

ANNEXURE 1: INDEPENDENT MONITORING DATA ANALYSIS

2.1 Process Monitoring Analysis (Deworming and Mop Up Day Monitoring)

The analysis is based on monitoring of the deworming process in a sub-sample of schools on deworming day, mop-up day. As mentioned before, the broad areas being monitored on Deworming day and Mop-up day are:-

- Training and Training Cascade
- Operations/ Monitoring Tools
- Verification of Deworming
- Adverse Effect
- Effectiveness of Public Awareness Campaigns
- Recording Protocol
- Drug Availability and Storage

Training and Training Cascade

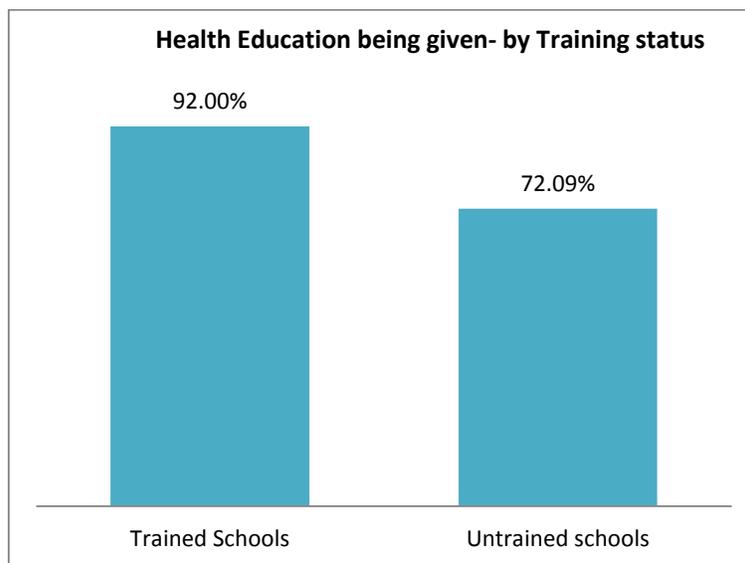
Training about deworming is an integral part of the Bihar deworming program. The trainings aim to equip the participants of the program with the correct procedure of conducting deworming, such as the right dose of deworming tablet, when to give the tablet, exclusion of sick children from deworming, possible adverse events that can occur etc. In addition, the trainings are an avenue for the participating schools to gather information about the deworming program, like health information about deworming, date of deworming and mop-up day, the specialized recording protocol and the date of submission of S forms. Thus, it is pertinent for the success of the program that maximum number of schools have access to this information. Moreover, the flow of information should reach every teacher who is conducting the deworming program. This is done with the help of a training cascade system which ends with a block-level training. The headmaster of every school is instructed to attend the block-level training and they are then expected to diffuse this knowledge to all other teachers who will conduct deworming in the school. The highlights of training and training cascade monitoring is as follows

- Independent process monitoring revealed that out of all the schools visited on the two process monitoring days (deworming day and mop-up day), only 77% schools had attended the official training. In 7 blocks, none of the schools visited by monitors had attended the official training. The detailed list of these blocks is given below .
- The main reason for this failure to attend the block-level training was the absence of information to schools about the date of training. This can be concluded from the headmaster interview, wherein 67% of the headmasters attributed the reason for non-attendance to the fact that they weren't aware of the date of the block-level training.
- Another important finding regarding the dispersal of training was the non-compliance of the instruction to train all other teachers who were conducting deworming. This was established during teacher interviews wherein 19% of the teachers admitted to not being trained, neither in the block training nor by other teachers.
- The physical evaluation by the monitors of the ongoing deworming program revealed that most parameters pertaining to the deworming process were being followed by the teachers. As mentioned before, these results were established by the monitors after

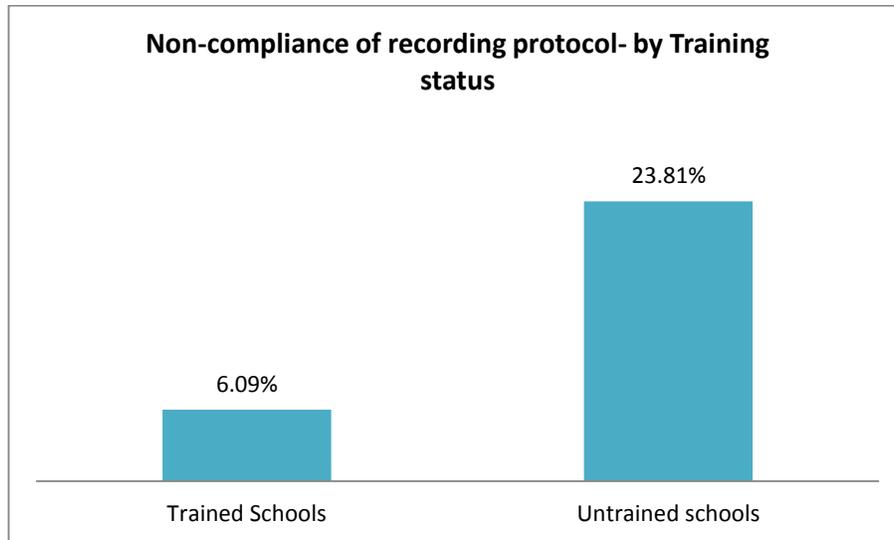
observing the way in which the teachers were conducting deworming in their classroom. 98% of the teachers administered the tablet after the children had finished their meal and 95% of them were instructing the children to chew the tablet before swallowing it.

- It was observed, however, that the children were given less than one tablet in 8% of the schools that were visited by the monitors. This indicated a lack of understanding of the correct dose of Albendazole.

A critical inference that can be made from these results is the importance of training in ensuring proper adherence to deworming protocols. The percentage of teachers in trained schools who gave health awareness before administering the tablet, stood at 92%, whereas in the untrained schools this was only followed in 72% of the cases. The following chart depicts the comparison of this indicator between schools that had attended the official training and those which hadn't.



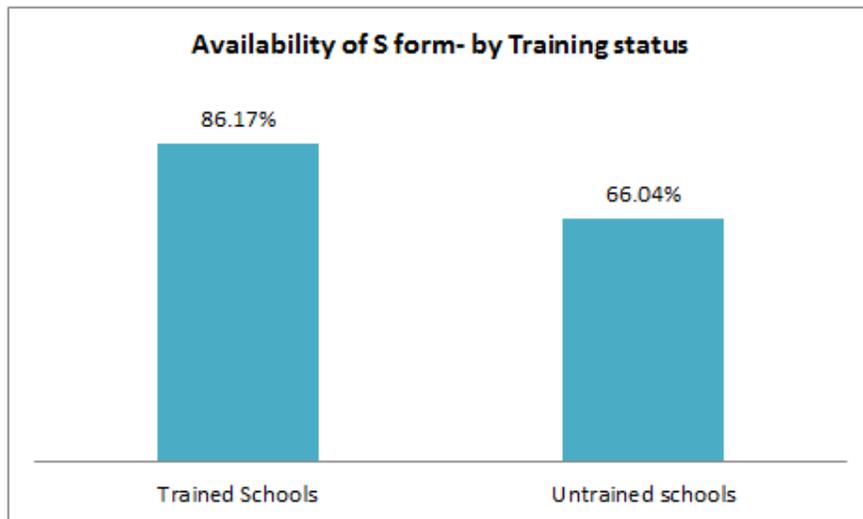
Another important implication of the official training was in the issue of compliance of recording protocol. The block-level trainings impart the information of correct recording protocol to be followed. It was noticed that in schools which had not attended the official training, the percentage of teachers not following the recording protocol (not ticking) was substantially higher as compared to schools which had attended the block-level training. 23.8% percentage of the untrained schools visited by the monitors were observed not following the recording protocol, whereas the corresponding number for trained schools stood at only 6%.



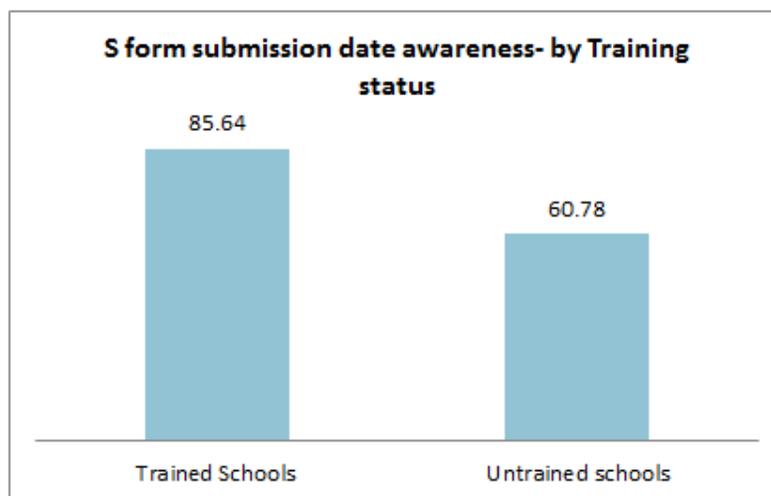
Operations/Monitoring Tools

The deworming program utilizes several tools for its smooth functioning. Some of these tools, such as S forms help in the process of program coverage. Others, like instruction sheet for teachers, are a vital tool in ensuring the critical elements of deworming are retained by the teachers even after the training has occurred. Independent process monitoring aims to check whether all these tools are ultimately available with the schools. The findings in this area are as follows:

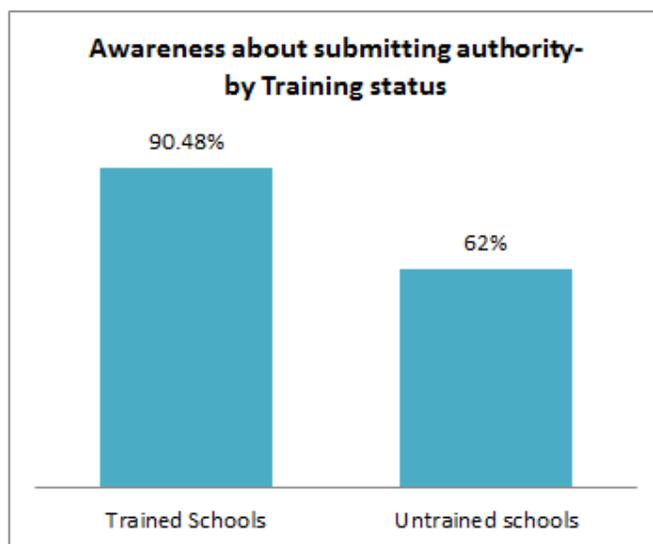
- The school reporting forms, S forms, were only available in 80% of the schools visited by the monitors across deworming day and mop-up day. Since S form enables schools to report their coverage, the lack of it may result in a distortion of program coverage numbers.
- An interesting observation was the significantly higher number of untrained schools which did not have the S form. Amongst the schools that were trained, 86.1% of them had the S form, whereas only 66% of the untrained schools had it.



- The instruction sheet which contains a summary of all deworming procedures and adverse event protocols is a handy instrument in ensuring these critical program details are retained by the teachers. Independent monitoring revealed that only 71.6% of the schools had the instruction sheet. This number stood at 75.5% for trained schools whereas it was 61.5% for untrained schools.
- The awareness about the submission date of S forms and who to submit it to is another important step in maintaining the accuracy of program coverage. Predictably, the training status of a school is an integral factor in determining whether the headmaster of the school is aware of this information. The consecutive charts depict this difference between the level of awareness about S form submission date and the submission authority, based on the training status of schools. 60.7% of the headmasters of untrained schools were aware of the date of submission of S form while the corresponding figure for trained schools is 85.6%.



- The chart below is a pictorial depiction of the observation that the headmasters in 62% of the untrained schools were aware of whom to submit the S form to, whereas 90% of the headmasters in the trained schools correctly knew of this information.



Verification of Deworming

The goal of this monitoring this area is to investigate the status of deworming at the ground level. Though the program is supposed to take place in all government schools, it is important to verify whether that is actually the case.

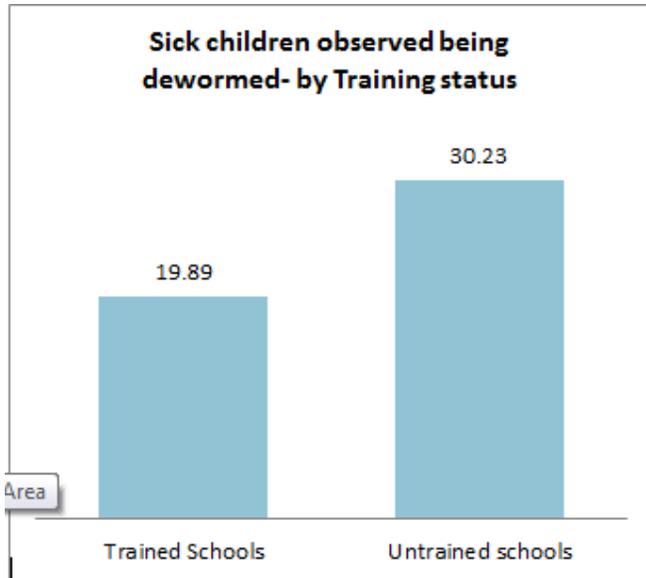
- Principals in 93% of the schools visited as a part of deworming day monitoring, mop-up day monitoring and coverage validation said that their school was conducting deworming. In 90% of the schools visited on deworming day and mop-up day, monitors physically confirmed the headmaster's claim that deworming program was conducted in the schools.
- The child interview, where children are asked about whether they received a white tablet on the day is an important source of verification of whether deworming actually took place across a given school, or not. 94% of the children interviewed in trained schools confirmed that they had received a deworming tablet, but only 77% of the children from untrained schools confirmed the same. This is a peculiar finding and it appears that there is a relationship between the training status of a school and the likelihood of it conducting deworming. The exact cause of such a relationship needs to be investigated in greater detail so it can guide the policies in the future.

Adverse Events

The administration of deworming medicine, Albendazole may cause adverse events like mild stomach ache, nausea and in rare cases, diarrhea. These events are mostly caused in children who suffer from a high intensity of worm infection. Although these events are fleeting, it is still important for the teachers to know about them to facilitate better management of children who may suffer from it. Monitors engaged in physical observations of deworming, as well as, one-on-one interviews with the class teacher to assess the level of preparedness of teachers in the area of adverse events. The following were observed:-

- An important finding was the schools where monitors observed sick children being dewormed. This number was 22.67% in this round of Bihar program, which is a cause

for concern. Monitors observed sick children being dewormed in 30.2% of the untrained schools and 20% of the trained schools. The monitors were instructed to intervene in such cases and ensure no sick child is dewormed. The graph below depicts this result.



- Another important finding was the large percentage of teachers who were unaware of the possibility of side-effects due to Albendazole. 44.5% of the teachers interviewed did not know about it. This is an area that needs to be emphasized since the effective management of adverse events entails full knowledge on the part of the concerned group.
- Monitors observing marginally higher cases of adverse events in untrained schools as compared to trained schools. Monitors observed cases of adverse events on 9.3% of the untrained schools. They observed these cases in only 5.2% of the trained schools.

Effectiveness of Public Awareness Campaigns

Community awareness or program awareness amongst children and community members is a valuable step in limiting the spread and intensity of STH worms. Additionally, the awareness drives are aimed at restricting any negative perceptions about the deworming program, and promoting practices that will lead to prevention of a reinfection.

- 89.7% of the children who were interviewed by the monitors knew what the deworming tablets were for. This is an encouraging finding as the awareness of worms, or how they are transmitted may lead to precautionary actions from the children.
- Majority of the children who knew about deworming first gained awareness about it either before deworming day, or on deworming day. This was true for 91.3% of the children who responded.
- The schools were provided with deworming posters in order to impart knowledge about the program amongst all visitors to the schools, including students, parents, community

members etc. It was found that the posters were clearly visible only in 57.2% of the cases and 23% of the schools didn't receive the poster.

- Most of the children (89.4% of the total interviewed) found out about deworming through their teachers/ in the school. The contribution of other community awareness programs such as radio announcements, television campaigns, posters, street theater etc. was limited in this case.

Drug Delivery and Storage

The success of the program is deeply affected by efficient allocation of drugs and its availability in every school. Thus, the last area of investigation under process monitoring is the status of drug availability as well as the quality of drug storage in the schools.

- The status of drug availability was adequate in this program. 96% of the schools reported that they had received the drugs for deworming, though there was a some disparity between trained schools and untrained schools. 97.8% of trained schools had received drugs while 88.4% of untrained schools had received the deworming drugs.
- Majority of schools had received the drugs either before deworming day (84%) or on deworming day (14.2%).
- The quality of drug storage was satisfactory in most schools that were monitored. 98.7% of them stored the drugs in a clean location, 91.1% of them were stored away from direct sunlight and 97.4% of them were stored away from the direct reach of children.

2.2 Coverage Validation Data

Coverage validation is an ex-post check of accuracy of the reporting data. This activity provides us with a framework to calculate the level of inaccuracy in the reporting data. Several indicators of measuring inaccuracy were calculated to get a complete picture of reporting data inconsistencies. The following are the details and findings of all these indicators:-

Non- Adherence to Recording Protocol

This indicator was used to measure the degree of non-adherence in recording protocols amongst schools. Thus, 10.2% of the schools did not follow the ticking procedure explained during block-level training.

Inaccurate reporting

The next step in the process of coverage validation is to look for the degree of inaccuracy in the reporting data by checking for schools which had ticks in the registers, and had positive values filled in the S form, but the two values don't match with each other.

- In 21.6% of schools, the deworming single ticks in the register did not match with the S form deworming numbers.
- For mop-up day this inaccuracy was marginally lower at 16.9%. Thus, the number of double ticks did not match with the mop-up day number reported in the S form.

Verification Factor

Verification factor is an indicator which is often used to assess the reporting quality. It is also widely used in health programs for the same reason. Any value of this ratio between 0.85 to 1.2 is considered acceptable.

- **The State level verification factor** was calculated using the following formula

$$\text{State level verification factor} = \frac{\text{Number of ticks found in schools across the state}}{\text{Total reported number for those schools}}$$

Thus, in the 749 schools that coverage validation data was received from, we calculate the aggregated number of ticks for all these schools and divide the sum by the sum of deworming coverage reported in these schools. This exercise gave us a ratio of 0.9215 as the state level index.

- **Block- level verification factor** was calculated by modifying the aforementioned formula. The block-level distribution of this verification factor gave several interesting results. It was calculated for schools which either had positive ticks or had positive values in S form¹ using the formula

$$\text{Block Verification Factor} = \frac{\text{Number of ticks found in schools across the block}}{\text{Total reported number for those schools}}$$

The block level value ranged from 2.15 (indicating severe significant underreporting) to 0 (indication complete overreporting). Blocks Runni Saidpur and Kanti had a value of 0 in this indicator, suggesting that there were no ticks at all across all the schools visited by independent monitors in these blocks. This is a cause for concern and needs further assessment to ensure the parameter is improved. There were well-performing blocks where the monitors detected no inaccuracy in reporting at all. There were 23 blocks in which the block-level verification was 1, thus indicating complete accuracy of the reporting data. The complete list of blocks and their corresponding block-level factors are given in Annexure 2.

Inflation Rate

The degree of inflation/deflation in the reporting data has severe ramifications in affecting the program coverage numbers.

- The total inflation rate for Bihar was estimated to be 8.5% the data received from 749 schools. This number included a wide array of cases of inflation as well as deflation. The extreme cases of inflation included schools which had reported positive values in the S forms, without *any* corresponding ticks in the attendance registers. On the flip side, there were also a handful of cases where the monitors discovered tick marks in the

¹ This is done to exclude schools that did not do deworming, although even if they were added, it would not affect our calculation because the number of ticks and S form information is both 0 for these schools. So they wouldn't alter the numerator or denominator.

attendance, but the S forms contained zero in the deworming information column. In 21 schools, monitors found ticks but the S forms depicted no deworming. Thus, there were cases of severe over reporting as well as underreporting. The state inflation rate was calculated by comparing the cumulative numbers reported in the S form, with the total number of ticks actually present in the attendance registers of all schools combined. The value was calculated using the following formula

$$\text{State inflation rate} = \frac{(\text{Total no. reported in S forms} - \text{Total no. of ticks in attendance})}{\text{Actual number of ticks}}$$

- For the sub-set of schools that had ticks as well as positive S form numbers, the school level inflation rate was calculated. The data received from coverage validation showed that the mean level of school inflation came was 0.96%. This school inflation rate was calculated using the formula

$$\text{Inflation rate for every school} = \frac{(\text{S form reported number} - \text{Actual number of ticks})}{\text{Actual number of ticks}}$$

While the state level inflation rate was 8.5%, the school level inflation rate varied in the extreme range of from -85.1% (indicating a severe underreporting) to +146.5% (indicating severe over-reporting). Although the school inflation rate has a large variance, the extreme positive and negative values cancel each other out when they are averaged. For this reason, the average school inflation rate comes out to 0.96%.