

Evidence
Action



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

REPORT
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1. EXECUTIVE SUMMARY

The World Health Organization (WHO) estimates that more than 1.5 billion or 24% of world's population infected with soil-transmitted helminth (STH) infections worldwide. Over 270 million preschool-age and over 600 million school-age children live in areas of intensive worm transmission, and face physical, nutritive and cognitive impairment as a result of preventable STH infection. In 2001, WHO developed a strategy to control worm infection and recommended periodic mass deworming for all people living in endemic areas¹.

India has an estimated 220 million children living with STH infection - almost one quarter of the global burden. In order to combat the high prevalence of STH, the Government of India launched National Deworming Day (NDD) program as a part of National Health Mission in February, 2015 to deworm all the children between 1-19 years of age. The program aims supervised administration of albendazole tablets to all children of preschool and school-age, in *anganwadis* and schools, including unregistered (1-5 years) and out-of-school (6-19 years) children, in *anganwadis*. Contributing to this national effort, Bihar implemented its fifth round of school-based deworming in all 38 districts of the state on **February 10, 2016** followed by mop-up day (MUD) on **February 15, 2016**. Evidence Action's Deworm the World Initiative, as the technical assistance partner, facilitated planning and implementation of the deworming round in the state.

Evidence Action engaged an independent research agency to provide process monitoring on both deworming day and mop-up day to assess the preparedness of *anganwadis* and schools to implement the mass deworming program, followed by coverage validation to evaluate accuracy of the reporting data and coverage estimates post deworming. Due approvals for the survey were obtained from Departments of Health & Family Welfare, Education, and Women & Child Development, Government of Bihar.

On National Deworming Day and mop-up day, 130 monitors visited 263 randomly selected government, government-aided, and private schools, and 250 *anganwadis* to observe the ongoing deworming activity. Coverage validation was undertaken February 20-26, 2016 during which 130 monitors visited 405 randomly selected government, government-aided, and private schools and 375 *anganwadis* to verify their reported treatment figures. Findings from independent monitoring highlighted that around 93% of schools and 95% of the *anganwadis* observed deworming on NDD and MUD. Approximately 86% of schools and 91% of *anganwadis* reported to receive sufficient drugs for deworming. Around 77% of schools and 75% of *anganwadis* received program posters and banners. However, integrated distribution of NDD kits was relatively low for both schools (37%) and *anganwadis* (39%). 80% of schools and 84% of *anganwadis* received training for recent round of deworming. However, there was low participation from private schools in the training and only five out of 13 private schools reported being trained within the last two months. Awareness of the causes of worm infection, possible adverse events, and adverse event protocols was high among teachers and *anganwadi* workers.

High compliance with procedures and protocols was observed across schools and *anganwadis* in the state. Almost all school principals, teachers, and *anganwadi* workers were able to accurately mention at least one of the symptoms of adverse events. Although the basic knowledge of processes for

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

management of adverse events was high, very few teachers and *anganwadi* workers had awareness of adverse event reporting protocols. Cases of any adverse events were reported in around 11% of schools and 8% of *anganwadis*.

Coverage validation data revealed that around 62% of schools and 90% of *anganwadis* followed correct protocols for recording the number of children dewormed. However, around 18% of schools did not adhere to any recording protocol. A substantial proportion of *anganwadi* workers did not have a list of unregistered preschool-age children (55%) and out-of-school children (47%). In spite of substantial compliance with recording protocols, coverage validation data for school enrolled children exhibited high overall inflation (31%; verification factor of 0.76) of treatment figures. Nevertheless, interviews indicated that 96% of all enrolled children received a deworming tablet.

The monitoring exercise conducted during Bihar's fifth round of school-based deworming also highlights opportunities to strengthen future rounds. As training is a critical component of the program, quality and coverage of the program can be improved in future rounds by ensuring timely communication of training dates to schools and *anganwadis*. Improved attendance of school teachers would enable effective program implementation in schools. The database of functionaries across all stakeholder departments needs to be regularly updated and strengthened to ensure information dissemination is reaching the key audience in a timely manner to allow for action as needed. Efforts are also required to ensure that those teachers who attend training also impart adequate training to other teachers in the school. Further, efforts are needed to strengthen the integrated distribution of deworming kit in the training. Integrated distribution would enable more widespread use of IEC materials for community mobilization and awareness, potentially improving the reach of the program. In addition, tracking the distribution cascade to identify and fill gaps in a timely manner will likely improve the availability of IEC materials. Increased engagement of ASHAs and AWWs is also critical for the success of program. Utilizing incentives approved by the national government for ASHA workers will provide motivation to these workers to conduct activities for community engagement. Moreover, as most of the *anganwadi* centers did not have the list of out of school and non-registered 1-5 years children, efforts are required to proactively engage ASHAs to prepare the list of these children in the community. Schools and *anganwadis* should be encouraged to retain a copy of school and *anganwadi* reporting forms after submission. The high levels of reporting inflation suggest that additional efforts are needed to increase accuracy of program coverage reporting, including an increased emphasis on the importance of reporting protocols during training, in IEC materials, and through training reinforcement SMSs.

2. MONITORING AND EVALUATION

2.1 Study Background

Understanding program reach and quality is a key component of a successful deworming intervention. In order to fulfill this need, Evidence Action worked intensively with Bihar's health, education, and women & child development departments to assess the quality of program planning and implementation with an ultimate focus of making improvements in future rounds. The preparedness of schools, *anganwadi* centers (AWCs) and health systems to undertake deworming; adherence to the prescribed deworming processes; and ensuring accurate coverage reporting are key components of the supervision process. Three components of monitoring and evaluation are

included in each deworming program round: (1) process monitoring, (2) coverage reporting and (3) coverage validation.

2.2 Process Monitoring, Coverage Reporting, and Coverage Validation

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

Coverage Reporting assesses the estimated number of program beneficiaries, and is a crucial component to measure success. With close support from Evidence Action's state and field teams, the Department of Health collected and compiled the coverage report for NDD within the established reporting timelines. School teachers and *anganwadi* workers had been trained on the recording and reporting protocols. These protocols, along with the reporting cascade and timelines (refer to Figure A below), were shared with all districts through the state's directives. In order to improve the accuracy of coverage reporting by the schools and *anganwadis*, every participating school and *anganwadi* was instructed to follow a recording protocol for deworming. Every teacher and *anganwadi* worker was required to put a single tick mark (✓) next to a child's name in the attendance register if they received albendazole on deworming day, and a double-tick mark (✓✓) if received on mop-up day. These tick marks are the basis for the numbers reported by every school and *anganwadi*. Schools and *anganwadis* provided the number of enrolled/registered children dewormed by counting the single and double tick marks in the registers. Headmasters and *anganwadi* workers compiled the number of dewormed children from attendance registers, filled out the summary reporting format, and submitted it to the next level.

Figure A: Reporting cascade and timelines

School/Village level reporting Date : February 19, 2016	<ul style="list-style-type: none"> •Teachers/ HM will submit completed formats to CRC. •<i>Anganwadi</i> workers will submit completed formats to ANM
Cluster level reporting Date: February 19, 2016	<ul style="list-style-type: none"> •CRC will compile the formats and submit to BEO •ANM will compile the formats and submit to MOIC
Block level reporting Date: March 10, 2016	<ul style="list-style-type: none"> •BEO will aggregate the reports to the DEO/DPO •MOIC will aggregate the reports to the Civil Surgeon
District level reporting Date: March 17, 2016	<ul style="list-style-type: none"> •DEO/DPO will aggregate the report and submit to Civil Surgeon •Civil surgeon will aggregate the report and submit to the State Health Department
State level reporting Date: March 29, 2016	<ul style="list-style-type: none"> •The State Health Department will aggregate final report for school and <i>anganwadi</i> and submit to MoHFW

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

2.3 Sampling and Sample Size

Through a competitive selection process, Evidence Action hired an experienced independent research agency, Karvy Insights Limited, to implement monitoring across 125 blocks in all 38 districts of the state. A two-stage probability sampling procedure was adopted to select schools for process monitoring and schools and *anganwadis* for coverage validation (Table A). For process monitoring, *anganwadis* near sampled schools were selected. Process monitoring was carried out on two days: NDD (February 10, 2016) and mop-up day (February 15, 2016). On each day, 125 monitors aimed to visit 125 randomly selected government/government aided schools and 125 nearby *anganwadis* to observe deworming. Coverage validation was undertaken from February 20-26, 2016 during which 125 monitors targeted to visit 375 randomly selected government/government aided schools, and 375 *anganwadis* to verify the reported coverage numbers. Additionally five monitors visited ten private schools on NDD and mop-up day, and 30 private schools during coverage validation.

Process information was collected to check for adequacy of drug supplies and awareness materials; assess whether teachers had received training; and check knowledge of adverse event management and reporting protocols. During coverage validation monitors collected information by interviewing

school headmaster/teacher, *anganwadi* workers, checking attendance registers, and interviewing three children from each school.

Table A: Target and Coverage of schools and *anganwadis* during Independent monitoring

Indicators	Process monitoring		Coverage validation	
	Target	Achieved	Target	Achieved
Total number of districts	38	38	38	38
Total number of blocks	125	125	125	125
Total number of schools	270	263	405	405
Total number of government/government aided schools	250	251	375	375
Total number of private schools	20	12	30	29
Total number of children interviewed in schools	270	263	1215	1215
Total number of <i>anganwadis</i>	250	250	375	375

2.4 Independent Monitoring Formats

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

2.5 Authorization from Government

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

2.6 Training of Trainers and Independent Monitors

A two-phase training program was organized at the state level. In the first phase, representatives from Evidence Action provided a one-day comprehensive training to 15 master trainers of Karvy Insights in Patna on February 6, 2016. These master trainers conducted a two-day training of 140 monitors during February 5-6, 2016 in batches of 50-55 monitors, supervised by Evidence Action. A total of 170 trainees participated, including 20 buffer monitors and 10 supervisors.

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

2.7 Field Implementation

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

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

2.8 Quality Control

Appropriate quality control measures were taken to ensure data collected was accurate and comprehensive. Approximately 15% of schools and *anganwadis* were contacted over the phone the next day to confirm that they had participated in monitoring and validation. In addition, district coordinators visited sampled schools to spot check the monitoring processes and tele-callers contacted schools and *anganwadis* to verify monitoring visits. In all cases, school and *anganwadi* staff were asked to sign a participation form and provide an official stamp, verifying that the school or *anganwadi* was actually visited. The data synced to tablets was vetted as quickly as possible to ensure comprehensiveness, and errors were subsequently addressed by follow up visits or calls.

3. KEY FINDINGS

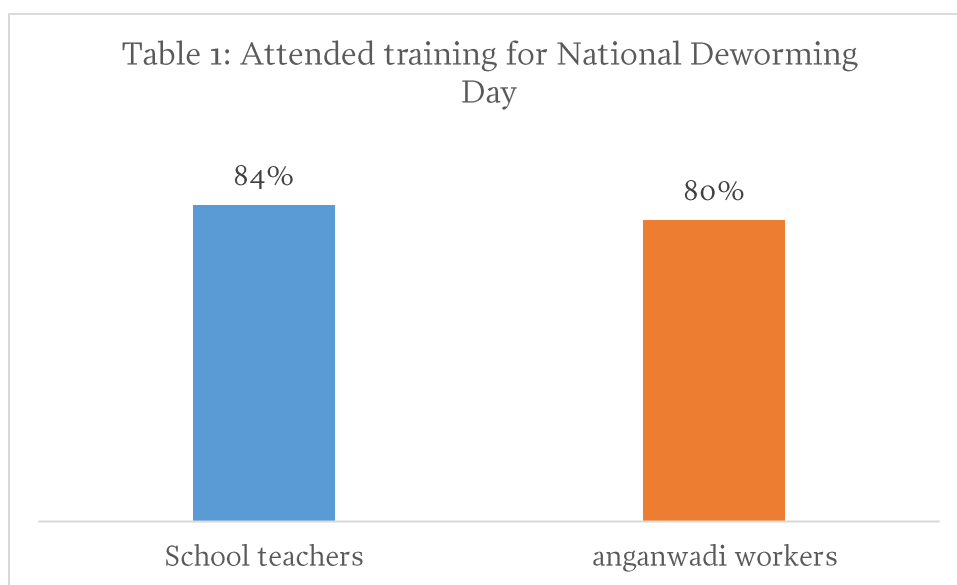
Key results from independent monitoring are provided below, with further details shared in annexures.

3.1 Training

For effective implementation of NDD, teachers and *anganwadi* workers are trained prior to the deworming day. Independent monitoring data demonstrated that teacher/ headmasters from 84%

of schools and 80% of *anganwadi* workers received training for the deworming round² (Figure 1). Among those who did not attend training, the majority of teachers (49%) and *anganwadi* workers (61%) cited unawareness about the date and time of training as the main reason. (Annexure 1-Table 1). Approximately 40% of schools and *anganwadis* reported that they did not receive an SMS about deworming, indicating one of the probable reasons for limited participation of schools in training for deworming program. Additionally, even in schools where a headmaster/teacher attended training, around 23% did not provide training to other teachers in the school. (Annexure 1-Table 1).

In contrast to high participation from government schools in training, only five out of 13 private schools covered reported to have attended the training for recent round of deworming. Four out of these five trained teachers reported to have trained to other teachers in the school. Amongst the private schools, the major reason cited for not attending the training was lack of awareness of date and time of training. Only five of the 13 private schools covered in the study were aware of the possibility of adverse events occurring during deworming. Eight out 13 private schools reported to have received an SMS about deworming highlighting substantial dissemination of information about the program in private schools through SMS.



3.2 Integrated Distribution of Deworming Materials Including Drugs

As per NDD guidelines, there should be an integrated distribution³ process, providing all necessary IEC materials along with deworming tablets to schools and *anganwadi* centers at Block level training.

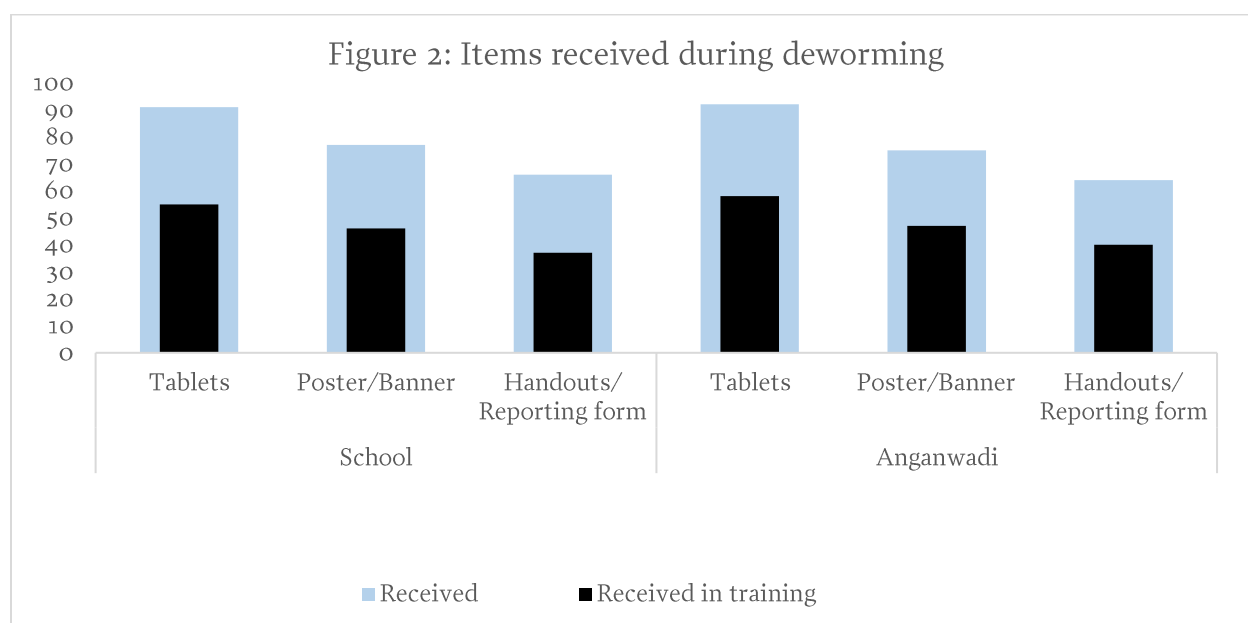
² Findings from both process monitoring and coverage validation were grouped together for this indicator.

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

Despite the well-defined NDD kit and integrated distribution cascade, findings from independent monitoring demonstrate that only 37% of schools and 39% of *anganwadis* in the state had integrated distribution of deworming materials, highlighting large distribution of deworming materials on individually in trainings (**Annexure 1-Table 1**).

Around 91% of schools and 92% of *anganwadis* received tablets for deworming however, only 55% of schools and 58% of *anganwadis* received tablets in training (**Figure 2 & Annexure 1-Table 2**). Moreover, 86% of schools and 91% *anganwadis* reported to have received sufficient drugs for deworming (**Annexure 2-Table 1**). 77% of schools and 75% of *anganwadis* received poster/banners whereas, around 46% of schools and 47% of *anganwadis* received banner/posters in training. About 66% of schools and 64% of *anganwadis* received handouts/reporting forms, out of which 37% of schools and 40% of *anganwadis* received it in the training (**Figure 2 & Annexure 1-Table 1**).

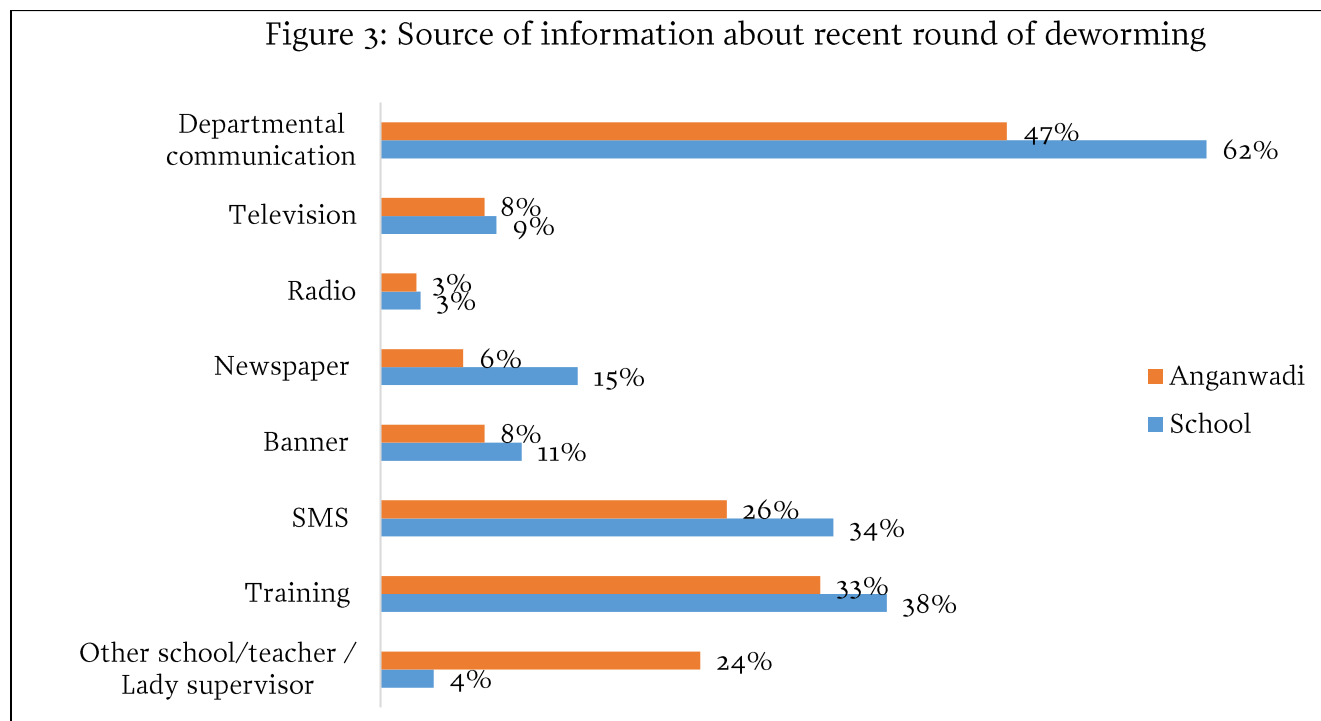
10 out of 13 private schools covered in the study received tables for deworming, eight schools received banner/poster and handouts each. Further, half of these schools reported to receive these items in training. Moreover, during coverage validation, 22 out of 29 private schools reported to have received sufficient quantity of deworming tablets.



3.3 Source of Information about Recent Round of Deworming

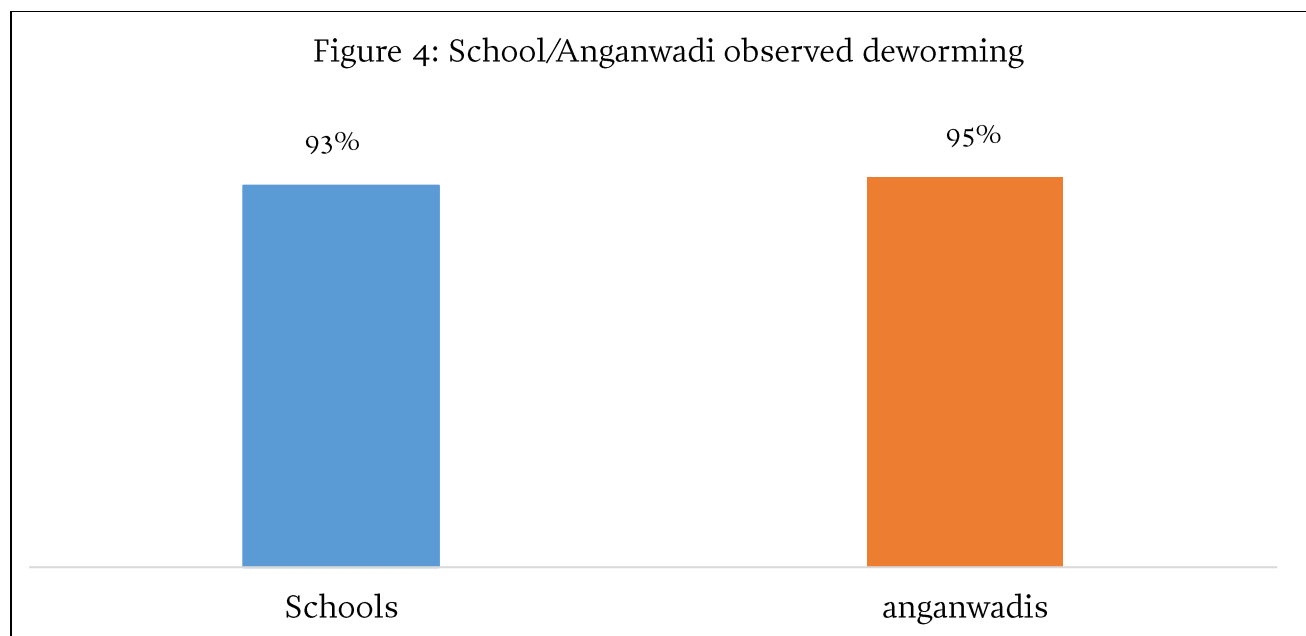
Departmental communication was the major source of information for the schools (62%) and *anganwadis* (47%) for deworming (**Figure 3**). This was followed by training (38%) for schools and *anganwadis* (33%). SMS and television were sources of information for approximately 20% and 26% of schools and *anganwadis* respectively (**Figure 3 & Annexure 1-Table 1**). Departmental communication was also the primary source of information for five out of 13 private schools. All children interviewed in private schools reported to have received the tablet. Thirteen of the 15 children interviewed were aware about deworming activity.

Most children reported their primary source of information about deworming to be verbal instructions and explanation from their teacher (94%), followed by the banner/poster (23%). Around 7% of children received information about deworming from their parents (Annexure 1-Table 5).



3.4 Implementation of Deworming

Independent monitoring data depicted that around 87% of schools and 88% of *anganwadis* reported to conduct deworming on the day of visit; however, monitors observed ongoing deworming activity in 83% of schools and 89% of *anganwadis* respectively (Annexure 1-Table 1 & 3). Further, coverage validation demonstrated that 93% of schools and 95% of *anganwadis* had dewormed during deworming or mop-up day (Figure 4 & Annexure 2-Table 1). Out of the total enrolled children who were interviewed on deworming day and mop-up day, around 95% reported receiving a tablet on one of these days. Prima facie, this suggests that deworming occurred in a large proportion of schools and *anganwadis* on one of the deworming days (Annexure 1-Table 5). Eight out of the 13 monitored private schools observed deworming on both NDD and mop-up day. During coverage validation, 27 of the 30 sampled private schools observed deworming on NDD and mop-up day.

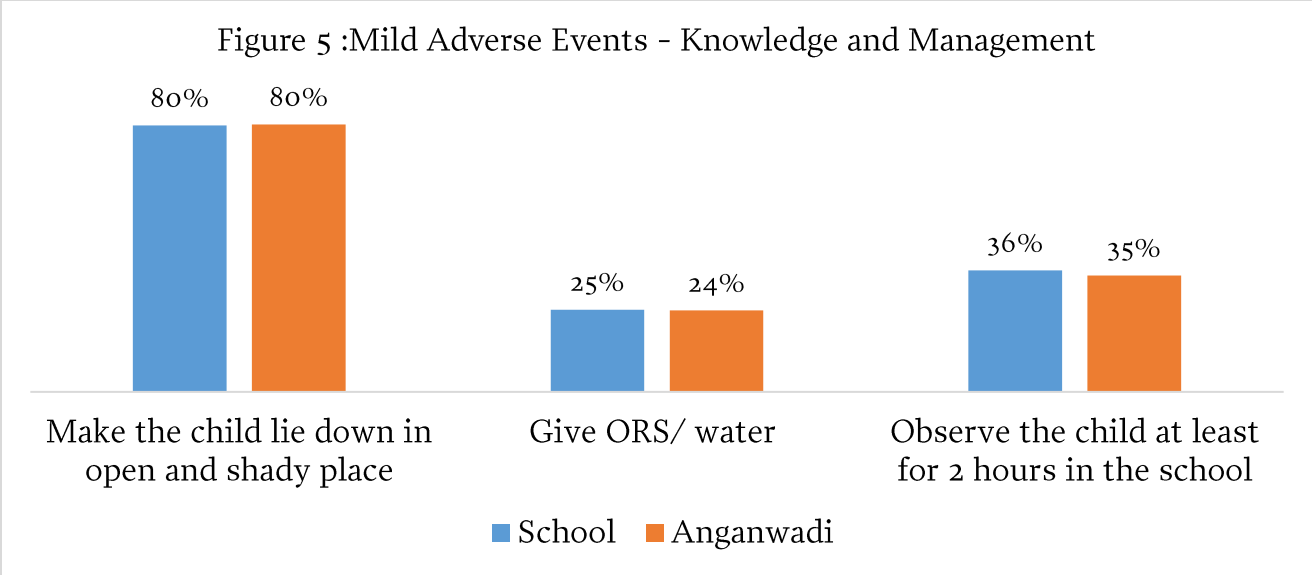


3.5 Adverse Events - Knowledge and Management

Interviews with headmasters and senior teachers revealed low of awareness regarding potential adverse events but substantial understanding of appropriate protocols to follow in case of such events among the school headmasters and *anganwadi* workers. Only 35% of headmasters/principals and 25% of *anganwadi* workers acknowledged that adverse events were possible after ingesting albendazole. Around 89% of schools and 83% of *anganwadi* workers asked children if they were sick before administering tablets, and 83% of schools and *anganwadi* workers did not administer tablets to a sick child (**Annexure 1-Table 3**). Vomiting was listed as a symptom by 70% of headmaster/teachers and 80% of *anganwadi* workers followed by abdominal pain which was listed by 61% of principals and 72% of *anganwadi* staff. Around 55% of headmasters and *anganwadi* workers reported nausea as another symptom (**Annexure 1-Table 1**). Further, around 78% of school teachers and 85% *anganwadi* workers knew to have a child lie down in an open, shady place in case of any symptoms and the majority of schools and *anganwadis* knew to give ORS/water and observe for two hours (**Figure 5**). Moreover, 69% of schools and 64% of *anganwadis* reported the need to call a PHC doctor if symptoms persisted (**Annexure 1-Table 1**).

The high proportion of teachers and *anganwadi* workers who listed adverse event symptoms, and describe response protocols, suggest that schools and *anganwadis* have substantial awareness about the processes to be followed. Almost all interviewed teachers listed at least one symptom and one measure to be followed in case of an adverse event. Cases of any adverse event was observed in 11% of schools and around 8% of *anganwadis* (**Annexure 1-Table 3**).

Five out of the 13 sampled private schools were aware of the possible adverse events that could be reported by children after taking the tablet and accurately mentioned at least one symptom. Vomiting and abdominal pain were the most frequently reported symptoms. Three of the private schools reported to have a child lie down in an open, shady place in case of any symptom. No cases of any adverse event was observed in private schools on NDD or mop-up day.



3.6. Recording Protocol

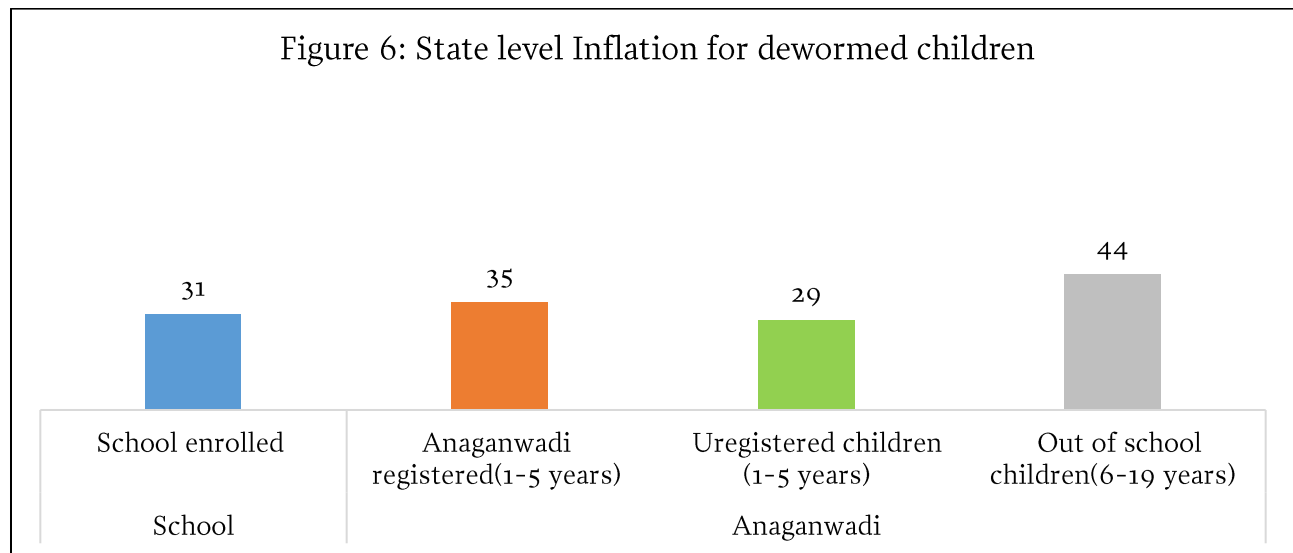
Coverage validation data (Annexure 2-Tables 2 & 4) demonstrated that 62% of schools and 90% of anganwadis followed correct recording protocols, while 18% of schools did not adhere to any recording protocol and the remaining 20% schools followed recording protocol partially (Annexure 2-Table 2). During training, teachers and *anganwadi* workers were instructed to retain a copy of school/*anganwadi* reporting forms; however, 15% of headmasters and 21% of *anganwadi* workers interviewed during process monitoring were not aware of this requirement (Annexure 1-Table 1). During coverage validation, reporting forms were available in only 61% of schools and 55% of *anganwadis*. Further, as per NDD guidelines, ASHAs were required to prepare a list of the children not attending schools and *anganwadis* and submit it to *anganwadi* workers to increase coverage of these children in *anganwadi* centers; however, findings suggest that only 43% and 46% of *anganwadis* had lists of out-of-school (6-19 years) and unregistered (1-5 years) children respectively (Annexure 1-Table 1).

3.7 Coverage Validation

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

The verification factor was estimated on the basis of availability of a copy of reporting forms at schools and *anganwadis*. As mentioned in the previous section, only 61% of schools and 55% of *anganwadis* had a copy of the reporting form available after deworming and mop-up day. The state

level verification factor for enrolled children was 0.76, indicating that for every 76 enrolled children who were recorded as dewormed in schools, the school reported that 100 enrolled children had been dewormed (Figure 6 & Annexure 2-Table 2). This corresponds to an overall 31% inflation of reporting in the state, meaning that reported numbers appear to be approximately 31% higher than the numbers recorded in attendance registers. Similarly, the state level verification factors for *anganwadi* registered children, non-registered (1-5 years) and out-of-school (6-19 years) children were 0.74, 0.77 and 0.69 with corresponding inflation of 35%, 29%, and 44% respectively (Figure 6 & Annexure 2-Table 4). Training was found to increase the accuracy of reporting. However, inflation was observed significantly high among trained schools too: trained schools had 30% inflation in reporting, while untrained schools had 70% inflation in reporting (Annexure 2-Table 2).



Further, attempts were made to understand the maximum number of enrolled children that could have been dewormed. Coverage validation demonstrated that 93% of schools did deworming on either of the days and attendance data showed that 74% of the total school enrolled children were in attendance (Annexure 2-Table 2). Moreover, 95% of children interviewed during coverage validation reported to have received deworming tablet and 96% of them consumed it under the supervised administration in schools (Annexure 2-Table 3). Based on deworming implementation status and attendance of enrolled children on deworming and mop-up day and children’s interview, a maximum of 65% of children (95% children out of 74% present in 93% of schools conducted deworming) could have been dewormed in the state.

4. RECOMMENDATIONS

Since the program follows a fixed-day approach and engages multiple stakeholders, it is critical that all program components are aligned for successful program implementation and to prevent gaps and delays. Of particular importance are training, drug logistics, IEC materials, and correct recording and reporting protocols. Following are the key recommendations for program improvements emerging from the state’s experiences with NDD 2016.

- 1) In coordination with all the stakeholder departments, consensus on fixing target population would be helpful to assess the extent of coverage and expanding reach to children not attending schools and *anganwadis*.
- 2) Training is a critical component of the program. Findings suggest that in comparison to previous round of NDD, training awareness has improved, but greater emphasis still could be placed on communicating training schedule and venue information by block officials' communications to the schools and *anganwadis*. Improving attendance at trainings will likely benefit the distribution cascade as well, since drugs and materials are distributed during trainings.
- 3) As a substantial proportion of school headmasters and *anganwadi* workers did not receive deworming related SMS during NDD, the contact database of functionaries across all stakeholder department needs to be regularly updated and strengthened to ensure comprehensive information dissemination and reaching concerned officials/functionaries in a timely manner. The database of block level functionaries and teachers/schools needs to be regularly updated and strengthened to ensure that program information can be disseminated to key audiences in a timely manner. This would likely help ameliorate the problems of absenteeism at trainings due to poor communication about training dates, and limited reach of training reinforcement messages to teachers and *anganwadi* workers via SMS.
- 4) Findings suggest a need to strengthen integrated distribution of training, IEC materials, and drugs during block level trainings. While the state planned the bundling process far in advance of NDD, less than one-fourth of teachers and *anganwadi* workers reporting receiving all materials at the trainings. Improvements can be made to ensure that bundling and timely distribution is done at all levels down to the blocks, where the implementers receive materials.
- 5) Intensive efforts towards generating community awareness and mobilizing children is critical to achieve high coverage. For instance, parents and siblings may be targeted with specific community mobilization activities to increase coverage of out-of-school children. More engagement of ASHAs and AWWs should be encouraged, since they conduct community meetings, mobilize children, and conduct health education activities. Providing ASHAs with incentives, as approved by the national government, will motivate them to conduct activities for community engagement. Further, as most *anganwadi* centers did not have the list of out-of-school and non-registered children, efforts are required to engage ASHAs proactively to prepare these lists in their communities.
- 6) Coverage validation data, as well as differences in reporting between trained and untrained schools, suggest that a greater emphasis on recording protocols will improve the quality of coverage data in the future rounds.
- 7) The high levels of reporting inflation suggest that additional efforts are needed to increase accuracy of program coverage reporting, including increased emphasis on reporting protocols in trainings, IEC materials, and reminder SMS. Moreover, given the high inflation in reporting in both schools and *anganwadis*, it is imperative to undertake data quality assessments (DQA) to understand the administrative and reporting challenges with program data management.
- 8) Since this was the first round for the state to engage private schools in deworming, participation was low and can be increased in the future. In order to broaden the reach of the

program, it is critical to engage with private schools much ahead of time to garner participation in every aspect of future rounds. Comprehensive training for teachers and other staff, along with adequate and timely information about the program, may help generate awareness and interest from private schools.

5. WAY FORWARD

The success of the program is evident from the significant reach made to deworm preschool-age children under ambit of National Deworming Day for the first time in history of program, which so far since last four rounds was focused on deworming school-age children. Continued engagement with relevant stakeholders such as the Department of Women and Child Development will be crucial to further strengthen the program's fixed day approach and prepare for the biannual round in August 2016. The commitment of Government of Bihar to further expand the program's reach to children enrolled in private schools, although in pilot phase, reflects the sustained interest of stakeholders for extending deworming treatment to all children ages 1-19. The learnings emerging from private school engagement in this round will be crucial to inform program strategies to strengthen coordination with the private school in the future rounds. Strengthened planning for the biannual round in August, and wider reach to schools including government, government-aided and private schools, will pave the way towards higher overall coverage. Evidence Action will work in close collaboration with government stakeholders to strengthen the deworming program in line with the above recommendations and align with preparations for the biannual round in August 2016.

ANNEXURE 1

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

Indicators	School		Anganwadi	
	%	N	N	%
Type of School				
Govt./Govt. Aided schools	95.5	252	NA	NA
Private Schools	4.6	12	NA	NA
Respondent of the section				
Headmaster/Principal	77.7	205	NA	NA
Vice principal	8.7	23	NA	NA
Nodal Teacher	8.3	22	NA	NA
Any other teacher	5.3	14	NA	NA
Category of school				
Primary(1 to 5)	51.5	136	NA	NA
Primary with upper primary(1 to 8)	38.6	102	NA	NA
Primary with upper primary and secondary(1 to 10)	2.3	6	NA	NA
Primary with upper primary secondary and higher secondary(1 to 12)	0.8	2	NA	NA
Upper primary only(6 to 8)	1.1	3	NA	NA
Upper primary with secondary and higher secondary(6 to 12)	0.0	0	NA	NA
upper primary with secondary(6 to 10)	1.5	4	NA	NA
Secondary only (9 to 10)	2.3	6	NA	NA
Secondary with higher secondary(9 to 12)	1.1	3	NA	NA
Higher Secondary only or Jr. college(11 to 12)	0.8	2	NA	NA
Did teacher/ Anganwadi worker attended training in last 2 months	81.4	215	77.5	200
Did trained teacher provide training to other teachers				
Yes, trained all other teachers	77.2	166	NA	NA
Yes, trained some other teachers	12.6	27	NA	NA
No, did not train other teachers	7.9	17	NA	NA
Don't know /don't remember	2.3	5	NA	NA
Reason for not attending official training				
Location was too far away	4.1	2	9.8	5
Did not know the date/timings	49.0	24	60.8	31
Busy in other official work	4.1	2	0.0	0
Attended deworming training in the past	12.2	6	5.9	3
Not Necessary	8.2	4	7.8	4
Source of information about recent round of deworming program				
Departmental communication	62.1	164	47.3	122
Television	8.7	23	7.8	20
Radio	3.0	8	2.7	7
Newspaper	14.8	39	6.2	16
Banner	10.6	28	7.8	20

SMS	34.1	90	26.0	67
Training	38.3	101	32.9	85
Other school/teacher and Lady Supervisor	3.8	10	24.0	62
Awareness about the ways a child can get worm infection	84.1	222	NA	NA
Different ways that children can get worm infected				
Having foods without washing hands	89.2	198	79.8	206
Not washing hands after using toilets	77.5	172	68.6	177
Not using sanitary latrine	48.6	108	45.7	118
Moving in bare feet	62.6	139	51.6	133
Consume vegetables and fruits without washing	55.4	123	49.2	127
Having long and dirty nails	50.0	111	46.1	119
Receive SMS about the deworming program	64.4	170	55.8	144
Preference to receive the SMS				
Morning	28.4	75	28.7	74
Afternoon	12.9	34	8.1	21
Evening	10.2	27	10.1	26
Any time	45.8	121	45.7	118
Do not prefer the SMS	5.3	14	9.3	24
Having integrated distribution(Tables, Poster/Banner, handouts/reporting, adverse event reporting form) in training	37.2	98	39.1	101
Visibility over the Deworming Day Poster/Banner is posted			72.0	138
Clearly posted/visible to all	70.9	148		
Hidden in a room/partially visible.	11.3	19	10.0	20
Not posted/ not visible	17.7	36	18.0	35
Awareness about to whom to submit the completed School(CRC)/Anganwadi Reporting(ANM)	63.2	167	68.0	175
Retain a copy of the School/Anganwadi Reporting Form at the school after submitting one copy	15.1	40	79.0	203
Teachers/Anganwadi who think any adverse event can occur after taking the deworming tablets	34.8	92	25.0	64
Possible adverse events could be reported by children after taking the tablets				
Mild abdominal pain	60.9	56	71.9	46
Nausea	55.4	51	54.7	35
Vomiting	69.6	64	79.7	51
Diarrhea	17.4	16	10.9	7
Fatigue	17.4	16	12.5	8
Other, specify	12.0	11	4.7	3
Response in case a child complains of mild stomach ache, nausea, vomiting, and diarrhea after taking the tablets,				
Make the child lie down in open and shady place	79.9	211	80.2	207
Give ORS/ water	24.6	65	24.4	63
Observe the child at least for 2 hours in the school	36.4	96	34.9	90

Response in case the child continues to report symptoms of stomach ache, vomiting, diarrhea, etc. even after a few hours				
Call PHC or emergency number	69.7	184	63.6	164
Take the child to the hospital /call doctor to school	51.5	136	50.8	131
Don't know / don't remember	3.8	10	0.8	2
Other, specify	1.9	5	0.8	2
Deworming activity going in your school/Anganwadi today				
Yes, getting now	74.2	196	88.7	229
Yes, after few hours	12.5	33	0.0	0
No, will not administer today	13.3	35	11.3	29

Table: 2 Integrated Distribution of Drugs and IEC material

Items Received in training	Schools			Anganwadi		
	Received	Verified	Received in training	Received	Verified	Received in training
Tablets	91.3	79.3	60.2	92.2	76.9	62.6
Poster/Banner	76.9	73.4	60.1	74.8	72	62.7
Handouts/Reporting form	65.5	72.8	56.6	64.3	72.3	62.7

Note:-The sample size for items received in schools and *anganwadis* were 263 and 250 respectively

*The denominator for verified is the number of particular item received

Table3: Observation of deworming activity in the class/Anganwadi

Indicators	School (145)*		Anganwadi(171)*	
	%	N	%	N
Deworming activity is taking place in the class/Anganwadi	61.2	145	74.7	171
Teachers/Anganwadi worker giving any health education related to deworming				
Yes	84.1	122	79.5	136
Could not observe as I reached late	0.7	1	0.6	1
What are being included by the teacher/ Anganwadi worker as a part of health education to children				
Harmful effects of worms	58.2	71	54.4	74
How worms get transmitted	59.0	72	55.1	75
Benefits of deworming	55.7	68	54.4	74
Methods of worm infection prevention	38.5	47	44.1	60

Teacher/ Anganwadi worker were asking the children if they are sick/under medication before giving the tablet	89.7	130	83.6	143
What teacher/ Anganwadi worker did ,If there was any sick child in the class room				
Gave Albendazole tablet to the child	16.9	22	16.8	24
Did not give the Albendazole tablet to the child	83.1	108	83.2	119
Students/children are told to chew the tablet before swallowing it	93.8	136	93.0	159
Deworming tablets were distributed by				
Teacher/headmaster	93.8	136	0.0	0
Anganwadi worker	NA	NA	92.4	158
Asha/ANM	0.7	1	7.6	13
Students	4.1	6	0.0	0
Teacher/ Anganwadi worker asking students to take Albendazole tablets in the class/ Anganwadi only	99.3	144	94.7	162
Teachers/ Anganwadi worker following the protocol of putting single tick ✓ (deworming day) or double tick ✓✓ (mop-up day) on each child's name/roll no. in the attendance register after giving them the deworming tablet	75.9	110	77.8	133
Practice followed by teacher ,if the ticking/double ticking Protocol did not followed				
Prepare the separate list for dewormed child	17.1	6	39.5	15
Put different symbols	28.6	10	15.8	6
Nothing was done	51.4	18	42.1	16
Any child not given the prescribed dose of Albendazole tablet				
Yes, less than the prescribed doze	13.1	19	11.7	20
Yes ,more than the prescribed doze	2.8	4	6.4	11
No, the prescribed doze is being given	84.1	122	81.9	140
Any adverse event observed (nausea, vomiting, stomach-pain diarrhoea, etc.) after taking the tablet	11.0	16	8.2	14

*Deworming activity was observed by monitors in 145 schools and 171 *anganwadis*

Table: 4 Interview with school teacher

Indicators	%	N
Attended any official training for deworming program in the past 2 months	64.0	169
Received training for deworming		
At official level training	60.4	102
By Headmaster/ teacher	35.5	60
Others (specify)	4.1	7
Awareness about the ways a child can get worm infection	78.4	207

Different ways that children can get worm infected		
Having foods without washing hands	92.3	191
Not washing hands after using toilets	76.3	158
Not using sanitary latrine	51.2	106
Moving in bare feet	66.2	137
Consume vegetables and fruits without washing	51.2	106
Having long and dirty nails	45.9	95
Awareness about prescribed dose of albendazole		
One	95.5	252
More than one	3.0	8
Less than one	1.5	4
Teachers who think any adverse event can occur after taking the deworming tablets	36.0	95
Possible adverse events could be reported by children after taking the tablets		
Mild abdominal pain	81.1	77
Nausea	61.1	58
Vomiting	73.7	70
Diarrhea	16.8	16
Fatigue	21.1	20
In case a child complains of mild stomach ache ,nausea, vomiting, and diarrhea after taking the tablets, Your response should be		
Make the child lie down in open and shady place	81.4	215
Give ORS/ water	31.8	84
Observe the child at least for 2 hours in the school	33.3	88
If the child continues to report symptoms of stomach ache, vomiting, diarrhea, etc. even after a few hours, Your response should be		
Call PHC or emergency number	71.2	188
Take the child to the hospital /call doctor to school	47.3	125

Table: 5 Interview with school child

Indicators	%	N
Child got a white tablet in school today	95.2	218
Child was feeling sick before taking the tablet in the school today	8.3	18
Child got tablet by		
By Teacher / headmaster	96.8	211
By ASHA/ANM	0.5	1
By Other student	1.8	4
Other	0.5	1
Child consume tablet	98.6	215
Reason to not consume tablet		
Was feeling sick	33.3	1

I'm afraid of taking the tablet	0.0	0
Parents told me not to have it	66.7	2
Don't have worms so don't need it	0.0	0
Did not like the taste	0.0	0
Had difficulty swallowing	0.0	0
Taking home	0.0	0
Other, specify	0.0	0
Awareness of child that, how to consume the tablet		
Chewed tablet before swallowing	89.0	193
Swallowed tablet directly	11.0	25
Other, specify	0.0	0
Awareness of child that, why tablet is provided		
Deworming	79.4	173
Any other answer(unrelated to deworming)	4.1	9
Don't know /don't remember	16.5	36
Source of information about deworming activity		
Teacher / school	93.9	170
Television	5.0	9
Radio	1.7	3
Newspaper	5.5	10
Poster/Banner	22.7	41
Parents/siblings	7.7	14

ANNEXURE 2

Table 1: Findings from School/Anganwadi Coverage Validation data

Table:1 Coverage Validation Indicators	School		Anganwadi	
	%	N	%	N
Responses from the headmasters/principals/Anganwadi interviewed				
Attended training for deworming program	85.7	347	81.9	307
For schools/Anganwadi that didn't attend training, reasons were:				
Location of training was far away	11.1	6	19	12
Was not aware of the date/ timing of training	61.1	33	54	34
Busy in other official work	1.9	1	6.3	4
Attended deworming training in the past	9.3	5	1.6	1

Not necessary	13	7	7.9	5
Other reasons	24.1	13	17.5	11
Schools/Anganwadis observed deworming	93.1	377	95.7	359
Schools/Anganwadis received the followings				
Tablets	96.3	390	98.1	368
Poster	75.8	307	81.6	306
Handouts/Reporting form	73.3	297	74.4	279
Others	5.9	24	7.7	29
Received SMS about deworming program	62.7	254	56.3	211
Schools/Anganwadis had the sufficient drugs for deworming	85.7	323	90.7	323
Schools/Anganwadis where copy of school reporting form was available	61.2	231	55.1	200
For schools/Anganwadis that didn't have copy of school reporting form, reasons were:				
Did not received	23.29	34	18.87	30
Submitted to ANM	30.14	44	61.64	98
Unable to locate	15.07	22	7.55	12
Others*	31.51	46	11.95	19
Anganwadis having list of out of school(6-19) children	NA	NA	42.6	153
Anganwadis having list of non-registered(1-5) children	NA	NA	45.7	164

Table: 2 School Coverage Validation Indicators

Indicators	%
Schools where all the classes followed the correct recording protocol	62.1
Schools where one or more of the classes followed the correct recording protocol	66.6
Schools where none of the classes followed the correct reporting protocol	33.4
Schools where one or more of the classes followed other recording protocol	16.2
Schools where no reporting protocol was followed	17.5
State level verification factor	0.763
State inflation rate (which measures the extent to which the recording in school reporting forms exceeds records at schools)	30.92
Attendance on Deworming Day	69.7

Attendance on mop-up day	58.4
Children who attended on both Deworming Day and mop-up day	54.5
Maximum attendance of children on Deworming Day and mop-Up Day according to the CV data	73.6
Schools had surplus storage of drugs after deworming	43.2
Schools had complete school reporting form	97.5
Schools reported serious adverse event after taking the medicine	3.4
Average number of adverse events reported per school	0.1
State level inflation rate among trained schools (which measures how much the coverage reported in reporting forms exceeded school records in registers for schools that received training)	29.8
State level inflation rate among untrained schools (which measures how much coverage reported in reporting forms exceeded school records in registers for schools that were not trained)	69.8
School level inflation rate for schools that followed the correct recording protocol (measures how much coverage reported in reporting forms exceeded school records in registers, for schools that were following recording protocols, i.e., ticking).	25.3

Table: 3 Interview of children during Coverage validation

Indicators	%
Children received Deworming tablets	95.9
Supervised Administration of tablets	91.3
Children consumed tablet	94.6
Way child consumed the tablet	
Chewed tablet before swallowing	90.7
Swallowed tablet directly	9.3

Table: 4 Anganwadi Coverage Validation Indicators

Indicators	%
<i>Anganwadi</i> that followed recording protocol	90.5
State level verification factor for Registered children(1-5 years)	0.74
State level verification factor for non- registered children(1-5 years)	0.77

State level verification factor for out of school children(6-19 years)	0.69
State inflation rate (1-5 years)	34.6
State inflation rate for non- registered children (1-5 years)	28.9
State inflation rate for out of school children(6-19 years)	43.9

ANNEXURE 3

Authorization letter from the Government

राज्य स्वास्थ्य समिति, बिहार
An ISO 9001:2008 Certified Agency

Prabhakar Jha,
Joint Secretary, Health- cum- Incharge
Executive Director
Letter No. SHSB/GA/1523/2015/...612...

To,
State Project Director, Bihar Education Project Council,
Director, Integrated Child Development Services, Bihar
Patna, Dated: 27/01/2016

Sub: Letter of authorization for independent monitoring of National Deworming Day (NDD) 2016 in schools/anganwadis in Bihar.
Ref: F. DWI/BIHAR/2015-16/30, Date:18/01/2016.


Dear Madam/Sir,

In reference to the letter no F. DWI/BIHAR/2015-16/30, Date:18/01/2016, this is to inform you that Evidence Action as the technical assistance partner to the Government of Bihar is hiring the service of an experienced survey agency to conduct the independent monitoring of NDD, 2016. There will be around 125 monitors, each of them will visit one randomly selected school and nearby *anganwadi* on **February 10, 2016 (National Deworming Day)** and **February 15, 2016 (mop-up day)** and three randomly selected schools and three *anganwadis* for coverage validation during February 20-29, 2016 in 125 sampled blocks across the state. These monitors will observe the entire process of deworming in the school and *anganwadi*, go through the attendance register, school/*anganwadi* reporting forms, and physically validate the availability of drugs, IEC materials, interview *anganwadi* workers and interview headmaster; randomly selected teachers and children in the school. Please note that the independent monitoring is being resourced by Evidence Action and there will no monetary exchange with the department of Education/ICDS- Bihar and the schools being visited for this activity.

To facilitate access to the schools/*anganwadis* and smooth monitoring process, these independent monitors will need a letter of authorization from your kind self to carry the above mentioned activities in randomly selected schools/*anganwadis* during above mentioned dates in Bihar. You may also like to inform all the district and block level education/ICDS officials about the monitoring of the program by some independent monitors and desired cooperation from schools/*anganwadis* representatives.

Request you to please issue letters granting their access.

Thanking you,


Yours Sincerely,

(Prabhakar Jha)
Joint Secretary, Health
- cum- Incharge
Executive Director


राज्य स्वास्थ्य समिति, बिहार
An ISO 9001:2008 Certified Agency

Memo No. 612- Patna, Dated: 27/01/2016


Copy to:

1. Executive Director, Cell, State Health Society, Bihar for information.
2. State Programme Officer, (EFE), Bihar Education Project Council, for information and necessary action.
3. Assistant Director, Integrated Child Development Services, Bihar for information and necessary action.
4. State Programme Manager, Evidence Action Deworm the world Initiative, Bihar for information and necessary action.


Joint Secretary, Health
- cum- Incharge
Executive Director



परिसर कल्याण भवन, रोहतास, सहाय विभाग, समुद्र बिहार
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