	22	87
Albendazole tablets not received	26	2	7
Apprehension of adverse events	26	1	1
Others ¹⁸	26	1	5
Albendazole tablet administered to children by teacher/headmaster¹⁹	16	4	22
Perceive that health education should be provided to children	73	52	72
Knowledge about correct doses of albendazole tablet	73	63	86
Awareness about non-administration of albendazole tablet to sick child	73	69	95
Opinion of occurrence of an adverse event after taking albendazole tablet	73	29	40
Opinion of occurrence of possible adverse events			
Mild abdominal pain	29	26	89
Nausea	29	22	75
Vomiting	29	27	93
Diarrhea	29	7	24
Fatigue	29	15	50
Occurrence of cases of any adverse event	32	5	15
Let the child rest in an open and shaded place	73	39	53
Provide clean water to drink/ORS	73	42	58
Contact the ANM/nearby PHC	73	55	76
Available contact numbers of the nearest ANM or MO-PHC	73	51	70
Followed correct²⁰ recording protocol	24	21	87

¹⁷These 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

¹⁸School administer the albendazole tablet to children a day before holiday, children/student absent, postponed due to festival

¹⁹This indicator is based on samples where deworming was ongoing.

²⁰Correct recording protocol implies putting single tick (✓) on NDD and double tick (✓✓) for all those children administered albendazole tablets.

Table CV1: Findings from Schools and *Anganwadis* Coverage Validation Data

Indicators	Schools			<i>Anganwadis</i>		
	Denominator	Numerator	%	Denominator	Numerator	%
Conducted deworming ²¹	625	567	91	625	610	98
Day of albendazole administration (Multiple Response)						
National Deworming Day	567	550	97	610	593	97
Mop-Up Day	567	419	74	610	453	74
Between NDD and Mop-Up Day	567	43	8	610	62	10
Reasons for not conducting deworming						
No information	58	22	38	15	9	60
Drugs not received	58	14	24	15	4	27
Apprehension of adverse events	58	14	24	15	0	0
Others ²²	58	8	14	15	2	13
Albendazole left after deworming	567	264	47	610	304	50
Number of albendazoles left						
Less than 50 tablets	264	220	83	304	292	96
50-100 tablets	264	39	15	304	5	2
More than 100 tablets	264	5	2	304	7	2
Copy of reporting form was available for verification	567	286	50	610	267	44
Reasons for non-availability of copy of reporting form						
Did not received	281	37	13	343	25	7
Submitted to ANM	281	238	85	343	306	89
Unable to locate	281	5	2	343	8	3
Other ²³	281	1	0	343	4	1
<i>Anganwadis</i> having list of unregistered children	NA	NA	NA	610	217	36
<i>Anganwadis</i> having list of out-of-school children	NA	NA	NA	610	119	20

²¹ Schools and *anganwadis* that conducted deworming on NDD or Mop-Up Day.

²² Other includes mainly parent objection, non-availability of headmaster or *anganwadi* worker.

²³ Other includes mainly availability of blank form.

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

Indicators	School			<i>Anganwadis</i>		
	Denominator	Numerator	%	Denominator	Numerator	%
Followed correct ²⁴ recording protocol	567	317	56	610	393	65
Followed partial ²⁵ recording protocol	567	91	16	610	93	15
Followed no ²⁶ recording protocol	567	159	28	610	124	20
State-level verification factor ²⁷	49878	28750	0.58	18239	13892	0.76
<i>Anganwadi</i> registered children	NA	NA	NA	12036	8857	0.74
<i>Anganwadi</i> unregistered children	NA	NA	NA	3380	3477	1.03
Out-of-school children	NA	NA	NA	2823	1558	0.55
State-level inflation rate ²⁸	28750	21128	73	13892	4347	31
<i>Anganwadi</i> registered children	NA	NA	NA	8857	3179	36
<i>Anganwadi</i> unregistered children	NA	NA	NA	3477	-97	-3
Out-of-school children	NA	NA	NA	1558	1265	81
Attendance on previous day of NDD	107716	85567	79	NA	NA	NA
Attendance on NDD	107716	88692	82	NA	NA	NA
Attendance on Mop-Up Day	107716	76277	71	NA	NA	NA
Children who attended on both NDD and Mop-Up Day	107716	63505	59	NA	NA	NA
Maximum attendance of children on Deworming Day and Mop-Up Day ²⁹	107716	101464	94	NA	NA	NA
School level inflation rate for schools followed the correct recording protocol	26567	4715	18	NA	NA	NA
Estimated NDD coverage based on government coverage Data ³⁰	56			71		

²⁴ 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.

²⁵ 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.

²⁶ No protocol includes all those schools where none of the classes followed any protocol to record the information of dewormed children.

²⁷ Ratio of recounted value of the dewormed children to the reported value. This calculation is based on only those schools (n=286) and *anganwadis* (n=267) where deworming was conducted and copy of reporting form was available for verification.

²⁸ Proportion of over reported dewormed children against total verified children in schools and *anganwadis*. For *anganwadi* unregistered children total no of verified children are higher than the reported which imply that numbers are under-reported against verified children. Also for the same group of children inflation rate is negative, which indicates deflation due to under-reported children against verified children.

²⁹ 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.

³⁰ This was estimated by implying state-level verification factor on government reported coverage for school and AWC

Estimated NDD coverage based on School attendance ³¹	73	NA
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Table CV3: Indicators based on interview of children during coverage validation in school

Indicators	Denominator	Numerator	%
Children received Albendazole tablets	1700	1608	95
Children consumed Albendazole tablet	1608	1601	99
Children aware about the Albendazole tablets	1608	1527	95
Source of information about NDD round			
Teacher/school	1527	1445	95
Television	1527	517	34
Radio	1527	235	15
Newspaper	1527	476	31
Poster/Banner	1527	573	38
Parents/siblings	1527	200	13
Friends/neighbors	1527	149	10
Way children consumed the tablet			
Chew the tablet	1601	1526	95
Swallow tablet directly	1601	75	5
Supervised administration of tablets	1601	1444	90

³¹ This was estimated on the basis of 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*.