



Evaluation

Program Design

Research

Capacity Building

Final Report

Effect of Improved WinS
on Girls' Educational Outcomes

Submitted to
UNICEF
73 Lodi Estate
New Delhi

Impact Evaluation
Monitoring & Evaluation Systems
Socio-Market, Economics and Policy Research
Evaluation Training and Capacity Building

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ABBREVIATIONS AND ACRONYMS

AP	:	Andhra Pradesh
ASER	:	Annual Survey of Education Report
CAPI	:	Computer Assisted Personal Interviews
CFSS	:	Child Friendly School System
cRCT	:	cluster Randomized Controlled Trial (cRCT)
Govt	:	Government
IDI	:	In-Depth Interview
IHHL	:	Individual Household Latrine
KII	:	Key-Informant Interview
LPG	:	Liquid Petroleum Gas
MDM	:	Mid-day meals
MHM	:	Menstrual Hygiene Management
MHRD	:	Ministry of Human Resource Development
MP	:	Madhya Pradesh
NAS	:	National Achievement Survey
NEERMAN	:	Network for Engineering Economics Research and Management
RTE	:	Right to Education (Act)
RFP	:	Request for Proposal
SBM	:	Swachh Bharat Mission
SBSV	:	Swachh Bharat Swachh Vidyalaya
SSA	:	Sarva Shiksha Abhiyan
SVP	:	Swachh Vidyalaya Puraskar
TOT	:	Training of Trainers
U-DISE	:	Unified District Information System for Education
UNICEF	:	United National Children Fund
WASH	:	Water Sanitation Hygiene
WinS	:	WASH in School

EXECUTIVE SUMMARY

Water-sanitation-hygiene (WASH) facilities and services in schools (WinS) are believed to play an important role in increasing enrolment, ensuring regular attendance, and eventually better learning. Importance of WinS for education has always been acknowledged; even the Right to Education Act mandated basic WASH facilities in schools. Successive governments have invested in WinS through various programmes since early 1990s and development organizations such as UNICEF have been supporting such government efforts for decades.

Since 2014, Swachh Bharat Mission (SBM) has instilled a greater sense of urgency for sanitation and cleanliness in households, communities and institutions including schools and today promoted as the biggest behaviour change programme in the World. Under the larger context of SBM, Ministry of Human Resource Development (MHRD) launched Swachh Bharat Swachh Vidyalaya (SBSV) initiative to improve access to WASH facilities, promote their use and maintenance, and make WASH a movement in the schools. The MHRD constituted Swachh Vidyalaya Puraskar (SVP) in 2016 to motivate schools to excel in WinS through the spirit of competition among schools. Under SVP, schools are required to improve upon and are assessed for multiple WASH components such as adequate number of gender segregated toilets with privacy and comfort, adequate water supply for sanitation purposes, availability and safety of drinking water, provision of adequate handwashing stations with soap and water and behaviour change activities, hygiene education and operations and maintenance of WASH facilities.

However, it there is no evidence whether improvement in WinS facilities, services and practices after the launch of SBSV and SVP led to measurable improvements in students' enrolment, attendance or learning outcomes. This study was commissioned by UNICEF to address these questions with a cross sectional mixed methods research design which can be commissioned and completed within a 3 months period.

The primary research question for the study is “Does improvement in water, sanitation and handwashing facilities and practices achieved under the context of SBSV reduce school absenteeism of girl students?” The self-assessment ratings of school under SVP 2017-18 was required to be used as the proxy indicator for WinS levels. The study was designed to find associations between high SVP ratings and absenteeism as well as other secondary outcomes of interest – enrolment and learning outcomes. UNICEF also required a qualitative research component to provide additional nuances to the quantitative research findings and identify enablers and barriers to regular attendance.

The study combined statistical causal-inference analysis with qualitative research methods of In-Depth Interviews (IDIs) and key-informant interviews (KIIs) to answer above questions. The causal pathway framework of how improved WinS can improve educational outcomes identified several confounders at individual, family, school and community levels which can result in spurious association between WinS and educational outcomes or can mask true impacts of WinS. A simplistic cross-sectional analysis would not be able to control for such confounders. Therefore, the analysis strategy is to compare the educational outcomes in high- versus low-rated SVP schools while

controlling for observed and unobserved confounders to the extent possible subject to practical limitations the study faces.

We compared ~500 schools which had high (4 and 5 star) SVP ratings with ~500 schools which had low (1 and 2 star) SVP ratings within the *same* district to control for district level confounders. We further controlled for school and girls level characteristics which could have confounded the results in a regression analysis. The sample was restricted to only government and government aided elementary and secondary schools in rural areas. The data for this study was collected from 11000+ girl students in upper primary and secondary from ~1000 schools in 44 districts across eight states between 23 January and 18 February 2019 by a team of trained professional enumerators.

Additionally, secondary district-level data from U-DISE and National Achievement Survey (NAS) was analysed to assess if high coverage of drinking water and girls only toilets in a district is associated with better learning levels in the district. Finally, qualitative IDIs with girl students and KIIs with teachers were conducted by researchers in a subset of purposively selected schools with high and low SVP rating. KIIs were also conducted with cluster-block-district levels officers as needed.

The main findings from this study are as follows.

SVP is indeed a good proxy for WinS levels, but SVP rating process can be further strengthened to reward exemplary WinS performance. The study first validated the assumption that SVP rating is indeed a good proxy for the overall WinS level. We find statistically significant and consistent results that high-SVP rating is associated with independently assessed and verified overall WinS status by our survey team. While the SVP rating was indeed a valid proxy for better WinS level, a large proportion of high-SVP rated schools failed to reach the expected level of quality and functionality of WinS facilities under the SVP. This gap between the SVP score and objective verification by our enumerators suggests that there is a need to improve SVP rating process to find and reward truly exemplary performers.

Better WinS levels or high SVP rating is not associated with reduced absenteeism, increased enrolment or better learning levels. We find no clear evidence that better WinS or higher AVP rating is associated with reduced absenteeism once the confounders were controlled for. We also did not find statistical evidence of effect on reduced dropout and retention, increased enrolment or transition to the next grade or higher learning outcomes. The overall implication of the findings is that WASH is not as strong a driver of educational outcomes as some of the other non-WASH drivers measured (and controlled for in the analysis) or unmeasured (and not controlled for in the analysis). The qualitative research also could not find consistent evidence that WASH can reduce absenteeism or school dropout or improve learning outcomes.

One main reason for not finding any effect of WinS on educational outcomes is that even the low rated SVP schools perhaps had basic levels of WinS which were enough to address any barriers to education due to poor WASH that might have existed in past years. Therefore, the findings don't suggest that poor WASH is not a barrier to achieving educational outcomes but that the schools which participate in SVP are perhaps not the ones where this problem is pervasive. Another limitation of the study design is that the sample was school based and not the general population based so that the sample may have excluded girls who have dropped out during the academic year

or who are regularly absent from the school. If true, then the study may have underestimated the true effects of WinS on absenteeism.

On the other hand, the study also found that WinS levels may be at a level which do not impede attendance due to efforts under previous WinS programmes, especially those since the Right to Education Act under the Sarva Shiksha Abhiyan. The qualitative research also found that the major contribution of SBSV or SVP is to improve “quality” of WinS in terms of convenience, cleanliness and maintenance aspects and to change behaviours and practices of students. Therefore, it is also possible that addressing the issue of access to basic WASH facilities and services is more important to reduce absenteeism whereas additional improvements in terms of “quality” of such facilities and their better utilization by students are not necessary to address basic decisions such as whether to attend the school or not.

Several non-WASH factors play an important role in enrolment, absenteeism, and by extension, learning outcomes of the students. Qualitative research identified three important factors that drive (or impede) girls’ attendance: (1) availability of female teachers; (2) harassment and eve teasing in schools and in commute to schools; and (3) community norms around attending school during menstruation and use of children for household chores and other economic activities. In addition to these, several other factors were identified as drivers or barriers to educational outcomes such as (a) material benefits of attending schools such as bicycles and free uniforms, (b) child marriages, (c) quality of teachers, and (d) access to school (distance and difficult commute).

1. INTRODUCTION

Water-sanitation-hygiene (WASH) facilities and services play an important role in improving health of children and enabling access to education. Not only can children miss school when sick with waterborne diseases, inadequate WASH facilities in school can be a barrier to enrolment, attendance and continuation of education. Poor attendance combined with indirect effect of diseases on cognitive abilities of the students can eventually affect their learning and performance in the school. Therefore, National, state and local governments have been investing to improve WASH in School (WinS) for decades.

The District Primary Education Programme initiated system-wide and large-scale improvements in WinS in 1994. School Sanitation and Hygiene Education component followed up from 1999 to 2012 under the Total Sanitation Campaign and continued under Nirmal Bharat Abhiyan until 2014. The Right to Education (RTE) Act (2009) also mandated access to basic WASH facilities in elementary schools.

Thereafter, activities under the Sarva Shiksha Abhiyan (SSA) also expanded the coverage of drinking water and toilets. Since 2014, Swachh Bharat Mission (SBM) has instilled a new sense of urgency for sanitation and cleanliness across India in households, communities and institutions including schools. Overall, the initial efforts resulted in near universal availability of drinking water whereas the efforts in the past decade rapidly increased the coverage of toilets. For example, Unified District Information System for Education (U-DISE) reported that 92 percent schools had drinking water and 58.82 percent schools had separate toilets for girls in 2009-10 whereas in Year 2016-17, 97.1 percent schools had drinking water and 96.5 percent schools had separate toilets for girls.

Under the larger context of SBM, Ministry of Human Resource Development (MHRD) launched Swachh Bharat Swachh Vidyalaya (SBSV) initiative to not only improve access to WASH facilities in schools but to go beyond infrastructure towards promoting their use, ensure maintenance and make WASH a movement in the schools. The MHRD constituted Swachh Vidyalaya Puraskar (SVP) in 2016 to motivate schools to excel in provision of WASH facilities and services to students through the spirit of competition among schools. The SVP became a quick success story in the terms of voluntary participation of school the competition – almost a third of the schools in India competed for the SVP awards at district, state and national levels in 2018. Under SVP, schools are required to improve upon and are assessed for multiple WASH components such as adequate number of gender segregated toilets with privacy and comfort, adequate water supply for sanitation purposes, availability and safety of drinking water, provision of adequate handwashing stations with soap and water and behaviour change activities, hygiene education and operations and maintenance of WASH facilities.

However, it remains unclear whether improvement in WinS facilities, services and practices after the launch of SBSV and SVP led to measurable improvements in students' enrolment, attendance or learning outcomes. This study seeks to find if credible association exists between high level of WinS proxied by high rating in SVP competition and the educational outcomes.

1.1 Literature Review

The existing evidence on impacts of WinS on educational outcome is usually from qualitative research. For example, a qualitative research in Bolivia found that young girls felt a sense of shame and fear

associated with Menstrual Hygiene Management (MHM) in schools which led girls to dropping out of school.[1] Similarly, girls were not allowed to attend schools during their periods due to cultural and religious practices in Nepal.[2] Without proper sanitation facilities in schools, these girls preferred to drop out. Even in India, lack of MHM facilities and proper sanitation were major reasons for dropping out of school.[3]

Few quantitative research studies have explored the effect of WASH on educational outcomes as well. A cluster randomized controlled trial (cRCT) in Kenya found that water supply, hygiene promotion, water treatment and sanitation improvements increased enrolment but only among schools with poor water access during dry season.[4] Other publications using the same cRCT data also found reductions in diarrhoea and absenteeism under certain conditions.[5,6] Another cRCT in Kenya didn't find any effect of a WinS intervention on *Escherichia coli* contamination on students' hands and provision of toilets may actually have increased the contamination on their hands in absence of proper handwashing.[7] A systematic review failed to find studies with adequately detailed data and results to assess the effect of gender separated toilets on educational outcomes.[8] This review found lack of credible evidence of impact of even overall WinS on educational outcomes and recommending this as a priority research gap to fill. In India, we found only one published econometric analysis using U-DISE and Annual Status of Education Report (ASER) data.[9] This study found that gender separated toilets increased enrolment of pubescent girls in schools while a unisex toilet did not have any impact on their enrolment and neither was associated with better learning levels. However, the results were confounded because the schools with gender separated toilets tended to also have more female teachers.

Lack of rigorous evidence on importance of WinS for educational outcomes does not undermine the overall importance or need for WinS which is now well established through rights based framework as well as logic based framework. Instead, these mixed results highlight how difficult it is to attribute improved outcomes to a specific WASH intervention. The study context, baseline levels of WASH, duration of exposure to any WASH intervention, intervention fidelity, biases in measuring outcomes all play a major role. Also, only WinS improvements may not be enough to improve educational outcomes and other social or infrastructural factors may be more dominant drivers of educational outcomes .

1.2 Research Objectives

The primary research question for the study is “Does improvement in water, sanitation and handwashing facilities and practices achieved under the context of SBSV reduce school absenteeism of girl students?” The self-assessment ratings of school under SVP 2017-18 is the indicator for WinS level as per the Request for Proposal (RFP) by UNICEF. The secondary research questions are as follows:

- If and how improved WinS under SVP impacted retention (enrolment, continuation, etc.) and overall learning outcomes of girl students
- Explore other enablers and barriers to educational outcomes.

1.3 Summary of Study Methods

We answer the research questions using mixed methods which combine statistical causal-inference analysis with qualitative research methods of In-Depth Interviews (IDIs) and key-informant interviews (KIIs).

The causal inference strategy is to match and compare ~500 schools which have high (4 and 5 star) SVP ratings with ~500 schools which have low (1 and 2 star) SVP ratings within the *same* district to control for district level confounders. The sample is restricted to only government and government aided elementary and secondary schools in rural areas. The data for this study was collected from 11000+ girl students in upper primary and secondary from ~1000 schools in 44 districts across eight states between January and February 2019. Structured interviews of girl students collected data on absenteeism, its reasons, utilization of WASH facilities, and basic socio-economic-demographics. Teacher interviews and school surveys verified WASH facilities in the school and collected data on WASH practices, operations and maintenance, WASH promotion, and secondary school records data on absenteeism, enrolment and examination results (to the extent available). Additionally, secondary district-level data from U-DISE and National Achievement Survey (NAS) is analysed to assess if high coverage of drinking water and girls only toilets in a district is associated with better learning levels in the district.

In a subset of purposively selected schools with high and low SVP rating, qualitative IDIs were conducted with girl students and KII with teaching staff. KIIs were also conducted with cluster-block-district levels officers as needed. The purpose of qualitative research was to explain the findings from quantitative analysis: how WinS – especially the improvements in recent years under the SBSV/SVP – can affect educational outcomes (enrolment, absenteeism, academic performance), and to understand other contexts, enablers and barriers to achieving better educational outcomes.

1.4 Organization of the report

Chapter 2 summarizes the quantitative and qualitative study design, introduces the tools used and the analysis. It also describes the field work procedures. Chapter 3 include results from quantitative and qualitative research. Quantitative data analysis and inference is the bedrock of this study whereas qualitative research findings provide important context and highlight agreements or contradictions with the quantitative research findings. In chapter 4, we summarize the insights from this study and describe key limitations which must be considered in interpreting the findings. Appendices to this report include a few qualitative case notes as well as detailed statistical results tables which are not included in the main report to keep it more reader friendly. Volume II of this report consists of the questionnaires used.

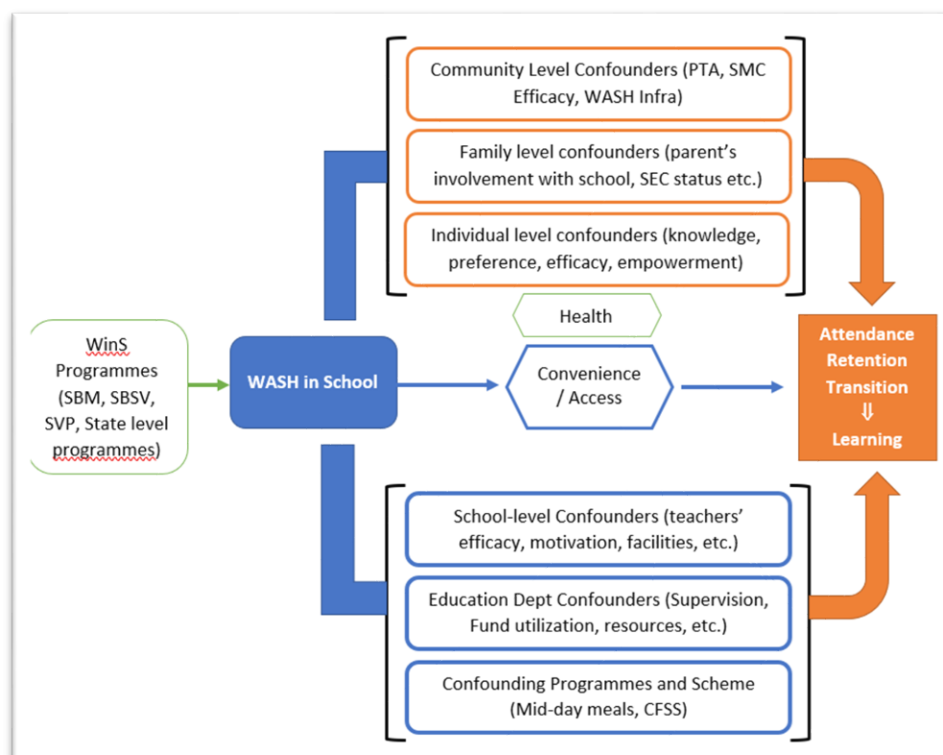
2. METHODS

2.1 Study Design

2.1.1 Analysis Framework

Figure 1 presents the framework of how improved WinS can improve educational outcomes in presence of confounders at individual, family, school and community levels. The framework assumes that WinS programmes such as SBSV can indeed improve WinS services to and WASH practices of the students. Improved WinS can then improve educational outcomes through two channels – reduced illnesses; and/or better access to or convenience of WASH facilities in school. However, multiple confounders can result in spurious association between WinS and educational outcomes or can mask true impacts of WinS. For example, parents, school management, government officers, communities or political leadership who prioritize education can invest in or cause authorities to improve WASH services to students. However, they can also invest in other non-WASH initiatives which can result in higher attendance and better learning outcomes such as better school infrastructure, child friendly pedagogy, or ensuring presence of female teachers. Therefore, at least a part of association between WinS and educational outcomes could be because of non-WASH factors.

Figure 1. Causal Pathway from Improved WASH to Better Educational Outcomes



A simplistic cross-sectional analysis which does not control for confounders can find spurious correlation between improved WinS and educational outcomes or even undermine or negate the true impacts of WinS. Therefore, we use a design rooted potential outcomes causal inference theory to evaluate effect of improved WinS [10,11]. According to this theory unbiased causal impacts can be estimated if the

intervention (high WinS level) and control (low WinS level) groups can be matched on all observed and unobserved confounders. That is, all confounders were similarly distributed between the two groups of school before the interventions to improve WinS begun.

Our analysis strategy is to compare the educational outcomes in the two groups of high versus low rated SVP schools where the confounder control is achieved through both sampling and statistical analysis. While controlling for *all* observed and unobserved observational confounders is impossible in a post-hoc and cross-sectional study such as ours¹, the study design attempts to minimize the confounding bias to the extent possible as follows.

First, we matched high and low SVP rated schools in the same district so that we can theoretically ensure that time invariant confounders at the district and higher levels are automatically controlled.

Second, to control for confounders at the levels below the district, we matched the two groups of school on basis of school characteristics. We used nearest neighbour propensity score matching (PSM) method to find matched groups of high and low SVP scoring schools within each district. The PSM algorithm used the following school characteristic data from SVP 2017-18 dataset: (a) category of school (primary + upper primary, secondary only, etc.); (b) only girls versus co-ed school; (c) number of girl students enrolled; (d) whether boys-to-girl ratio is 1.5 or higher; (e) whether female teachers are present in school; and (f) if school participated in SVP in 2016-17. We assume that if the two school groups within the same district are similar in terms of above characteristics, then perhaps they also have similar distribution of unmeasured or unobserved confounders at community, school and even household level. It is indeed a big assumption but one that can be partially tested in terms of primary survey data collected in this study.

Finally, the statistical tests to estimate associations accounted for any observed differences in school or student characteristics which differ between the two groups of school. We used regression models to compare educational outcomes between the matched groups of schools while controlling for all school, household and individual student level characteristics which were found to be different (imbalanced) between the two groups.

2.1.2 Sampling

Sample Frame: We started with a universe of 5,33,680 schools in the SVP 2017-18 database. The target population for this study is girl students in upper primary and secondary government and government-aided schools in rural areas. Therefore, we excluded only primary, only boys, private (unaided) schools, and schools where girls in puberty were likely not available as per the SVP data. From practicability perspective, we further excluded schools with <30 girls to have sufficient sample of girls to survey in each school and schools with >1000 girls to remove very large schools (and possibly outliers in the SVP dataset).

Our analysis strategy is to compare high versus low SVP rated schools so that we exclude schools which cannot be assigned to either of these two groups. We retained 5-star and 4-star rated school with good MHM facilities as high SVP rated schools and all 1-star and those 2-star with *not-good* MHM facilities as

¹The gold standard to prove causation is randomized controlled trials which are often not feasible in evaluating real life programmes and certainly not feasible in a *post hoc* evaluations such as ours. Rigorous non-experimental designs also exist but most require both a baseline survey as well as inclusion of a counterfactual/control group.

low SVP rated schools. We exclude schools which were rated average (3-star), 4-star rated schools which didn't have good MHM facilities or 2-star rated schools which had good MHM facilities.

Finally, to ensure that we find at least 10 matched pairs of high and low SVP rated schools within each district, we restricted the sample frame to districts with at least 15 high-SVP rated schools and 30 low-SVP rated school.² Only twelve states had at least one district where both groups of schools existed in sufficient numbers. Finally, to achieve the economies of scale given the timeline of and resources for the study, we decided to exclude 4 states where only 2 districts met the inclusion criteria. Thus, the final sample frame consisted of 20,812 schools from 78 districts in 8 states.

Sampling of Schools: On basis of nearest neighbour PSM algorithm, we were able to find 13 matched pairs of schools in each district on average (a total of 1168 schools; see **Table 1**). The list of variables from the SVP data used in PSM are listed in the previous section. We sampled up to six districts from each of the eight states (Maharashtra - five districts, Telangana - three districts) and on average 12 pairs of schools per district to meet the design sample size requirement of 1000 schools. The extra matched-pairs of schools if any were used as potential replacements in a district, if needed. The final target sample size (1018 schools) and the actually achieved sample size (1015 schools) is summarized in **Table 1**.

Sampling of Girl Students: In each school, enumerators randomly sampled up to 15 girl students from Grades 6 to 10 in two steps. First, one division for each Grade was sampled randomly in case multiple divisions were available for a given grade. Second, up to 4 girls were randomly sampled from each class using the attendance roster as the sample frame. We expected on average 10 girl students per schools or about 10,000 girl students total. We actually completed survey of 11,027 girls as summarized in **Table 1**. Appendix Table 1 is a district level summary of sample size.

Table 1. Sample Summary at State Level.

State	Number of districts after matching	Number of districts sampled	Number of matched schools	Target Sample Size	Achieved Sample Size
Andhra Pradesh	11	6	144	132	134
Telangana	3	3	82	72	71
Chhattisgarh	13	6	154	142	141
Madhya Pradesh	9	6	168	140	139
Rajasthan	15	6	160	140	138
Gujarat	11	6	156	132	133
Maharashtra	5	5	134	116	115
Odisha	11	6	170	144	144
TOTAL	84	44	1168	1018	1015

Sample for qualitative research: Qualitative research was meant to be free-flowing and unstructured unlike the quantitative causal inference analysis. The sampling for qualitative research was purposive. We had originally proposed 30+ IDIs with girls and 20+ KIIs with teachers and other staff from four states; one state from each zone – south, west, north and east. The sample size was considered adequate to

² The PSM algorithm required a higher number of low-level WinS schools to identify a matched pair with a sampled high-level WinS school because schools which are not on common propensity score support are dropped in PSM. After multiple trials PSM runs, we identified that at least 30 low-level WinS schools in each district would be required to find on average 12 matched pairs in each district.

obtain heterogeneity of responses, was similar to sample size in other qualitative research studies in WASH sector we reviewed and was practically manageable within the proposed timeline and budgeted resources. We implemented the qualitative research in two phases – along with the quantitative data collection and after the draft quantitative analysis was concluded.

Originally, we planned to cover only four states for qualitative research, but we felt a need for richer geographical spread in the sample because not enough differences or heterogeneity of information was forthcoming from respondents of the same state. Therefore, we conducted qualitative research in all eight states to the extent available manpower and budget allowed³; the qualitative research sample size is summarized in Table 2.

Table 2. Qualitative IDI and KII Sample

	In Depth Interviews		Key Informant Interviews	Total
	High SVP Rated school	Low SVP Rated school		
Planned	16	16	20	52
Achieved	13	21	19	53
States-wise distribution of IDIs and KIIs				
Rajasthan	3	3	4	10
Madhya Pradesh	0	5	3	8
Odisha	3	3	2	8
Telangana	3	5	0	8
Chhattisgarh	2	3	2	7
Maharashtra	2	2	2	6
Andhra Pradesh	0	0	3	3
Gujarat	0	0	3	3

For IDIs, we interviewed girls from separate classes so that we can observe difference in needs and use of WASH facilities by between younger and older girls. We also tried to obtain heterogeneity in the sample by selecting girls who regularly attended schools and those who didn't. The respondents for the IDIs were identified as per above criteria in discussion with the class teachers and fellow students using snowballing technique. Female interviewers conducted IDIs with girls in privacy but in 3 schools where girls were too shy, they were first interviewed informally in groups of 4-6 girls. For KII, we selected teachers of the schools sampled for IDIs with girls. Additionally, a few education officers and cluster resource persons were also interviewed to incorporate information from block or district perspectives.

2.1.3 Measurement Tools

The following tools were used for data and information capture. Except qualitative tools, all instruments were administered as Computer Assisted Personal Interviews (CAPI) on Survey CTO Platform using android tablets. Volume II of this report include all questionnaires.

³ We didn't conduct any IDIs in Andhra Pradesh because we had already covered Telangana which was a part of Andhra Pradesh. We didn't do any IDI in Gujarat because we didn't have a Gujarati speaking female researchers in staff or had budget to hire an external consultant, but the Gujarati speaking male researchers conducted KIIs. In MP, we conducted IDI in only low-SVP rated schools because adequate information from high-SVP rated schools was available from neighboring states and richer information was forthcoming from low SVP-rated school regarding drivers for not attending the school.

Girl student questionnaire: This questionnaire measured socio-economic and demographic characteristics of the student, her access to and use of WASH facilities in the school, her perception about enabling factors and barriers to attendance and education and recall of her absenteeism (days and reasons). The primary indicator of interest is absenteeism recall by the girl students because the official school attendance records were considered less reliable⁴. To aid girl students' recall we asked absenteeism over gradually increasing recall period from yesterday to last 7 days to last month and finally last 3 months. We also asked them to recall absenteeism by most recent events of sickness and menstruation. Finally, as a supporting indicator, for each sampled girl, we copied from the school records (if available) her attendance in the past academic year. For each sampled girl, we also copied from school records (if available) her annual examination marks in mathematics, science and main-language from the previous academic year as indicators of "learning outcomes" for that girl.

School Questionnaire: This tool collected information from teachers as well as through observations of school facilities by the enumerators. This tool collected detailed information WASH facilities and their level of functionality, WASH operations and maintenance, academic and sports facilities available in the school, typical reasons for absenteeism in the school, WASH education and promotion etc. Enumerators also copied from school records (if available) number of students enrolled in different grades, passed to the next grade in the last academic year, and for one division for each class or grade level, we also collected data on number of students, the total number of instructional days in the last calendar month, and days missed by the students in the last calendar month.

IDI and KII Guides: Three separate discussion guideline with open-ended questions were developed for (1) IDIs with girls, (2) KIIs with school teachers, and (3) KII with resource officials. The themes mainly captured whether and how WASH facilities in school are being used, if and how inadequacies in these can affect attendance-enrolment-dropout, what other factors influence attendance-enrolment-dropout and what factors influence learning outcomes. However, the researchers were not restricted to these exact set of questions and themes. Instead, interviews were guided towards capturing individual experiences and views of the respondents in the direction where relevant and rich information was forthcoming.

2.2 Field Procedures

2.2.1 Team Organization

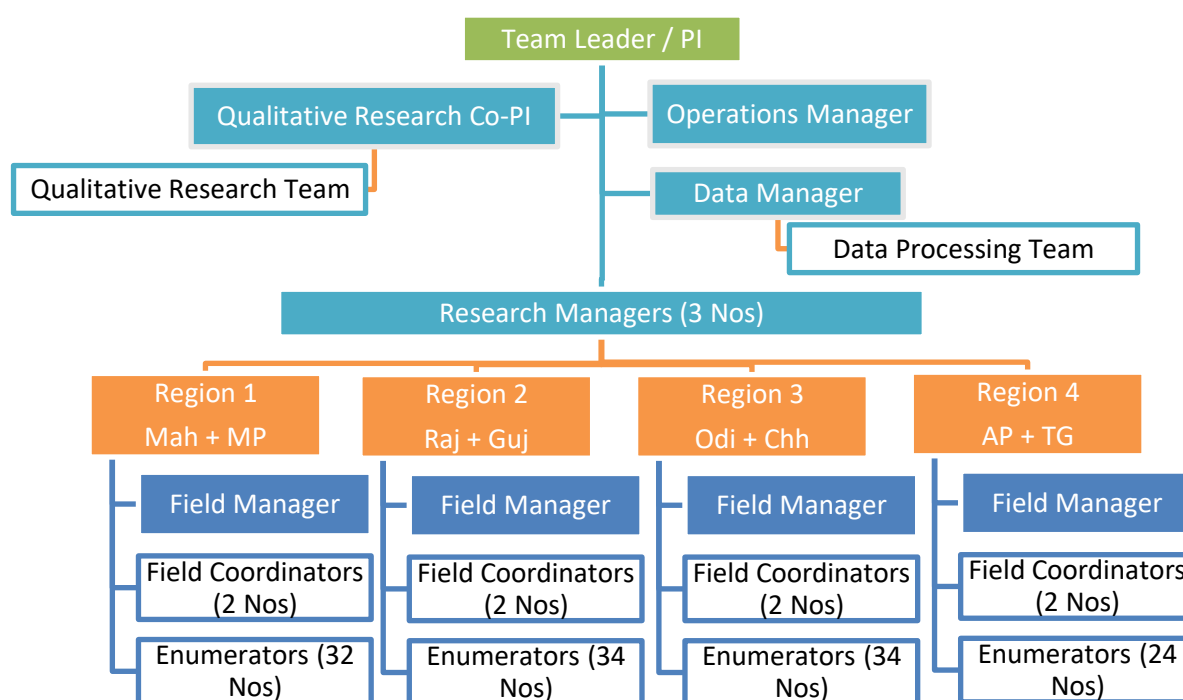
Figure 2 presents team organization and management structure for the study. The timeline for the study was challenging with less than three months available from study design to submitting the draft report. This necessitated a large field team to collect data within 3-4 weeks from 1000 schools from eight states. We divided the field teams across four regions and appointed a dedicated field manager for each region. A pair of male and female enumerators completed survey of one school in a day. In each region, we appointed two field coordinators to supervisor work of enumerators and support the field manager in logistics and reporting tasks. NEERMAN researchers were involved in training and initial field supervision.

⁴ Teachers have a perverse incentive to inflate the attendance numbers given their performance, school funding, and even necessity/redundancy of their position is tied to attendance of students. For example, if a child is reported as not attending a school for 45 days, the teacher must show that student as a drop-out and conduct efforts to re-enrol which is not only additional work burden but also shows poorly on teachers' performance. In fact, we observed during initial phases of research that children came to school late and left immediately after the MDM was served as if the only purpose was to mark themselves present on the roster and obtain MDM. We included questions to this effect in the quantitative questionnaire (when they actually come to school and when they leave school).

Thereafter, researchers coordinated between the data processing team led by a senior data manager and the field survey teams to ensure that field status reports were correct, data quality audits were communicated to the field and any errors were fixed. The data processing team continuously monitored the quality of data (outliers, tally with field report, enumerator performance assessment etc.) and processed raw data (deidentification, conversion etc.). The team leader and the qualitative researcher-in-charge provided oversight and led weekly project reviews.

Qualitative KII and IDIs were conducted by the research managers appointed for respective regions. Female researchers prioritized IDI with girls whereas male researchers predominantly conducted KIIs. When we decided to expand qualitative research to all eight states instead of four, we hired local moderators due to language constraints in Odisha and Chhattisgarh.

Figure 2. Field Management and Organization Structure



2.2.2 Training

We had planned multi-centre trainings of field teams so that training of trainers (TOT) became essential. The TOT was conducted in Mumbai for three days between 11-13 January. Along with NEERMAN staff, three WASH specialists and consultants from UNICEF Delhi also joined the TOT which helped in finalizing the measurement tools and study protocols in discussion with UNICEF specialists. Training on techniques of qualitative IDI and KII was also imparted in the TOT.

The field team trainings were conducted over a period of 6-days in Bhopal, Ahmedabad, Hyderabad and Bhubaneshwar between 17th and 22nd January. Each training was led by a researcher and a field manager and consisted of three days of in-class training and two days of field practice separated by a day of debriefing and retraining in between. Staff and consultants from UNICEF also participated in these training as observers and advisors.

2.2.3 Survey Administration

The field survey work started on 23rd January and concluded on 18th February 2019. At least one week prior to the school visit, the field managers / coordinators called the principals of the sampled schools to briefly introduce the research, to ensure that the school is open on the day of the visit, and micro-plan the field visit. The call also clarified the informed consent procedure approved by the IRB and requested the teachers to inform parents of girl students in Classes 6-10 that they may be selected for a survey, but parents could opt out of the survey by informing teachers in advance.

Upon arrival in the school for surveys, the enumerators first showed the letter from MWCD to the principal to establish credentials and requested that the team be introduced to other teachers. The male enumerator first conducted teacher's interview followed by the observation of WASH facilities in the school. Once he was done with the observation of school facilities, he copied secondary data from the school records. Parallely, the female enumerator sampled girl students from classes 6-10 as explained previously and interviewed them. For consent administration, she would confirm with teachers that the sampled girls' parents had not refused consent and additionally confirm the same with the girls. The enumerator also sought girl's assent to continue with the interview. The survey was concluded by thanking all participants and obtaining a signed survey visit confirmation form from the teachers.

CAPI data on tablets was scrutinized in the evening by field coordinators and field manager for a subset of schools every day. Additionally, the coordinator and field managers also conducted physical spot checks to ensure that the surveys were being administered as per the approved field protocol. Overall, twenty percent of the interviews received spot check or accompanied call from a supervisor (researchers, managers, coordinators). Additionally, Dr. Pratibha Singh, Ms. Koushiki Banerjee and Mr. Ram Chandra Singh from UNICEF Delhi conducted field supervision visits in Madhya Pradesh (MP), Rajasthan and Maharashtra.

At the back-office level, the data uploaded by the field was checked every 3-4 days. The data processing team compared the submitted data against the paper-based field control sheets (maintained by the field teams) to cross check field working dates and achieved sample size, and also prepared quality assessment tables to summarize response rate, extent of questions where respondent didn't know the answer, proportion of interviews which were completed too fast/late, and proportion of interviews where school records could not be merged with girl students data. These tables were reviewed by the research managers and research associates and they gave the feedback to the field manager to correct or improve performance by the field teams.

2.2.4 Qualitative Research Administration

IDIs and KIIs were performed without any glitch and yielded relevant information except for three schools in Maharashtra and Rajasthan where informal group discussions with 4-6 girls was first conducted to make the girls at ease and open up about discussing menstruation and their use of WASH facilities in school. Later, a girl who was found to be more vocal and informative was selected for the IDI.

All IDIs and KIIs were conducted after administering a formal informed consent. The parents of the girls were requested to provide a consent through the teachers as described previously and the girls' assent was also sought. KII participants were legally adults and provided their formal consent prior to their interview. Almost all interviews were audio recorded with permission of the respondent. Additionally, researchers took copious notes. All interviews were carried out in local language, were interpreted on the spot and notes including important direct quotes were recorded on the paper on the same day of the interviews. Researchers prepared summary of each qualitative interview organized around the pre-

decided themes/questions of interest and also included important quotes. Researchers referred to their notes as well as recorded audio files (if available) to verify that all important information is captured in their summary. Quotes, if any, were translated in English but transcribing a few local words as is to retain the flavour and nuance of the quotes. Qualitative researcher-in-charge, Dr Purabi Pathak-Das, conducted debriefing meeting with the researchers every other day over phone or Skype to aid cross learning among researchers and discuss what theme or inquiry needed more information or if any new theme is emerging that needed to be captured.

2.3 Analyses

2.3.1 Descriptive Analysis

The first set of analyses is preparation of frequency tables to present school characteristics, socio-economics-demographics characteristics of the girl students, factors at school and home which are generally expected to be conducive for education, and reasons for absenteeism. We present the results as frequency tables and results but do not conduct any statistical tests of significance.

2.3.2 Causal Inference Analysis

As discussed previously, the sampling strategy controlled for confounders at district and higher levels, and then the PSM further improved the match of confounders between high and low SVP rated schools. However, we had to still validate (at least partially) the assumption that we were indeed successful in identifying high and low SVP rated schools where confounders were distributed similarly. We do this by statistically testing if school and girl student level characteristics are indeed similar between the two groups of school or not as follows,

$$X_{ijk} = \alpha_o + \alpha_1 \cdot W_{jk} + pair_m \cdot district_k + \varepsilon_{ijk} \quad [1]$$

Where, X is a covariate or potential confounder of interest for girl i from school j in district k or for school j in district k ; W is an indicator variable equal to 1 if the school j is high-SVP rated and 0 otherwise; $pair$ and $district$ terms ensure that the comparison is made within a district as per the PSM pairing and then averaged over the entire sample; and ε is the error term of regression. The coefficient α_1 is the estimate of the average difference between high- and low-SVP rated schools and its statistical significance is tested at the conventional level of 0.05.

We estimated this model for more than 30 X variables and the results are reported in Appendix Table 2. These tests helped us identify the characteristics that were imbalanced and should be statistically controlled for when evaluating the effects of high-level of WinS.

Next, we verified that high SVP rating is indeed a reasonable proxy for high WinS level in the school. For this, we compared levels of multiple WASH facilities and services in the school related to drinking water, sanitation, handwashing, and waste management between high and low SVP rated school using Equation (1). As discussed in the results section, we find large and statistically significant differences between high and low SVP rated schools which strongly supports use of SVP rating as a proxy for overall WASH status of the school.

Finally, we estimated the effect of achieving a high SVP rating or high-level of WinS as,

$$Y_{ijk} = \beta_o + \beta_1 \cdot W_{jk} + \beta \cdot Z + pair_m \cdot district_k + \varepsilon_{ijk} \quad [2]$$

Where, all notations are similar to those in Equation (1) except Y is the outcome of interest at school j level (e.g., proportion of person-days lost in the last calendar month for the entire class) or at the girl i level (e.g., the number of days absent from school); Z is a set of variables which are included in the model to statistically control for the imbalance between the two groups as per the balance test results using Equation (1) or to improve precision of the impact estimate (i.e., to lower the standard error). Variables included in Z are: (1) whether school campus has a hostel facility; (2) if the school is a girls-only or co-ed; (3) additive index of school facilities such as play-ground, library, and others; (4) number of consumer assets in the girls house; (5) whether all members of the girl’s family use private toilets regularly; (6) whether the girl stays in a hostel; (7) whether the girl finds travel to school easy and very safe; (8) whether the girl is a member of any adolescent group; (9) whether the girl regularly eats MDM in the school; and (10) whether MHM counselling sessions are conducted in school at least quarterly. In case of outcome Y measured at the school j level, only the first two variables listed in Z are controlled for. The effect of high-level of WinS (proxied by high SVP rating) on the outcome of interest Y is β_l and its statistical significance is tested at the conventional level of 0.05.

We also used Equation (2) to estimate the effect of a few WASH components such as provision perennial drinking water, adequate number girls-only toilets, availability of functional handwashing station, and provision of sanitary napkins. This analysis is done to assess if any one WASH component actually had a larger effect on educational outcome which was perhaps averaged out when the overall WASH status of a school in terms of its SVP rating is used as WinS proxy.

2.3.3 U-DISE and NAS Secondary Data Analysis

As per the RFP, we were required to conduct secondary data analysis to assess if WASH level of schools is associated with educational and learning outcomes when data from all schools across India is considered. The secondary datasets used in this analysis are U-DISE and NAS district level summaries. While U-DISE data is collected at school level, it is not available publicly as a database and only as a web-report. However, PDF and Excel reports with district level summary were available on U-DISE website and used to create a district level dataset after considerable data processing. NAS report presented performance of all districts in India in a PDF report. We hired an external data entry agency to digitize thousands of pages of PDF report into Excel data base. Finally, we merged NAS and U-DISE district level datasets.

We assessed the correlation between high coverage of WASH facilities in a district with the district-level summary of educational outcomes as,

$$Y_{ks} = \beta_0 + \beta_1 \cdot T_{ks} + \beta_2 \cdot W_{ks} + \beta_3 \cdot T_{ks} W_{ks} + state_s + \varepsilon_{ks} \quad [3]$$

Where, Y is an educational outcome for district k in state s ; T is an indicator variable = 1 for year 2016-17 for which latest U-DISE data is available and 0 for pre-SVP year of 2013-14. We include this variable to control for effect of older WASH programmes carried out prior to 2013-14 because the research objectives specifically required to analyse WASH improvements under SBSV after 2014; W is an indicator variable = 1 is $\geq 90\%$ of the district schools had both drinking water and girls only toilets and 0 otherwise; and $state$ terms compare districts in the same state and then average out the effect over all states. The coefficient β_3 is the difference-in-difference estimator of the change which is associated with near universal coverage of drinking water and toilets. This analysis suffers from a well-known bias in causal inference known as “ecological inference fallacy” where inference is made about individual units (here schools or girl students) on basis of analysis of aggregated data of the groups (here districts) to which such individual units belong.[12] This analysis, therefore, at best helps in forming hypotheses about which WASH component may be more effective.

2.3.4 Qualitative Analysis

The qualitative analysis mainly consisted of organizing and synthesizing the case summaries around questions or topics of interest and those which emerged from the data. Researchers who conducted IDI or KIIs themselves prepared the case summaries as per pre-decided thematic areas and shared the excel file with the qualitative researcher-in-charge. To assess performance of researchers, the qualitative researcher-in-charge listened to audio files of 8 IDIs and 8 KIIs and cross checked with the filed case summaries. All structured case summaries were collated by the researcher-in-charge in excel sheet to better understand the similarities and variation of information captured. The information and insights were used to explain the findings from the statistical analyses or to provide more context for such findings.

3. RESULTS

3.1 Descriptive Statistics

3.1.1 Characteristics of Sampled School

Sample size achieved for different states is summarized in **Table 1** and district level details of the sample size of schools and girl students is provided in Appendix **Table 1**.

Table 3 presents summary of school characteristics across the eight states. Overall, more than 90% of the schools sampled are government and the rest are government-aided schools, but Maharashtra sample consists of 62% government schools and the rest are government aided. Over 90% of the schools have upper-primary level classes and one-third have secondary-level classes. Almost all schools were co-educational except in Andhra Pradesh (AP) and Telangana where almost 24% and 15% of the sampled schools were girls-only. Schools with residential facilities were almost negligible except in AP (21% of the schools), Telangana (17%) and Maharashtra (10%). The sampled schools have on average 76-130 girls out of 111-227 total students. When thirty-two facilities such as library, playground, computer and others were counted, on average the sampled schools had a little less than 8 facilities overall, but schools in Gujarat and AP fared slightly better.

3.1.2 Characteristics of Sampled Girls

Table 3 also summarizes socio-economic characteristics of sampled girl students. On average, girls resided in households with 6-7 members except in AP and Telangana where the average household size was closer to 5. The average number of rooms in girls' households is 3.6 across all states but girls in Rajasthan, Chhattisgarh, Madhya Pradesh (MP) and Maharashtra resided in slightly larger houses with 4 or more rooms on average. Fathers of most of the sampled girls are either cultivators or own a business or a shop. Almost one third girls reported that their father worked as a labourer. There is considerable variation across the states in availability of television, refrigerator, LPG stove, vehicles, piped water connection and individual household latrines (IHHL). Almost 90% households in AP and Telangana had television and almost 90% households in Rajasthan, Maharashtra, AP and Telangana had LPG stoves. More than two thirds of the household had a 2- or 4-wheeler in Rajasthan, MP, Gujarat and Maharashtra. Less than two thirds of the girls reported that all household members used IHHL except somewhat higher usage in MP (73%) and Maharashtra (80%). Overall, the sampled girls appear to be from reasonably well-to-do families (in rural India context) considering the number of rooms in the household, and high proportion of households with high end assets such as vehicle, television or a refrigerator.

Table 3. Characteristics of Sampled Schools#

	Rajasthan	Odisha	Chhattisgarh	Madhya Pradesh	Gujarat	Maha-rashtra	Andhra Pradesh	Telangana	All
School Characteristics									
N	138	144	141	139	133	115	134	71	1015
% of Govt Schools	99%	95%	95%	99%	87%	62%	99%	100%	92%
% of Girls-only schools	7%	0%	6%	8%	4%	0%	24%	15%	8%
% of Residential schools	2%	7%	4%	1%	3%	10%	22%	17%	8%
<i>% of Schools with following classes</i>									
Primary level	88%	69%	3%	3%	78%	87%	20%	11%	46%
Upper primary level	100%	91%	80%	77%	81%	100%	100%	100%	90%
Secondary level	36%	38%	20%	24%	23%	45%	72%	62%	38%
Higher secondary level	20%	0%	17%	4%	15%	10%	2%	0%	9%
<i>Mean number of teachers and students</i>									
Total students	144	178	144	111	227	223	207	134	172
Girl students	76	86	76	58	115	107	130	87	91
Total teachers	8.5	7.1	6.2	4.3	7.9	7.8	11.1	8.1	7.6
Female teachers	2.8	3.0	2.2	1.2	3.0	2.2	5.9	3.6	3.0
Non-teaching staff	2.3	3.3	3.6	1.1	1.4	3.0	2.8	2.3	2.5
Mean number of facilities (0-32)	6.7	8.1	5.4	5.2	10.8	8.3	10.0	8.9	7.8
Girl Student Characteristics									
N	1581	1485	1523	1432	1353	1166	1721	766	11027
Mean household size	6.7	6.2	6.6	6.8	6.5	6.4	4.8	5.2	6.2
Mean number of rooms	4.2	3.6	4.4	4.0	2.2	4.6	2.7	2.8	3.6

	Rajasthan	Odisha	Chhattisgarh	Madhya Pradesh	Gujarat	Maha-rashtra	Andhra Pradesh	Telangana	All
<i>Types of assets in the house</i>									
Television	66%	60%	71%	67%	66%	83%	91%	89%	73%
Refrigerator	42%	17%	14%	16%	36%	34%	23%	19%	25%
LPG connection	95%	68%	75%	77%	55%	87%	92%	93%	80%
Scooter, Car, etc.	71%	41%	56%	61%	67%	71%	47%	43%	57%
Tap water connection	39%	22%	20%	51%	80%	72%	42%	56%	46%
% of household using IHHL	57%	49%	66%	73%	58%	80%	56%	54%	61%
<i>Occupation of girls' father</i>									
Cultivator	27%	31%	40%	42%	51%	49%	27%	46%	38%
Labourer	33%	25%	38%	32%	17%	18%	50%	30%	32%
Business/shop	22%	17%	10%	14%	17%	11%	11%	8%	14%
Job	13%	13%	6%	7%	10%	16%	3%	3%	9%
Don't work	1%	1%	1%	2%	0%	1%	1%	2%	1%

Note, the study design would yield a homogenous sample for confounder control which is not necessarily the same as representative cross-sectional sample of all schools.

3.1.1 Access to Schools and Enabling Environment

The girls were asked a series of questions on their access and travel to school as well as enabling environment that would be conducive to attending the school and achieving better educational outcomes. The results are summarized in **Table 4**.

Most of the girls lived close enough to walk to the school and about 10% of them stayed in a hostel attached to the school. The average time taken to travel one-way to the school ranged from 11 minutes in Odisha to 19 minutes in Rajasthan. We imputed the perception about the ease of travel and safety/security during the transit to school on basis of a series of questions and find that almost three-fourth of the sampled girls perceived their travel as, both, easy and safe, except in AP and Telangana where this proportion was lower at 56% and 64%, respectively.

Nearly every surveyed girl answered affirmative to questions related the motivation and support given by her parents to attend the school. Over 80% of the surveyed girls felt that their teachers also supported them in their academics and motivated them to attend the school; this proportion is slightly lower only in Chhattisgarh (79%). On the other hand, while 59% of the surveyed girls in Odisha reported that teachers sometimes discourage them from attending the school for non-Bonafede reasons, this proportion was overall just 14%. Adolescent groups such as *Sabla* group or *Kishori samooh* are used as platforms for their empowerment and to impart them life skills. More than one-thirds (36%) of the surveyed girls were member of some adolescent group and this proportion was especially high in MP (54%) and Gujarat (59%), and lowest in Odisha (22%), AP (17%) and Telangana (16%). Finally, provision of mid-day meals (MDM) in schools is expected to be both a nutrition intervention as well as an incentive to attend the elementary school. Almost 80% of the girls reported receiving MDM in schools regularly which is expected because the sample includes private schools and schools with secondary and higher levels where MDM as a scheme is not applicable. Overall, the non-WASH conditions conducive to encourage attendance in schools appear to be widely prevalent.

3.1.2 Stated Reasons for Attending and Missing the School

We asked to the sampled girls to list the factors that motivate them to attend the school and common reasons they remain absent from the school. Their responses were coded into different categories as summarised in **Table 4** and **Figure 3**. Almost three-fourths of girls reported aspirational reasons linking education with better life and opportunities, followed by teachers or teaching related reasons (58%) and friends related reasons (44%). Better availability of WASH facilities in schools or better access to sanitation than their homes were also reported as motivating factors for attending the school by 17% of the girls overall; highest proportion being in Maharashtra (31%).

On the other hand, illness (30%) and social functions (39%) were the most common reason for missing the school whereas almost one-fourth of the girls also reported that household chores or some economic activity were the reasons they miss the school. Household chores and economic activities were more prominent reasons in Chhattisgarh (35%) and MP (44%). None of the girls reported poor or inadequate WASH facilities or services as a reason for missing the school. Even missing schools during menstruation was cited by less than 5% of the girls except in AP where 11% of the girls reported missing school during menses.

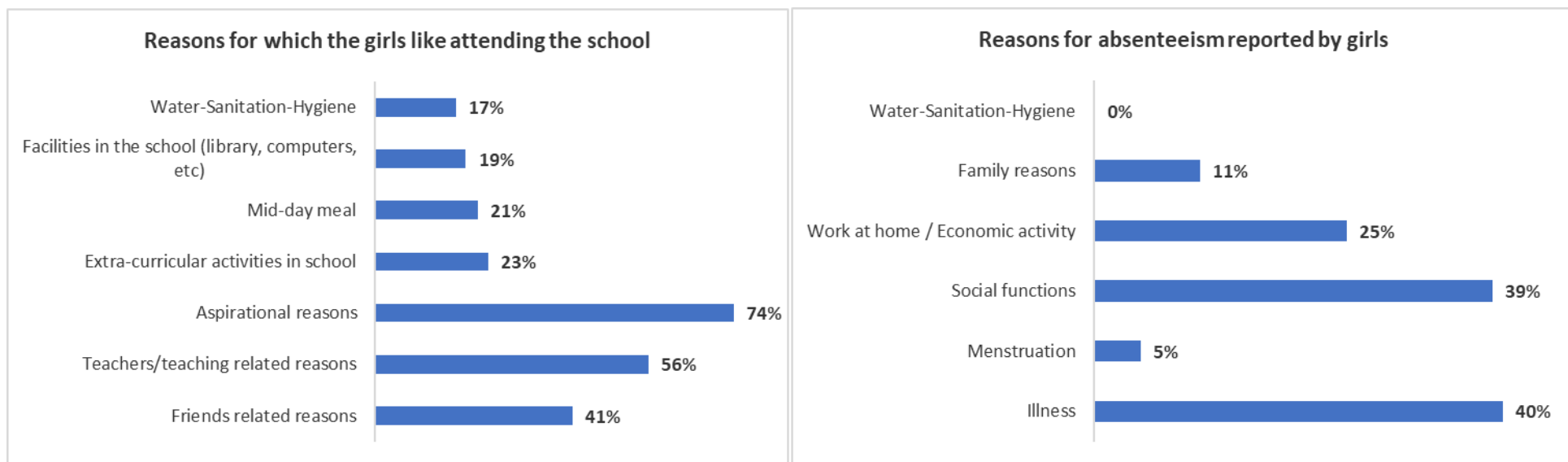
In addition to above reasons, qualitative research (Section 3.4.1) identified presence of female teachers as a driver and eve teasing and harassment by boys in class or enroute school as a barrier, but WASH facilities in school were rarely mentioned during despite specific probes.

Table 4. Access to Schools, Enabling Environment, and Stated Reasons for Attendance and Absenteeism

	Rajasthan	Odisha	Chhattisgarh	Madhya Pradesh	Gujarat	Maharashtra	Andhra Pradesh	Telangana	All
N	1581	1485	1523	1432	1353	1166	1721	766	11027
Access to School									
% who stay in a hostel	2%	8%	6%	2%	5%	9%	25%	21%	10%
% who walk to school	87%	72%	83%	80%	88%	84%	78%	91%	82%
Mean one-way travel time to the school (minutes)	19	11	20	17	17	16	12	12	16
% who find travel to school easy and safe	79%	79%	81%	88%	81%	69%	56%	64%	75%
Enabling Environment									
% whose parents actively support her education	100%	100%	100%	100%	99%	100%	99%	99%	99%
% who believe that all teachers actively support her education	81%	91%	70%	75%	89%	87%	77%	84%	81%
% of who perceive that they are sometimes discouraged from attending the school	5%	59%	10%	2%	8%	13%	8%	10%	14%
% of who are member of any adolescent group	44%	22%	35%	54%	59%	39%	17%	16%	36%
% of who get MDM regularly	74%	78%	81%	77%	75%	66%	89%	94%	79%
Categories of reasons for attending the school									
Friends related reasons	24%	66%	43%	28%	38%	45%	53%	16%	41%
Teachers/teaching related reasons	40%	69%	50%	35%	64%	68%	68%	56%	56%
Aspirational reasons	92%	63%	82%	95%	64%	69%	53%	69%	74%
Extra-curricular activities in school	20%	38%	16%	23%	41%	2%	28%	9%	23%
Mid-day meal	24%	31%	23%	19%	17%	21%	19%	7%	21%
Facilities in the school (library, computers, etc)	19%	8%	30%	5%	10%	49%	22%	4%	19%
Water-Sanitation-Hygiene	19%	16%	11%	12%	17%	31%	16%	10%	17%
Categories of reasons for absenteeism or missing schools									
Illness	38%	52%	44%	33%	32%	38%	45%	38%	40%

	Rajasthan	Odisha	Chhattisgarh	Madhya Pradesh	Gujarat	Maharashtra	Andhra Pradesh	Telangana	All
Menstruation	2%	8%	3%	3%	2%	4%	11%	2%	5%
Social functions	48%	32%	32%	41%	36%	44%	41%	49%	39%
Work at home / Economic activity	29%	15%	35%	44%	32%	11%	17%	8%	25%
Family reasons	10%	8%	14%	23%	4%	16%	2%	1%	11%
Water-Sanitation-Hygiene	0%	0%	0%	0%	0%	0%	0%	1%	0%

Figure 3. Reasons Reported by Surveyed Girls for Attending and Missing Schools.



3.2 Results from Causal Inference Analysis

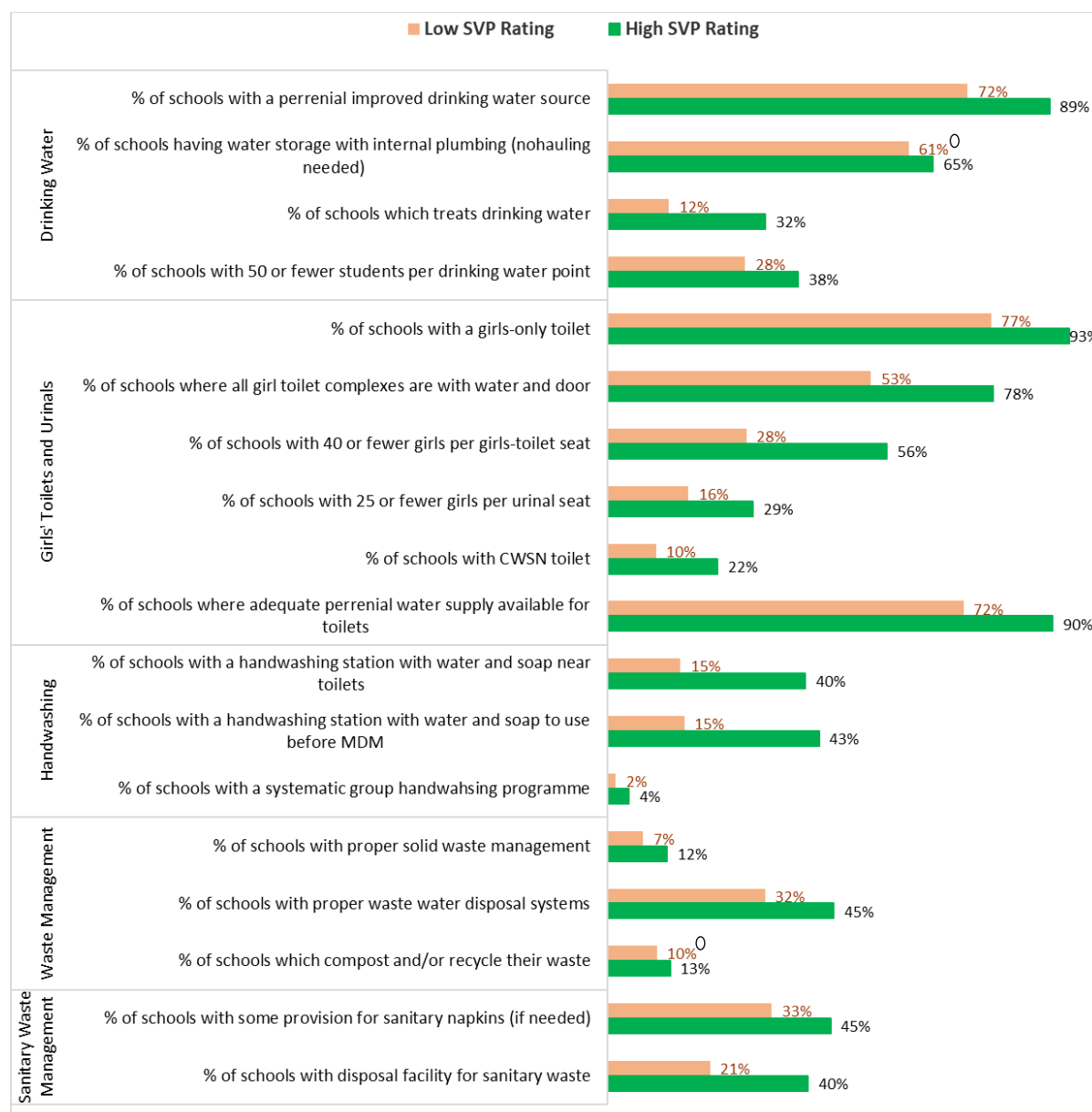
3.2.1 Validating SVP Rating as a Proxy for WinS Level

The study design expected us to use SVP rating as a proxy for high or better WinS. Therefore, it becomes important to validate this assumption before we proceed with evaluating the effect of high WinS on educational outcomes. **Figure 4** presents various indicators related to drinking water, girls' toilets and urinals, handwashing, and waste management on basis of school observations by enumerators and interviews of the teachers. We present the % or mean of these WASH indicators by "High SVP rated" schools (those which scored 5-star rating or 4-star rating with good MHM score as discussed previously) and "Low SVP Rated" schools (those which scored 1-star rating or 2-star rating with poorer MHM score). All except two variables listed in Figure 4 were statistically significantly different between the high- and low-SVP rated schools at statistical significance level (α) of 0.05 with a two-sided test (test conducted using Equation 1 to account for matching).

High SVP rated schools indeed have better levels of any WASH indicator compared to the levels in the low SVP rated school. Therefore, data supports the assumption that SVP rating is a good proxy for overall WinS level. For example, compared to the levels in Low SVP rated schools, almost all High SVP rated schools had perennial source of drinking water (89% vs 72%), significant number treated the drinking water on site (32% vs 12%), had a girls only toilet (93% vs 77%), had a girls toilet complex with water and privacy screen (door) (53% vs. 78%); had adequate number of toilet seats with 40 or fewer girls per toilet seat (56% vs 28%), had a fully functional handwashing station with water and soap to use after toilet use (40% vs. 15%), and facility for provision of sanitary napkins (45% vs. 33%) and their disposal (40% vs. 21%).

While high-SVP rated school fare relatively better than low-SVP rated schools, in absolute terms, for most of the WASH indicators in **Figure 4**, less than half of the high SVP schools could actually meet the criteria for high level. Only three WASH indicators – availability of a perennial source of drinking water, availability of girls only toilets, and availability perennial water supply for toilets – were found to be present in 90% of the high SVP rated schools. However, more than 70% of the low SVP rated schools also met requirements for above three indicators. Especially for indicators related to waste management, hand-washing and sanitary waste management, not even half of the high-SVP rated schools met the criteria. The main implication of this finding is that SVP assessment and rating done by the district and state governments needs to be much more robust and objective by focusing on all aspects of WinS and not just toilets and drinking water.

Figure 4. Comparison of WASH Facilities between High- and Low-rated SVP Schools

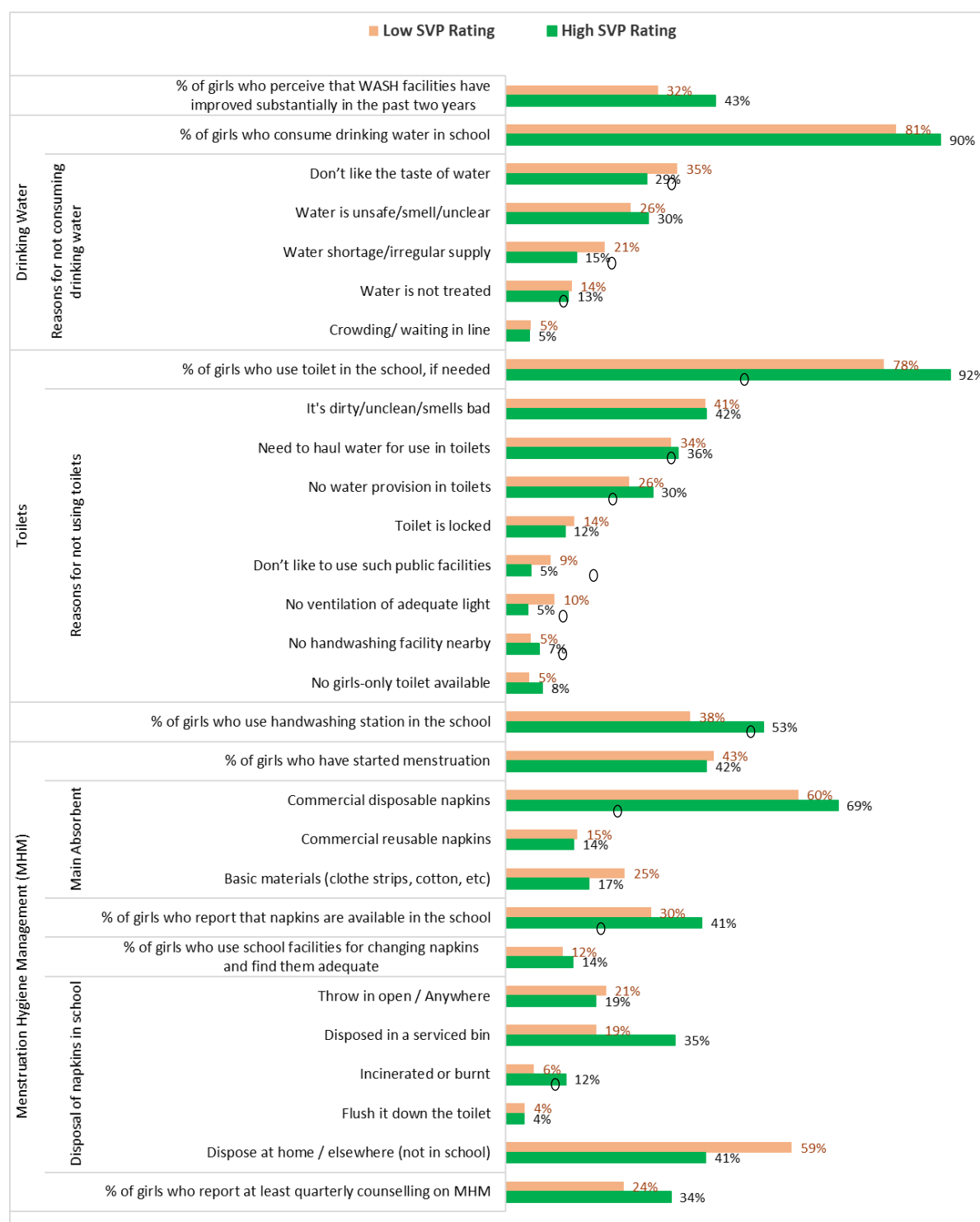


Note: All indicators are statistically significantly different at $\alpha = 0.05$ except the indicators hyphenated by ⁰.

3.2.2 Differences in WASH Practices in High- and Low-rated SVP Schools

The causal pathway presented in Figure 1 doesn't just require that schools have better WinS services for students but that the students actually use and benefit from these. Therefore, we also assessed whether girl students have better utilization of various WASH services in high SVP rated schools. In **Figure 5**, we present the use of and reasons for lack of the use of drinking water and toilet facilities in the school, handwashing practices and MHM related practices by high and low SVP rated schools. All presented variables were tested for group mean difference using Equation (1); the differences that were *not* statistically significant at $\alpha = 0.05$ are noted in **Figure 5**.

Figure 5. WASH Practices of Girl Students in High- and Low-rated SVP Schools



Note: All indicators are statistically significantly different at $\alpha = 0.05$ except the indicators hyphenated by ⁰

More girls from high SVP rated schools perceived that the WASH facilities have overall improved substantially over the past two years than girls from low SVP rated schools (43 vs 30%). We also find modestly higher use of WASH facilities and better WASH practices among the girl students from high SVP rated schools than those from low SVP rated schools in terms of use of drinking water (90% vs.

81%), the use of toilets (92% vs. 78%) and handwashing after the use of toilets (53% vs. 38%), higher availability of disposable sanitary napkins in the schools (41% vs. 30%), higher use of disposable sanitary napkins (69% vs. 60%), and quarterly MHM counselling in school (34% vs. 24%). Disposal of used sanitary napkins in schools in the service bin (35% vs. 19%) or in an incinerator (12% vs. 6%) is also more prevalent in high SVP rated schools.

We also elicited the reasons for not using drinking water facility or toilets in school when required to assess if the reasons differ between high- and low-SVP rated schools. As presented in **Figure 5**, the reasons are practically the same in both groups of schools – even the differences which are statistically significant are small in magnitude.

Overall not only do high SVP schools have better WASH facilities and services, their utilization as well as appropriate WASH practices are more prevalent in these schools. However, the difference between the high- and low-SVP rated schools is often modest which suggests that even low SVP rated schools are able to provide basic WASH services to their students.

3.2.3 Balance Test for Potential Confounders

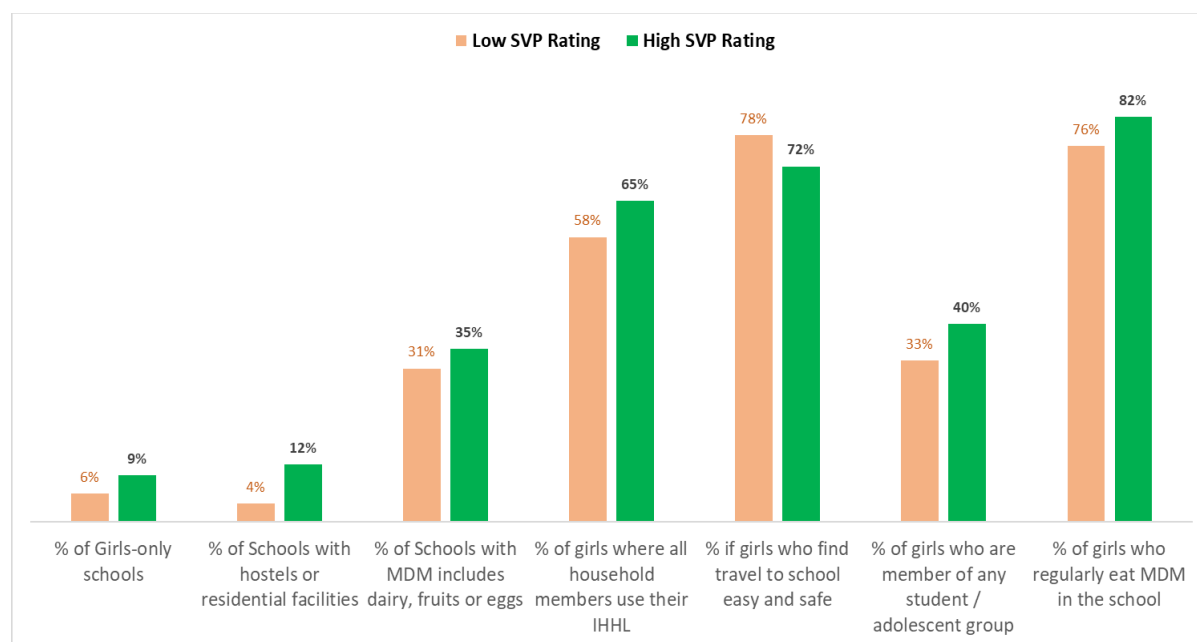
As discussed in Section 2.1.1, confounders are factors correlated with, both, high SVP rating (or high WinS levels) and the educational outcomes of interest. Not controlling for confounders can result in spurious correlations or mask true impacts of the intervention. We have already controlled for time-invariant confounders at district-level and higher. Further, we used six school level characteristics to match high- and low-SVP rated schools in a same district. However, we still need to at least partially test whether the school and girls' characteristics are similar between the two groups of school to give us some confidence that perhaps unmeasured confounders are also balanced. We tested for twelve school level and 19 girl-student level variables using Equation 2.

The results of this balance test with 31 variables are presented in Appendix Table 2. Of these 31 variables, 18 variables were found to be statistically significantly different at $\alpha < 0.05$, but the magnitude of the difference was practically meaningful in seven. **Figure 6** presents these seven variables where the difference between high- and low-SVP rated schools is large in magnitude as well as statistically significant at $\alpha < 0.05$.

Compared to low SVP rated school, higher proportion of high SVP rated schools are girls only, have a hostel facility, and serve special foods such as fruits and eggs in MDM. Higher proportion of girls from high-SVP rated schools report that all household members use IHHL, find their commute to the school easy and safe, are members of an adolescent group, and regularly consume MDM at school. These factors can also influence attendance of a girl child and therefore suggest that presence of confounders at school and girl student level cannot be ruled out. Qualitative research findings summarized in Section 3.4 also identified that high SVP rated schools have other drivers of attendance and continued enrolment such as quality teachers, ease of access, non-WASH school facilities and community norms that prioritize education.

Therefore, to further control for effect of confounding we control for ten potential confounders and covariates (two at school level and eight at girl student's level) which can confound the association between high SVP rating and educational outcomes are included in Equation (2) as explained in Section 2.3.2.

Figure 6. Imbalance in Key Confounders between High and Low SVP Rated Schools



Note: 31 variables were tested for balance of which 18 were statistically significantly different at $\alpha = 0.05$. However, we found that the magnitude of the difference was large enough in seven of these 18 and report only those in this figure. Refer to Appendix Table 2 for a complete set of results.

3.2.4 Impact of High Level of WinS on Absenteeism

This section presents the results for the primary outcome of interest – absenteeism of girl students. We measured absenteeism through the official school records as well as recall by girl students as discussed previously.

First, we present estimated association between absenteeism indicators constructed using the school records and high SVP rating of the schools. We had sampled one class in each grade between 6 and 10 available in a school and copied the attendance roster data to determine extent of absenteeism. The top panel of **Figure 8** presents results for % of person-days lost in the last calendar month estimated using Equation (2) with school level confounders in Z . This indicator is a ratio of total per-days lost to total per-days the school was operational. We find that the absenteeism reduced by 4%-points in Grade 10 and 2%-points in Grade 6 (significant at $\alpha = 0.05$), but there was no reduction in other grades. In the bottom panel of **Figure 8**, a slightly different absenteeism indicator – % of girls in the sampled class who missed 6 or more days is presented. This indicator is a ratio of the number of girls who missed 6 or more days to the total number of girls listed in the roster. We again find reduction of 4%-points in Grade 10 and 3%-points reduction in Grade 8 (significant at $\alpha = 0.05$), but no reduction in any other grades.

In **Table 4**, we present the results for absenteeism measured at the girl student’s level (not at the school level as in Figure 8). We had pre-specified that the absenteeism recall by the girl students will be the primary indicator for absenteeism and all other measures of absenteeism will only be supportive. We asked the sampled girls to recall the number of days they missed the school in the last calendar month, the number of days they typically missed the school during menstruation, and the number of days they lost to any illness in the past three months. We find statistically significant but practically negligible effect of high SVP rating on the number of days missed in the last calendar month – only 0.13 days of absenteeism in a month could be reduced with high level of WinS.

Figure 7. Association of High-Rated-SVP Schools with Absenteeism in the Last Calendar as per School Attendance Records



Table 4. Absenteeism among sampled girl students as per the recall by students and their attendance record

	Low SVP Rating		High SVP Rating		Adjusted Group difference (T-C)	
	N	Mean	N	Mean	Mean / %	p-value
Mean number of days the sampled girls missed school in the last calendar month <i>(Recall by girl students)</i>	5419	2.43	5608	2.11	-0.13	0.036
Mean number of days the sampled girls typically miss schools during menstruation <i>(Recall by girl students)</i>	2331	0.61	2328	0.55	0.01	0.870
Mean number of days the sampled girls missed schools because of any illness in the past 3 months <i>(Recall by girl students)</i>	5419	1.30	5608	1.25	-0.04	0.534
Mean of proportion of days the sampled girls missed the school in the last academic year <i>(school records)</i>	4346	17%	4488	15%	-2%	0.000

We had also collected school records for the sampled girls (if available) on the number of instructional days in the last academic year and the number of days the girls actually attended the school in that academic year. Although this is not a recall data by girls, we present the results in **Table 4** to assess if higher WinS is associated with absenteeism over a longer period instead of just a month. On average sampled girls in low SVP rated schools missed 17% of the days whereas high SVP rating is associated with a negligible reduction of 2 %-points (statistically significant at $\alpha = 0.05$).

Considering the results presented in **Table 4** and **Figure 8** collectively, there is no evidence that higher levels of WinS indicated by high SVP rating is associated with reduced absenteeism. Statistically, when multiple alternative indicators for an outcome are tested, it is not uncommon for a few of them to be statistically significant by chance, and indeed we do find negligible yet statistically significant effects of high WinS on absenteeism indicators constructed using school records data. However, without consistent effects across other indicators, perhaps there is no causal link between high WinS level achieved under SBSV/SVP once other confounders that drive the attendance are controlled for.

3.2.5 Impact of High Level of WinS on Exam Performance

A secondary research objective of the study was to assess if higher levels of WASH measured in the SVP are associated with better learning outcomes. We don't have any reliable data on learning outcomes for the sampled students so that we had to rely on their last years examination performance as a proxy for learning outcomes. From school records, we obtained data on percentage of students in different grades who passed to the next grade in the last academic year. Additionally, for each of the sampled girl, we obtained data on her performance in the annual examination in the last academic year. If the examination score was available in terms of percentage and not as a letter grade, then it was used as an indicator to assess exam performance as reported in **Table 5**.

Table 5. Effect of High SVP-Rated School on Exam Performance of Sampled Girls

	Low SVP Rating		High SVP Rating		Adjusted Group difference (T-C)	
	N	%	N	%	%	p-value
% of Girls who passed to the next grade last year as per school records						
Grade 6	432	99%	456	99%	0%	0.588
Grade 7	430	99%	455	99%	0%	0.810
Grade 8	390	99%	397	99%	0%	0.572
Grade 9	196	93%	189	92%	2%	0.277
Grade 10	194	86%	181	87%	-3%	0.253
Annual Exam performance of sampled girl students in the last academic year as per school records						
Mean score in mathematics	3938	62%	4144	64%	2%	0.000
Mean score in science	3932	64%	4132	66%	2%	0.000
Mean score in language	3939	66%	4144	68%	1%	0.001

Overall, almost everyone is passed to the next grade as per the school records which is not surprising given the erstwhile policy of SSA of not failing any child. Even in Grade 10 where an external board exam is conducted at a state level, we find that >85% of the girls passed last year. There is no difference in passing percentage of girls between high and low-SVP rated schools. Using the girl-

specific examination scores, we find statistically significant but practically negligible increases of 1-2 %-points in average exam score in high SVP rated school over the average score of 62%-66% in low SVP rated schools in mathematics, science and main language.

3.2.6 Effect of Different WASH Components on Educational Outcomes

The study design also postulated that perhaps using a composite index for WinS level such as the SVP score may mask or average out the effect of a specific WASH component such as drinking water or toilets. Therefore, using Equation (2), we evaluated the effects of high level of improvement in different WASH components such as (a) schools with a perennial drinking water source with adequate drinking water points (<50 students per point), (b) schools where all girls-toilet complexes have water and privacy door with adequate number of seats (≤ 40 girls per seat); (c) schools with properly constructed handwash Stations with soap and water for use after toilet visit and before meals; and (d) schools which have provisions for sanitary napkins and their safe disposal, both. The results for key absenteeism and exam performance indicators are presented in **Table 6**. For each of the above four WASH components, the first column is the mean value of the indicators in schools “without” the specified WASH component, the next column is the increase or decrease in the mean value of the indicators in schools “with” the specified WASH component, and the third column is the p -value of this change. The results are usually statistically not significant, and when significant, they are of small magnitudes. Sometimes, we even find negative or ill effects of specific WASH components except the handwashing component where we find weak but at least somewhat consistent effects across multiple indicators related to absenteeism and exam performance.

Table 6. Effect of Improvements in Different WASH Components on Absenteeism and Exam Performance of Sampled Girls

	Perennial and Improved DW Source with <=50 students per DW point			All girls-toilet complexes have water and door with <=40 girls per seat			Handwash Stations with Soap and Water available for use after toilet visit and before meals			Facilities for sanitary napkin provision and disposal, both		
	Level without ↑	Change with ↑	p-value	Level without ↑	Change with ↑	p-value	Level without ↑	Change with ↑	p-value	Level without ↑	Change with ↑	p-value
Absenteeism among sampled girl students as per school records and recall by students												
Mean proportion of days sampled girls missed in the last academic year (school records)	16%	-1%	0.036	16%	0%	0.833	17%	0%	0.366	16%	1%	0.142
Mean number of days the sampled girls missed school in the last calendar month	2.16	-0.15	0.036	2.26	0.10	0.133	2.41	-0.27	0.000	2.43	-0.24	0.004
Mean number of days the sampled girls typically miss schools during menstruation	0.53	0.12	0.013	0.56	0.13	0.001	0.61	-0.04	0.322	0.66	-0.06	0.175
Mean number of days the sampled girls missed schools because of any illness in the past 3 months	1.20	0.07	0.305	1.27	0.03	0.679	1.32	-0.17	0.014	1.31	-0.02	0.831
Annual Exam performance of sampled girl students in the last academic year as per school records												
Mean score in mathematics	62%	1%	0.013	62%	0%	0.660	62%	1%	0.003	63%	-1%	0.027
Mean score in science	65%	1%	0.067	64%	1%	0.054	65%	1%	0.004	65%	0%	0.421
Mean score in main-language	66%	1%	0.052	66%	1%	0.133	66%	2%	0.000	66%	1%	0.282

3.3 District Level Analysis using U-DISE and NAS Secondary Data

The research objectives and proposed study design required us to analyse secondary data to assess if better WinS and educational outcomes are associated when pan-India data is used and not just the SVP applicant schools. As discussed previously, such secondary data from U-DISE and NAS was publicly available at the district level. Using Equation (3), we evaluated the association between high district-level coverage (>90%) of both drinking water and girls' toilets (constructed using U-DISE) on educational outcomes such as enrolment of girl students, and ratio of girls passing between different grades (both from U-DISE) and learning outcomes summary for Grade 8 students for multiple subjects (from NAS). From U-DISE website, we downloaded district reports for Years 2013-14 and 2016-17. From published NAS district level reports, we created a district level dataset with score details for Standard 8. We merged these datasets to create a dataset for 652 districts across India to explore association or correlation between high coverage of drinking water and girls only toilets in a district and educational outcomes in the district.

The results of this analysis are presented in **Table 7**. We find no meaningful change in the number of girls enrolled in districts with $\geq 90\%$ coverage of girls' toilets in upper primary or higher schools and $\geq 90\%$ coverage of drinking water across all schools in the district. We also don't find any difference in most of the transition or retention ratios of girl students between different grades. The bottom panel of **Table 7** presents the association between high drinking water and toilet coverage in a district with NAS learning outcome scores – we find no statistically significant associations.

Above findings are not surprising given the data is at the ecological scale of a district and the differences between the schools within a district are averaged out. The WASH indicators in U-DISE are also too generally defined and are limited in numbers to create more nuanced gradation of WASH level in a district. Finally, the data on enrolment and transition can suffer from multiple biases due to the policy of not failing students especially in lower grades^{5 6}.

⁵ I haven't seen some children coming since ages, yet their names are retained in the school register. Half of the children never have come to school this year.- IDI, Class VIII, Bhopal, MP

⁶ All children irrespective of examination results graduated to this standard from standard sixth. There is no dropout this year. However, from fifth to sixth standard some children dropped out, but she does not know what was the reason. Usually dropout is prominent only after 12th standard.- IDI, Class VII, Ghasipura, Jaipur, RJ

Table 7. Association between Near Universal Coverage of Girls Toilets and Drinking Water, Enrolment and Transition of Students, and Learning Outcomes of Students (UDISE and NAS Secondary Data Analysis)

	Low Coverage	High Coverage	Change (High - Low)		Adjusted Change (High - Low)	
	Mean	Mean	Mean	p-value	Mean	p-value
U-DISE Outcomes related to Enrolment and Transition						
N	180	472				
Number of girls enrolled in elementary	129923	137578	210	0.914	-661	0.723
Ratio of number of girls in Grade 6 to those in Grade 5 in the same year	0.93	0.96	0.02	0.034	0.02	0.043
Ratio of number of girls in Grade 7 to those in Grade 6 in the same year	0.98	1.01	0.00	0.427	0.00	0.474
Ratio of number of girls in Grade 8 to those in Grade 7 in the same year	0.97	0.98	-0.01	0.238	-0.01	0.211
Ratio of number of girls in Grade 6 to those in Grade 5 last year	0.87	0.92	0.02	0.046	0.01	0.104
Ratio of number of girls in Grade 7 to those in Grade 6 last year	0.92	0.97	0.01	0.026	0.01	0.089
Ratio of number of girls in Grade 8 to those in Grade 7 last year	0.93	0.96	0.01	0.028	0.01	0.103
Ratio of number of girls repeating Grade 8 to those in Grade 8 last year	0.01	0.00	0.00	0.912	0.00	0.888
Performance of Class 8 Students in National Achievement Survey 2017-18						
N	180	472				
Mean score in language (%) in rural school	52	56	0	0.867	-1	0.178
Mean score in language (%) for girls	54	57	-1	0.137	-1	0.106
% of students whose language score is > 75%	19	23	-1	0.171	-1	0.145
Mean score in maths (%) in rural school	41	41	0	0.691	-1	0.198
Mean score in maths (%) for girls	41	41	0	0.544	-1	0.444
% of students whose maths score is > 75%	9	9	0	0.749	0	0.589
Mean score in science (%) in rural school	42	43	0	0.694	-1	0.213
Mean score in science (%) for girls	42	43	0	0.567	0	0.499
% of students whose science score is > 75%	9	10	0	0.599	0	0.546
Mean score in social-studies (%) in rural school	42	43	0	0.809	-1	0.292
Mean score in social-studies (%) for girls	42	43	-1	0.474	-1	0.441
% of students whose social-studies score is > 75%	9	10	0	0.963	0	0.947

3.4 Qualitative Research Findings

3.4.1 Main Drivers for Attendance and Absenteeism

In general researchers didn't find any cases or narratives for dropouts beyond 1-2 students in the school or substantial extent of absenteeism; perhaps for reasons such as policy of no-retention until upper primary sections, mandatory requirements for reporting and then counselling of children who drop out (and hence added work burden), and mandatory minimum attendance norms that students must fulfil and which also reflect on performance of the school/teachers. Therefore, almost no one we talked to flagged drop-out or absenteeism as an important problem in their schools. Therefore, the research team identified the reasons behind even the minor absenteeism or rare drop-out events.

One of the most frequently cited reason why children don't come to school was **absence of drive** - "They just don't like the burden of studying and don't like to come" was a common reason most of the interviewed girls and teachers gave for a few students who missed schools regularly^{7 8 9}. Almost all teachers and girls voiced unanimously that girls are more regular in schools than boys, they are more attentive in their studies and active in all extra-curricular activities. However, this is more likely in case of younger girls. As girls grow up, there is expectation of taking on more responsibilities for household chores and work more so than what is expected of boys at the same age. On the other hand, older boys start becoming more regular. However, we must also report that several girls we talked to had **great aspirations and had a strong drive to continue education**. For example, in Maharashtra, girls were eager to secure a formal job in the government sector and felt that education is more necessary for girls than boys which often get the family inheritance and manual labour job in industries much easily than girls.

Other most common reasons were related to **coming of age and the safety concerns as well as social norms and expectations that come with it**. Menarche is one of the reasons that leads to a common believe that girls are grown up and their movements get restricted including going to school. This is sometimes imposed by family members and sometimes the girls themselves feel that they must behave in sanctioned manners after they grow old¹⁰. They start becoming self-conscious about their cloths, their changing appearance and feel shy to talk to their fellow-friends. This is the age when they transition from upper primary to secondary and from secondary to higher secondary schools, and

⁷ For boys there are no specific reasons why they don't come to school. Today all girl's have come to school but there four boys absent, Eek toh kanche khel raha tha, aur dusra aise hi dol raha tha, do ka koi pata nehi. Who log faltu karan se school nehi ate, kabhi kabhi bolte hai kapde gande the, isiliye nehi aya."- IDI-Class VII, Ghasipura, Jaipur, RJ

⁸ "My own cousin has stopped coming to school for ever but she simply doesn't have the drive to come. Her parents never stop her, neither there is any reason why she stopped; she stays at home only"- IDI-Class VII, Ghasipura, Jaipur, RJ

⁹ A few girls who don't come regularly, don't come simply because they are not interested in studies. One girl named 'Karina' (name changed) bunks a lot, her parents don't say anything, but she does not come on her own; she goes to agricultural fields to work. - IDI-Class IX, Paldi, Jaipur, RJ

¹⁰ Life changes after period the girl's starts feeling that she has grown up, and also the girl can get pregnant after she gets her periods.- IDI, Class VII, Mahasamund, CG

perhaps a key for girls to drop out in these grades without any supporting environment – their parents restrict them, their brothers are vigilant¹¹, their male classmates become more mischievous¹², the roads are not considered safe¹³, they live in fear of eve teasing^{14 15 16 17}. Exposure to media has further exacerbated the issue by creating a perception that girls are not safe or can commit costly mistakes^{18 19 20 21 22}.

A related and a very common reason for temporary absence from school is **menstruation related** as consistently found in the reviewed WinS research as well (see Section 1.1). Across all states, girls

¹¹ *Pehle mein bhi roj school ati thi par aaj kal school ane hi kaun dete hai?. Ghar se sara kaam karke late ati hun-eek baje, aur teen baje chali jati hun. Bhai log bhi ghar jake bolte hai, school mein padhai hoti kaha hai, school mein toh itni tej gaddar ho rahi hai. Tum school mein kya padhne jati ho?." IDI, Class VIII, Bhopal, MP*

¹² *"School toh isiliye ate hai ki ayenge to kuch likh padh lenge, par yah koi padhai nehi hoti. The teachers have no control over these boys. Whenever, we speak in the class they start laughing. It makes me upset"- IDI, Class VII, Bhopal, MP*

¹³ *Roads are not safe, we feel scared so it is another reason why we come to school in group.- GD com IDI- Class IX, Paldi, Jaipur, RJ*

¹⁴ *"Girls have no rights to have dreams in this village. People are bad. They don't send their daughters to school in the fear of teasing from boys. Even if some girl comes to school people, especially the elderly, ask our parents to stop their grown-up daughters going to school." – IDI, Class VIII, Bhopal, MP*

¹⁵ *We stay at 3 Kms distance and we walk; on our way to school there are some boys who tease us and also bully us by calling us in our fathers name and all. That is the only problem we face.- IDI, Class VIII, Mahasamund, CG*

¹⁶ *Boys tease girls a lot. The boys here are very wicked, teacher say nothing to them. This is why people don't send their daughters to school. I go home after lunch for an hour after lunch at school, just because boys are too naughty and we can't stay here. I come back again" – IDI, Class VIII, Bhopal, MP*

¹⁷ *"Here the environment is not good, the boys are not good. They don't say anything but there is a feeling of uneasiness. When they look at us, it feels that their intention is not good.- IDI-Class X, Raisen, MP*

¹⁸ *"Once the girls achieve the menstruation cycle, the parents are worried that the girls might do something in the school which is socially unacceptable since this is a slippery age and due to early maturity, internet access, information is easily available. The kids start getting involved in sexual activities at a very early age and they prefer to keep their girls at home".- KII, Male teacher, Ashram School, Aravali, Gujarat*

¹⁹ *Now with media, news from far flung areas is coming to our village. People were very simple earlier, now TV, mobile has screwed their thoughts. Everyone now fears that daughters will fly off with some boy"._IDI, Class VIII, Bhopal, MP*

²⁰ *After VII out of 30-35 girls in a class 5-6 girls stop going to school because the higher schools are far away, they are scared of girl's safety and also very poor to manage their expenses, there is no proper arrangement for commuting. Also, they think grow up girls may do wrong things, may fall in boys trap and fly away. With mobile use this is becoming viral. Boys take the girls away spoil them and leave them. Villagers are scared that their girls will be spoiled. There have been a few cases in last 2-3 years. - KII, female teacher, Nashik, MH*

²¹ *But those who are not good in character, parents are a bit apprehensive to send such girls to school since they may commit some mistake and ruin family's name. I have seen such thing happening in my village but it has happened in neighbouring places. And such things get spread very easily. People give examples of such things (from media) and prevent girls from going to school if she shows no interest in studies. Now with media exposure these things have intensified. "Log TV mein cheejo ko dekhte hai aur batein karte hai, matlab ki ekk baat ka char hona".- IDI, Class IX, Ghasipura, Jaipur, RJ*

²² *Girls have a lot of work at home and fields, so don't go to school. Till 10th standard some girls go to school, some don't. Some are asked by family members not to go to school because they grow up. Girls do wrong things, they do boy-friend-girl-friend, they go for dating with boys from school, that's why they are not allowed to go to school. – IDI-Class VI, Nashik, MH*

reported skipping schools during initial days of their periods or sometimes even all 5-6 days^{23 24 25 26 27}. Traditional beliefs also drive absenteeism for extended periods during menses especially during the menarche. Majority of the girls interviewed in Telangana²⁸ and a few in Rajasthan²⁹ reported having missed their school during the Menarche - the number of days ranged from 7-21 days³⁰. In Maharashtra and Gujarat, no such associated beliefs were reported. Girls also perceived that absence of a day or two does not make a big loss in terms of their studies, and even teachers support them to cope up with the lost studies. Many girls believed that “*despite such hindrances, girls cope up well*”. However, a few worried about the burden of catching up and falling behind in case the absenteeism extends seven days or more³¹.

Other commonly reported reasons across all states for absenteeism and dropping out were related to **household chores and economic work** such as care for siblings, household chores^{32 33}. In Maharashtra and Rajasthan, girls reported that they miss a few days of school in farming seasons to earn some extra

²³ “For the first two day periods, girls are not sent to school. After the second day period, girls come to school regularly even during their periods.”- IDI- Class X, Sangareddy, TS

²⁴ During menses, our teachers ask us not to come to school for 5-6 days. Girls too don’t come to school, this is how it is. They take bath on 5th day and after that they come to school”. IDI- Class IX- Raisen-MP

²⁵ “Although school is close to District HQ, still the belief people have about menstruation are varied. Parents believe that girls should not go out while having periods. But some of the girls come to school but mostly girls won’t come on those days. They stay back at home.” – KII-MEO-Female-Visakhapatnam, AP

²⁶ Girls usually do not miss school, but if they get it while in school, they go home taking leave from teachers. Next day she does attend school. She does not attend school on the first day of periods. It is difficult to come on the first day, can’t sit on ground for long at school. I don’t know about all girls but many of my friends miss school during periods, but that is purely because of discomfort, and there are no beliefs associated. Some even miss two to three days. girls do lose studies but they study at home to cope up with the loss. - IDI, Class VII, Ghasipura, Jaipur, RJ

²⁷ And sometimes when there is over flow of blood so I avoid coming to school and also need to change my cloth 2-3 times in a day, I cannot change it over here so I don’t come.- IDI- Class VIII, Raipur, CG

²⁸ “She had to stay at home for 15 days when she had her first period. She was not allowed to leave the house during that time. She was made to sit separately and was not allowed to interact with anyone”.- IDI-Class X, Sangareddy- TS

²⁹ In their area girls are asked not to go to school for two days when they attain menarche.- IDI, Class VII, Ghasipura, Jaipur, RJ

³⁰ “She had to stay at home for 15 days when she had her first period. She was not allowed to leave the house during that time. She was made to sit separately and was not allowed to interact with anyone”.- IDI-Class X, Sangareddy- TS

³¹ In a month, girls miss school 7-8 days of which 5-6 days are because of periods. We miss a lot of studies during those days. It is not possible to complete all the home work and studies that happen in school during those days. Teacher do ask us to do it, but since it happens every month. I think if girls could come during monthlies, they could attend school better.”- IDI-Class IX, Raisen, MP

³² Another reason for not attendance is household chores, parents go out for work leaving all household chores on girls.- KII, Female teacher, Nashik, MH

³³ Other kids take leave if they have to manage their household work, if they have to go with their parents for farming, sometimes they have to stay back home to take care of their younger brothers and sisters.- IDI, Class VIII, Mahasamund, CG

money for house, but also because they find it a fun activity to do with their friends^{34 35 36 37}. However, in Chhattisgarh, permanent drop-outs due to labour or work related migration were identified³⁸. A few also mentioned the need to avoid household chores is a reason they like attending a school^{39 40}.

A large number of girls reported that **compassionate female teachers** at school was the factor that made them attend the school regularly. The girls reported that they feel comfortable with the teachers and can get answers for questions that they are either hesitant or afraid of asking their mothers or other females in family. Teachers KII also suggested that a female teacher sometimes works as a bridge between girls and parents in discussing personal issues and health problems^{41 42 43}.

Other reasons were also identified during discussions but mainly as drivers for continuous enrolment in schools or drop-outs but less so as drivers of (temporary) absenteeism. Socialising related reasons were given by a few girls for why they liked attending the school. They frankly reported that school is the place where one can mingle with peers and buddies (even from the opposite sex) freely and without any fear of someone scolding them for wasting time and or instead of doing household work.

³⁴ One of the important reasons for missing school is when we have to work in our agricultural fields, during harvesting. Usually we miss around 10-15 days for harvesting. Sometimes we miss school when our mothers need to go to fields, then we need to stay back at home. At times mother ask us to miss school. We have been doing this since our childhood. – GD cum IDI-Class IX, Paldi, Jaipur, RJ

³⁵ Only during the farming days we go for doing works at the fields, for example weeding, softening of soil and seeding, plucking of vegetables etc. This we do mostly do in our own fields usually once in a year. So we need to miss school around 5-6 days in a year.- GD cum IDI- Class X, Paldi, Jaipur RJ

³⁶ Most of the children above 10 years go to the fields for petty works such as planting seeds, softening of soil around growing plants, removing weed, plucking fruits, harvesting etc. for which they get good remunerations (ideally Rs. 200/- per day). Although it is not very easy to work hours in those fields, they said it's fun since they go with friends. Girls go for such works more than boys.- IDI, Standard VII, Nashik, MH

³⁷ We don't miss school except for when we fall sick and when we need to go to agricultural fields. In a year I take around 12 chutti to go to agricultural fields, that is sometimes on Saturday when school opens for half day.- Usually planting paddy, onion, removing weeds and plucking ripe fruits such as tomatoes, cucumber are major things they do. We go to each other's fields, and also work for our own fields. Get around Rs. 200/- for working from morning 11 am. 5.30 p.m in other fields".- IDI, Standard VI, Nashik, MH

³⁸ There are girls who have dropped even out of upper primary school and they work as a maid in others house and parents are into alcoholism and they also force their kids to work for them. We have seen cases where girls who were very good in studies and they have left school in between because their father were alcoholic and later they work to support their mothers so they try to hide form us and also they feel embarrassed so they run when we go to call them.- KII, Female teacher, Mahasamund, CG

³⁹ In school it's a clean environment. At home we have to do household chores, here we can sit clean wearing good cloths. Sometimes only when teachers don't teach well or don't take classes, then it feels like not coming to school. But then our parents force us to come to the school, so we have to come. – IDI Class 9, Paldi, Rajasthan

⁴⁰ She likes coming to school to study. If she stays at home, she will have to do household chores or work in the farm, so she prefers to come to school.-IDI Class 10, Sangareddy, Telangana

⁴¹ "Our lady teacher freely discussed with the girls about the menstruation management. Janaki didi (name changed) personally contacted the girl student's mother and told her about menstruation problem. Then they all come to the school to get guidance".- KII, Headmaster, male, Jagatsinghpur, Odisha

⁴² Girls now have become much up-front about their problems, they speak up. A lot of girls now have told us their personal problems, so much now that we are planning to bring one lady doctor to address their problems.- KII, female teacher, Pune, Maharashtra

⁴³ They know we work for their good and we are their well-wishers, they talk to us very comfortably and openly. Earlier they would not talk to us or share anything about their personal problems.– KII-Female teacher-Jaipur-RJ

A few girls in Rajasthan also stated that school education will result in getting better (quality) groom as well as reduced dowry expectations. Some girls also identified incentives given at schools (e.g., bicycle and free uniforms) as a reason for attending. Poor access to school was also a barrier in a few cases⁴⁴⁴⁵. In two schools from interiors of MP and Rajasthan, poor quality of teachers and their failure to run schools in proper discipline prominently figured as the most important reason for absenteeism⁴⁶⁴⁷⁴⁸. Child marriage also came up as a reason in Rajasthan⁴⁹⁵⁰.

3.4.2 How WinS Facilities and Practices have Changed under SBSV/SBM

Researchers probed to find if and how respondents perceive that WASH facilities and practices in their schools have changed over the past three years since SBSV initiative was launched. Only a few girls, teachers and facilitators interviewed could relate to any change in maintenance or cleanliness in the recent and said that the schools were maintained similarly since several years⁵¹. In many schools from MP, Maharashtra and Odisha, teachers reported that most of the funds for construction of toilets were obtained under SSA several years ago⁵²⁵³⁵⁴. However, a few teachers also reported that SBSV/SBM

⁴⁴ *There are girls in our school who come from distant places-as far as seven kilometres away, other is unable to prepare food early in the morning and send us to school-sometimes without eating we come and it gets late to return- there is nothing in the vicinity for children to eat-the entire day we remain hungry- food at school is served to only the younger children and It takes an hour by foot to come to school, the roads are not safe. We return home by 7 in the evening- So how many days can we attend school like that?"- GD cum IDI-Class IX, Paldi, Jaipur, RJ*

⁴⁵ *"There are no secondary level school in our vicinity, so girls need to come this far (5 km on foot) to study if they want to continue studies. "Log eight class tak toh padha lete hai, lekin uske baad school pas na hone ke karan kuch ledkiyo ki padhai ruk jati hai" Some children go to private school who can afford, rest all come in this school. But in our knowledge all girls in our area have completed school till 12th standard."- GD cum IDI, Class IX, Paldi, Jaipur, RJ*

⁴⁶ *"A year back there were two good teachers in our school. So, there was more attendance from children. Everyone used to come to school. Since they left school, we don't find school interesting anymore. The current teachers are not at all good. They don't teach well. Two teachers out of five never come to school. I love studying, but since most of my friends have stopped coming now, even I too have stopped coming regularly, last one-and-a half months I had not been attending school. I am coming since last two days only."- IDI, Class VIII, Bhopal, MP*

⁴⁷ *The main problem we have in this school is that the teachers don't teach. Our exams are coming nearer but they don't finish off the syllabus. The English teacher don't take classes at all.- GD cum IDI-Class X, Paldi-Jaipur RJ*

⁴⁸ *Even the teachers don't teach well, boys are very mischievous here, keep shouting but the teachers don't do anything. Girls are ill-treated here but boys no matter what they do are never scolded.- GD cum IDI-Class IX, Paldi-Jaipur RJ*

⁴⁹ *A few girls are married off in early age. Usually it happens when a family is poor and they have two or more siblings to marry, they marry them together under one 'mandap' to save spending. Even boys are also gotten married like that. Some of such girls are allowed to study further, some not and drop out of school. In a few instances, the younger ones are sent to in-laws place at a later age. Sometimes they need to go there if need arise, in that case they miss school for days and lose interest in studies.' IDI-Class IX, Paldi, Jaipur, RJ*

⁵⁰ *Due to child marriage girls have dropped out. Recently girls in class VIII, nine girls got married and have dropped out of school.- KII, Female teacher, Jaipur, RJ*

⁵¹ *There is no specific scheme or activities reported with regards to WASH in the recent years, There is nothing noteworthy change in WASH in the last 3 years. It has been the same" – KII-MEO-Female- Visakhapatnam, AP*

⁵² *When I joined in the school, we brought funding from Sarva Sikhya Avijana and construct a toilet and urinal for the students.- KII, Head Master, Male, Jagatsinghpur, Odisha*

⁵³ *In my carrier of 13 years in comparison to earlier days I have seen children keeping better cleanliness than earlier. They fall sick less and now-a-days they attend school more. There has been a lot of awareness programmes in the recent years and the curriculum also have introduced too much of emphasis on cleanliness now. There are competitions so children are happy to come to school. I think this is the initiative of Maharashtra government and Sarva siksha abhiyan.- KII, Female teacher, Nashik, MH*

⁵⁴ *From 2005 onwards toilets with open roof has been started getting constructed in schools. That time money approved for construction of toilet was rs.20000. During the years 2015-2018, 6000 new toilets have been either constructed or repaired.-- KII, male, State-level officer- RJ*

programmes have contributed to further improvements in WASH infrastructure and involvement of different stakeholders in WinS^{55 56 57}.

Unlike lack of reports of substantial improvements in WASH infrastructure, qualitative research found several reports of improvements in WASH practices and behaviour of students in recent years in terms of hand washing, use of toilets or avoiding open defecation, and staying neat and clean^{58 59 60}. This was especially flagged for students those who don't have toilets in their own home and come from a community where open defecation is a practice. Few teachers and students reported that despite their wish to maintain cleanliness the funds from Government are not sufficient for buying soaps and toilet cleaning agents⁶¹; they instead depend on voluntary donors or school development fund for buying such products.

Researcher also found reports of improvements in MHM practices and provisions in the schools since SBSV initiative was launched. In Rajasthan, free sanitary napkins are provided to girls and in adequate quantities^{62 63 64}. Girls do not use unsafe absorbents and anymore and have become a change agent

⁵⁵ "The school always was clean and my father says toilets were there since the beginning, but every year they are repaired. Every teacher who comes to our school is enthusiastic to maintain cleanliness."- IDI, Class VI, Pune, MH.

⁵⁶ "I have heard about Swatch Bharat Mission in TV, but I have not seen any change in school due to that drive. The toilets for girls were renovated two years back, but they have been there since beginning. Drinking water also has been always good but in the last two years they have installed water filter and they also have started putting medicines in water. Before this filter also there was one but the new one is installed recently".- IDI, Class VII, Pune, MH.

⁵⁷ "Swatch Bharat Mission has not been the driving wheel for cleanliness in this school. We did not participate in Swatch Vidyalay Purashkar too, though I too have heard of it. Toilets were constructed under Sarva Siksha Abhiyan, grants are being received since 2001. But now Zilla Parishad has been also active in maintenance of cleanliness in schools and hygiene for girls".- KII, Female teacher, Pune, MH.

⁵⁸ There are so much of changes seen in children's health and washing habits. Earlier students don't use to wash their hands continuously and regularly and now they do. Parents also they were not able to tell them the scientific effects of it but now they are aware and they are washing their hands now.- KII, Female teacher, Mahasamund, CG

⁵⁹ "With the new WASH drive, now children have started remaining neat and clean, there is an overall change in the behaviour of the children. They know about hand-washing practices, food-eating habits and toilet behaviour".- KII, Female teacher, Ghasipura, Jaipur, RJ

⁶⁰ "Children do not go outside for defecation anymore, this has particularly improved in the last three to four years, When they go home too, use the toilet though their parents still prefer going outside. Sometimes children do not have bath in the weekend when they go home but come back and have hot water shower".- KII, Male teacher, Ashram School, Aravali, Gujarat

⁶¹ We buy hand-wash from little funds (962/- last year) we get from government which is not sufficient; sometimes also get dustbins, hand-wash, phynyle etc. from NGOs. We sometimes ask the children to bring soap from home. Parents too do provide, if we ask.- KII, Female teacher, Pune, MH

⁶² Before that we used to use cloth napkins, that used to spill, our uniforms used to get stained, skin used to get rashes and pain. We could never play, all the time used to confined to one place, sitting in one place, not even stand in class if teachers ask. All the time we used to feel uncomfortable and afraid that someone will see us bleeding. -GD com IDI- Class IX, Paldi, Jaipur, RJ

⁶³ "We give around four packets (6 pads in each pack) to girls which is much more than needed, they can use them during holidays or can share with mothers or sisters, its good for the health of the women, why not to distribute whatever we have if additional supply we are getting from the government". KII, Female teacher, Ghasipura, Jaipur, RJ

⁶⁴ Whenever we need napkins we can ask our teachers. We have been getting them since VIII standard, they give us additional packets, and we share with our sisters and mothers. – GD com IDI- Class IX, Paldi, Jaipur, RJ

for their mothers and sisters^{65 66}. In Odisha, hygiene education and promotion were reported by teachers⁶⁷. In Telangana, a personal hygiene and health kit is provided to all girls to introduce the concepts of cleanliness such as daily tooth brushing, taking bath, keeping hair clean and MHM. Various efforts to educate girls on WASH habits and menstruation were also made by people from NGOs and other institutions such as Medical colleges and government departments in MP, Rajasthan and Chhattisgarh^{68 69 70}. On the other hand, the researchers also found that several girls in Chhattisgarh still relied on the use of cloth-napkins not only because of local norms but also because of lack of provision and disposal facilities for (disposable) sanitary napkins^{71 72 73}.

Overall, qualitative inquiries find that the main contribution of SBSV or SBM in school settings is to increase utilization of WASH facilities, change behaviours and build support for WinS among students, teachers and educational officers, but the contribution for infrastructure is to improve their quality and functionality but not necessarily quantity.

3.4.3 Difference in WinS between High- and Low-SVP Rated Schools

⁶⁵ *The school gives us sanitary napkins for free, that is a good thing. I have been using sanitary napkins since the beginning of my periods and I never used cloths or any other material during periods.* - IDI, Class VIII, Ghasipura, Jaipur, RJ

⁶⁶ *We get sanitary napkins from school, around four packets in a month and there is no scarcity of pads in our school. It's in abundance; we give it to others at home. We have been getting it even before I got my periods, all girls from 7th onwards get pad for free, irrespective of whether they get periods or not, so every girl is aware of what is menstruation. We have never used commercial napkins and don't know if they are better than the ones we get from school.* - IDI, Class IX, Ghasipura, Jaipur, RJ

⁶⁷ *Schools play an important role in bringing about behavioural changes and promoting better health. Improved hygiene practices are essential. An efficiently and effectively implemented WinS programme will create healthier life, perform better in school and change their current hygiene behaviour. They also learn about menstrual hygiene and physical changes during puberty. They also learn how to avoid urinal infections.* - KII, Head Master, Male, Jagatsinghpur, Odisha

⁶⁸ *There were some outside people who came to our school and showed us the entire story on computer about a girl who had her periods for the first time; it was one year back this happened.* - IDI, Class VIII, Mahasamund, CG

⁶⁹ *There was lecturer from Indian college, and she came and told us many things about periods, washing method of our cloths and hand wash usage also. To teach about cleanliness there were few students from polytechnic college who came and told us about how to keep our surrounding clean.* IDI, Class VIII, Mahasamund, CG

⁷⁰ *Nurses from Government hospital come and speak to boys and girls separately on their topics on cleanliness and menstruation. Government hospitals have their schedule fixed for that. They come for hand wash education, sometimes for menstrual topic, sometimes for environment cleanliness.* - KII, Female teacher Mahasamund, CG

⁷¹ *Mostly girls come to school and they take half day leave and go back home if she gets heavy period so she is scared what if her dress gets spoiled and here there is no place to change their sanitary pad and even if she uses pads, she is scared about so many girls present in school and will take her wrong in front of them she cannot change also, the latrine does not have a sunlight or any light and water to manage and the urinal is all open any one can enter anytime and everything is visible from outside.* - IDI, Class VIII, Raipur, CG

⁷² *I have tried using pad once and we have to dispose it with by hiding it with everyone in we throw it where all the garbage is kept. Cloth is reusable and when it becomes very hard then we start using a new one, we just through it in the river or any lake or pond which comes on way. I don't use stayfree because I am not habitual and also I feel that it is getting dirty very soon again I have to change it; when and how I will change. I once thought that I will get pad and I will change it here but then we have a girl in school named Swati, everyone saw her throwing it, she did not even wash it and simply threw it, it is not good for dogs and cats they take it and byte it and also the person who will clean the premises for them also It is untidy. And she threw it because there is no dustbin and provision available for disposal.* - IDI-Class VIII, Raipur, CG

⁷³ *Like Dhanashri (name changed); she took leave yesterday because he dress was spoiled; she was constantly not coming since 3-4 days; She told me when her bottom got stained. Whenever anyone get periods in school so they take leave and go to their house because no support from school.* - IDI Class VII, Mahasamund, CG

To support the quantitative causal inference analysis, qualitative research also explored if WASH facilities and practices in high SVP rated schools differ from those in the low SWP rated schools and how this difference can relate to different educational outcomes in these schools. In general, the sanitation facilities were inadequate in low-rated SVP schools in MP, Rajasthan and Chhattisgarh⁷⁴ ⁷⁵. One third of the girls from low SVP rated schools reported that the toilets are not functional or accessible throughout the year. Girls also reported of not drinking enough water at school to avoid going to dirty toilets⁷⁷ ⁷⁸. Cleanliness of toilets was a major maintenance issue in MP, Chhattisgarh⁷⁹ and Rajasthan⁸⁰ in low SVP rated school. However, a few girls in high rated SVP schools also reported that the toilets in their school do not remain clean and are whitewashed only during inspection or when some officials come from outside⁸¹ ⁸². The provision of MHM services was somewhat better in high SVP rated schools in terms of MHM counselling, availability of napkins and place to change

⁷⁴ They are scared in going to the urinal toilet because it is all open and also there is no shed and gate, every time we go we think what if someone will come; there is a highway near by; people cross every time and that is why we go in a group so that we take turn to stand while one of our friend is inside.- IDI-Class VIII, Raipur, CG

⁷⁵ Toilets in the school are never cleaned, remain soiled and dirty, yet we go there. We have to go to the dirty toilets only. When those are too dirty, we go outside. Sometimes, the seats are soiled so we go over that only. They have been cleaned perhaps in a day or two because they go to know about visitors coming to school. In case of emergency we go out and after coming back we wash hands in school.- GD cum IDI, Class X, Paldi, Jaipur, RJ

⁷⁶ During the one-to-one discussion respondent revealed a different picture of the school. She said the school remains very dirty usually; even the toilets don't remain clean, they stink. Nobody go inside the toilets, only a few old girls go to the toilets as they are helpless. Even the school compound remains very dirty. She told several times during the interview that the toilets remain very very dirty and stinky and nobody go inside the toilets.- IDI, Class X, Paldi, Jaipur, Rajasthan

⁷⁷ "Jab pani hi nehi pite to toilet keise ayegi", (when we don't drink water, how will we feel urge to go?) We avoid drinking too much of water at school. -IDI-Class X-Raisen, MP

⁷⁸ "She feels that they might fall sick because they don't go to toilets, they may have stomach ache."- IDI, Class IX- Raisen, MP

⁷⁹ The one for urinal purpose was completely open, without any shed and gate to it, with not even 5% safety/privacy to it, there was a soap which was kept near it for hand wash and a tap. From the same tap children drink water and also wash their hands. And the other one which had a western seat in the toilet was used for latrine and was not well maintained, very untidy with some buckets filled inside with dirty water as well as the seat was not clean. Inside also there was a soap kept, for urinal they have to carry water inside in a bucket there isn't any tap available. Apart from the main latrine there are other two latrines but they have stopped using it and ultimately it has turned into a store room.— Observation data, Raipur, CG

⁸⁰ It's only when someone come for inspection, they make it (toilets) clean, on the day of visit of the survey team too (she referred to the survey team of WinS-study), they cleaned it and kept soaps there. They ask some boys to clean the toilets and the toilet pits. She said teacher advised them say good things about school if someone come from outside.- IDI, Class X, Paldi, Jaipur, RJ

⁸¹ Few students took the liquid to wash their hands, and the liquid was kept in the office. At the time of lunch, they keep it near the tap. The pack was opened on the same day when our visit was made. – Observation data, Raipur CG.

⁸² When observed, there was no bottle of hand wash soap was found near the toilet. Later, the teacher said that whoever needs to wash their hands can take the bottle from the office. The Dettol hand wash bottle had soapy water not the proper liquid soap even though the school said to have received the stock for all 12 month - Observation data, Mahasamund CG.

napkins, but almost all girls from high SVP rated schools also reported that they do not change napkins at school and even if there were adequate provisions^{83 84 85}.

Overall, the difference in WinS between the low- and high-SVP rated schools was mainly in terms of WASH practices of students and quality (maintenance and functionality) of WASH infrastructure. However, even low SVP rated schools had enough WASH facilities to provide drinking water, use toilets if there was a need and wash hands after the use. Most girls interviewed rarely used the school toilets and urinals so their low quality in low SVP rated schools was not considered a barrier as discussed more in the next section.

3.4.4 Importance of WinS for Enrolment, Absenteeism and Learning Outcomes

Researchers specifically probed if and how WASH was related to the attendance of students or their enrolment because WASH related reasons were not forthcoming on their own during the free-flowing discussions^{86 87 88}. When specifically probed, we could identify WASH as a convenience factor rather than as a necessity for attendance^{89 90 91}. Girls also stated that they like to come to school because of the cleanliness maintained and toilets in school compound⁹². While the girls agreed to having access to better WASH facilities in schools than their homes or WinS level being better than those a few years

⁸³ *There are girls who are very shy in going for latrine, or to change their pads. No one is comfortable in going for latrine or for changing of cloth or pads at the times when they are in period.- IDI, Class VIII, Mahasamund, CG*

⁸⁴ *Whenever any girl wants to change a pad during periods, she prefers going to their house in middle of the school rather than changing over here.- IDI, Class VIII, Mahasamund, CG*

⁸⁵ *In school we hesitate to go for latrine because my friends tease me; doesn't your house got a toilet? And we think that what other classmates of mine will say if I go for latrine. "Koi Kuch bol na de" "kaisi hai yeh ladki apne ghar se nahi karke aati hai kya. I never changed pads in school, usually change after I go back to my house." - IDI, Class VII Mahasamund, CG*

⁸⁶ *"Betterment of toilets has no effect on girls' enrolment or attendance toilets in school were already been available for these girls. But yes, cleaning the toilet was problematic which is now been taken care by harijan. Otherwise due to facilities related to WaSH, no effect on girls attendance or enrolment has been seen."- KII, Female Teacher, Jaipur, RJ*

⁸⁷ *I don't think dirty toilet is the only reason why children don't come to school, we come to study in school and teachers should teach well. This month I already have skipped school three days. There were works at home, but then if no studies happen in the school our families also don't get interested in educating us- IDI- Class X, Paldi, Jaipur, RJ*

⁸⁸ *The overall effect of improvement in girl's attendance and retention is because of the overall social reform that has happened due to various schemes and efforts of several organization and govt. departments. Child marriages are becoming less. An educated girl is now preferred without "Dowry", even parent's wealth is not as significant as education of girl is. There is no marriage of girls at young age as the rules have become very strict- Anganwadi workers, members of Panchayat, Patwary, Secretary, BDO, SDMO, everyone has been made responsible to ensure that no child marriage takes place in their area. So girls who are highly educated, even if not working are accepted by-enlarge by groom's family.- KII- School Principal, Ghasipura, Jaipur, RJ*

⁸⁹ *"Improved WASH has effect on hygiene but not an attendance. The effect is more on the comfort of the girl students".- KII, Male teacher, Aravali, Gujarat*

⁹⁰ *"Drop outs have decreased drastically owing to MDM and improved school environment and facilities offered at schools. Well-to-do parents go for private schools and others fall back on Govt schools." - KII-MEO, Visakhapatnam, AP*

⁹¹ *"Now girls who don't attend schools are mostly due to social reasons or the drop out after class 10 or if they fail in class 9. With improved wash facilities in most of the schools attendance is no more related to WASH practices". CRC- Aravali, Gujarat*

⁹² *She thinks having the new toilets constructed three years back has benefitted them a lot. Earlier when they did not have toilets in school, the children who are from nearby places used to go home to attend natural call, the ones from far away used to go in the open; they had no option. For older girls it used to be even difficult, they go to nearby friend's places if possible. Now it has become more comfortable for them; now children study better in class. - IDI- Class VII, Ghasipura, Jaipur, RJ*

ago, they could not usually give examples of how WASH reduced absenteeism or increased enrolment except in Maharashtra. The girls in Nashik felt that water access was much better in their school than at their home and this motivated them to attend the school regularly^{93 94}. WASH education and MHM counselling are also being perceived as important life skills a girl must have⁹⁵. WASH education and counselling was perceived to be developing a connection between teachers and students. With better WinS facilities, even the teachers felt that they are able to reduce absenteeism during menstruation⁹⁶.

Researchers also probed for any perceived associations between WASH and learning outcomes. None of the students, teachers and administrators could provide examples of how or could cite any case where learning outcomes could be associated with improved WASH. However, when researchers probed by asking ‘why should we invest in WinS if it doesn’t help with attendance or better learning outcomes’, most respondents linked WASH with comfort and convenience which can improve the experience at schools and in turn improve learning outcomes^{97 98}. A few students and teachers also attributed WASH to improved health and attendance ^{99 100}.

⁹³ “At home we need to haul water from a distance of half a kilometre. We need to manage with less water for bathing, washing cloths and toilet. In school water is readily available; they can use toilets without any problem. Toilets at home stink, here in school they don’t as there is enough water to flush”. There is no issue of drinking water too. During winters, when we don’t have water at home, we drink water from school only”. - GD cum-IDI, Stan VII, Nashik, MH

⁹⁴ Availability of water is better in school than home. At home we carry water from a well that is outside the village. There is shortage of water for drinking, washing and bathing.- IDI, Class VI, Nashik, MH

⁹⁵ Coming to school will benefit me a lot in long term, as she is regularly taught about the diseases, hygienic care, and health problems which they face in life and in future also they will know how they have to manage everything and precautions they have to take.- IDI-Class VIII, Mahasamund, CG

⁹⁶ There is behavioural change as well. They know we work for their good and we are their well-wishers, they talk to us very comfortably and openly. Earlier they would not talk to us or share anything about their personal problems. They used to go home making some excuse during periods, we also used to send them; what to do, we had no facility here. Now that has reduced, taking leaves from school in the middle of a day has become less.- KII, Female teacher, Ghasipura, Jaipur, RJ

⁹⁷ “There is less absenteeism among girls since the new toilets have been built.”-IDI, Class X, Sangareddy, TS

⁹⁸ Swatchta ke moohim ke wajah se ledkiyo ki results mein toh koi khas frk nehi hai, par abb ledkiyo ka maan laga rehta hai school mein. Unhe ghar nehi jana padta, abb school mein hi pad change kar sakte hai. Aisa huwa kyuiki hum pad bhi free mein dete hai. ” – KII, Female teacher, Ghasipura, Jaipur, RJ

⁹⁹ “If toilet facilities are poor, girls may avoid using them. This can lead to health problems like stomach pain. Students may be prone to diseases and may end up having problems in the future.”- IDI, Class VIII, Sangareddy-TS

¹⁰⁰ In my carrier of 13 years in comparison to earlier days I have seen children keeping better cleanliness than earlier. They fall sick less and now-a-days they attend school more. There has been a lot of awareness programmes in the recent years and the curriculum also have introduced too much of emphasis on cleanliness now.- KII, Felame teacher, Nashik, MH

4. CONCLUSION AND RECOMMENDATIONS

4.1 Summary of Findings

The primary research question this study answered is whether better levels of WASH facilities and practices achieved under the context of SBSV reduce school absenteeism of girl students. The high rating of schools under the SVP is used as a proxy for overall WinS levels. The secondary questions this study addressed are related to the effect of WinS on enrolment and learning outcomes using primary and secondary data analyses as well as exploring other enablers and barriers to attendance. Below, we summarize the main findings related to above research questions.

Is SVP a good proxy for WinS level?

We compared a matched group of low- and high-rated SVP schools for multiple indicators related to WASH facilities in the school, their utilization by girl students and WASH practices of girl students. We find statistically significant and consistent results which prove that high-SVP rating is associated with independently assessed and verified overall WinS status by our survey team. The qualitative findings from IDIs and KIIs also support these findings. Therefore, SVP rating was indeed a valid proxy for better WinS level as anticipated in the RFP and original study design by UNICEF.

Yet, a large number of high-SVP rated schools still have poor levels of handwashing and waste management infrastructure and practices. The gap in the SVP score and objective verification by our enumerators suggests that there is still a big room to improve SVP rating process to find and reward exemplary performers. Qualitative research also found that though high SVP rated schools are indeed better in terms of quality of WASH facilities and practices by girl students, access to toilets and urinal is not always regular and the cleanliness is sometimes an issue. Lack of funds for handwashing soap or cleaning agents are also stated as impediments in high SVP rated schools. The SVP competition collects self-reported data on multiple WASH components from the schools, but a few principals were not even aware that their school had applied for the SVP award; and several reported that their applications were filed by the block or cluster resource centre. Most teachers from even high-SVP rated schools could not recall any audit or assessment by the state or district authorities before their SVP rating was determined. These findings are neither new nor surprising. Our past two years of work with UNICEF to verify and validate national SVP ratings of candidate schools across India had also identified similar issues and resulted in recommendations to MHRD to revise the assessment questionnaire and strengthen the verification process.

Is better WinS or high SVP rating associated with better educational outcomes?

We find no clear evidence that better WinS – captured through high SVP rating as the proxy indicator – resulted in reducing absenteeism. We could not find statistical evidence that better WinS under SVP is associated with reduced dropout and retention, increased enrolment or transition to the next grade or higher learning outcomes. To avoid finding spurious associations, all statistical models controlled for the confounders which could in fact be driving the attendance but could also be correlated with WinS levels. Therefore, overall implication of the findings is that WASH is not as strong a driver of educational outcomes as some of the other non-WASH drivers measured (and controlled for in the analysis) or unmeasured (and not controlled for in the analysis).

The qualitative research also could not find consistent evidence that WASH can reduce absenteeism or school dropout or improve learning outcomes. Even after repeated prompting of respondents in IDIs, we could not get any compelling narrative that improvements under SBSV or SVP improved educational outcomes except in a few cases in Maharashtra where girls reported that they attended schools because the school had better WASH facilities than their homes. The KIIs found that under SSA most schools had solved the problem of availability of and access to WASH facilities to a great extent – even in the low SVP rated school – whereas SBSV mainly contributed to better quality and maintenance of WASH infrastructure as well as better WASH practices by students. Perhaps this is the reason WinS related factors were not identified as barriers. Another related reason could be that the high SVP rated schools actually didn't deliver all WASH components to a level of functionality and convenience anticipated under the SVP guidelines, and perhaps, much higher levels of WinS are needed before WinS can contribute in a measurable way to improve enrolment, attendance or learning outcomes.

Which other factors can affect school attendance?

Qualitative research identified three important factors that drive or impede girls' attendance: (1) availability of female teachers; (2) harassment-free school environment and commute for girls; and (3) changing community norms around school attendance during menstruation and use of children for economic activities. Preference to female teachers is mainly to have a guidance-support system for girls to deal with even non-academic issues and to assure parents of a capable female stewardship in schools. Even teasing and harassment from boys at school and during commute to school basically reinforces parents' belief that it is not safe for girls who come of age to attend school. While MHM counselling and provisions in schools help to some extent especially in management of menses, social norms and customs drive attendance decisions. Similarly, girls missed schools for multiple days to support in household chores, farming, or other economic activities including working for income for some other families. Whether missing school days during menses or missing them due to work are deep rooted social and cultural norms which only a WinS programme may not address, and a multi-pronged strategy may be required (which we believe is already a case).

4.2 Strengths and Limitations of the Study

The study strengths include a counterfactual design and analysis which would control for several biases which often result on spurious correlation. We also rely on a large sample of girls and schools from 44 districts across eight states which had adequate statistical power to detect even small effect size. We also triangulated the insights from primary data analysis, qualitative research and ecological scale analysis of secondary data from U-DISE and NAS and the findings are consistent irrespective of methods and data sources used. However, a cross-sectional study such as ours suffers from several theoretical limitations in proving causality as discussed in Section 2.1. Additionally, this study faced two critical limitations which may have contributed to finding no effect of WinS on educational outcomes.

First, the study design and sampling could have excluded girls who are more prone to absenteeism and thus undermined the true effect of WASH on absenteeism of such girls. The sampling was school-based, and thus, excluded girls who would have already dropped out during the academic year or absent on the day of the survey. We dealt with this limitation by not only presenting results for the

sampled girls but also for all enrolled girls by relying on their attendance records from the school rosters. Still, we cannot rule out a possibility that the sample in low SVP rated schools excluded a higher proportion of girls who were absent, and thereby, undermined the effect of WinS on absenteeism.

Second, our study is restricted to schools which participated in the SVP competition so that the findings are not generalizable to schools which didn't participate in the SVP. Even the low-SVP rated schools had basic drinking water, toilets for students and some handwashing provision at a level which give them confidence to compete and perhaps these WinS levels were high enough to have addressed any absenteeism due to poor WASH in the past. While almost one third of the schools in India participated in the SVP competition, two-thirds didn't and perhaps this cohort includes many schools with poor levels of WinS which might be leading to higher absenteeism among girls. We attempted to address this limitation by analysing secondary U-DISE and NAS data, but we had to rely on district-level data analysis which suffers from biases of ecological scale analysis.

Literature review in Section 1.1 identified that evidence of adequate scientific and statistical rigor to causally link WinS with educational outcomes is very limited. If answering this causal question is of utmost policy importance, then perhaps UNICEF can consider commissioning studies with more robust designs considering at least the following features: (a) taking a representative sample of general population of girls without restricting the sample to only school-going girls or those who attend the schools; (b) surveying all schools and not only the SVP participants; and (c) considering secondary analysis with school-level U-DISE and NAS data which is currently not available publicly. Studies with above features will certainly require many more months and resources than those that were available for the current study. Unfortunately, even a study with above features commissioned with required time and budget will continue to face theoretical limitations of proving causation which only a cRCT or robust quasi-experimental designs can address. UNICEF can evaluate the cost-benefits of commissioning costly and time-consuming cRCTs to validate the theory that WinS will indeed decrease absenteeism and increase learning levels.

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APPENDIX A: STATISTICAL RESULTS TABLES

Appendix Table 1. Sample Summary at District Level.

State	District	Number of Schools			Number of Girls		
		Low-SVP	Hi-SVP	All	Low-SVP	Hi-SVP	All
Andhra Pradesh	Anantapur	11	10	21	146	119	265
	East Godavari	9	8	17	104	102	206
	Kurnool	12	12	24	184	158	342
	Prakasam	9	8	17	126	83	209
	Visakhapatnam	13	14	27	202	156	358
	Vizianagaram	14	14	28	159	182	341
Chhattisgarh	Gariaband	12	11	23	141	120	261
	Janjgir - Champa	12	12	24	120	111	231
	Jashpur	12	12	24	139	120	259
	Korba	11	11	22	120	105	225
	Mahasamund	12	12	24	140	143	283
	Raigarh	12	12	24	133	131	264
Gujarat	Aravalli	9	9	18	74	91	165
	Banas Kantha	12	12	24	143	136	279
	Chhotaudepur	9	9	18	94	100	194
	Kachchh	13	12	25	130	98	228
	Sabar Kantha	12	12	24	121	115	236
	Surendranagar	12	12	24	131	120	251
Madhya Pradesh	Chhindwara	12	12	24	130	119	249
	Khargone	12	12	24	118	121	239
	Morena	12	12	24	98	129	227
	Narsimhapur	9	9	18	96	97	193
	Shahdol	12	11	23	127	124	251
	Ujjain	13	13	26	130	143	273
Maharashtra	Kolhapur	13	13	26	118	121	239
	Nashik	12	12	24	109	110	219
	Pune	12	12	24	103	129	232
	Satara	9	8	17	103	113	216
	Solapur	12	12	24	124	136	260
Odisha	Bhadrak	12	12	24	143	139	282
	Ganjam	12	12	24	142	123	265
	Jagatsinghpur	12	12	24	105	116	221
	Keonjhar	12	12	24	120	115	235
	Nuapada	12	12	24	136	121	257
	Sundergarh	12	12	24	103	122	225
Rajasthan	Barmer	12	12	24	124	133	257
	Chittaurgarh	11	12	23	123	153	276
	Jaipur	12	12	24	126	127	253
	Jodhpur	9	10	19	127	111	238
	Pali	12	12	24	141	130	271
	Sikar	12	12	24	136	150	286
Telangana	Adilabad	12	12	24	152	143	295
	Nirmal	12	11	23	123	102	225
	Sangareddy	12	12	24	144	102	246
Total	44	510	505	1015	5608	5419	11027

Appendix Table 2. Balance of Potential Confounders and Covariates between High and Low SVP-rated Schools

	Low SVP Rating	High SVP Rating	Adjusted Group difference (H-L)	
	L	H	Difference	p-value
School Characteristics				
N for Schools	505	510		
% of Govt Schools	91%	94%	2%	0.089
% of Schools with primary level	45%	47%	2%	0.252
% of Schools with upper primary level	89%	91%	2%	0.179
% of Schools with secondary level	40%	37%	-2%	0.423
% of Schools with higher secondary level	10%	8%	-2%	0.276
% of Girls-only schools	6%	9%	3%	0.013
% of Schools with hostels or residential facilities	4%	12%	8%	0.000
Mean number of girl students in the school	88	95	6	0.134
Mean number of total students in the school	169	174	6	0.405
Mean of additive index of school facilities (0-32)	7.1	8.5	1.3	0.000
% of Schools where MDM was served on all days in the past month	74%	76%	2%	0.337
% of Schools with MDM includes dairy, fruits or eggs	31%	35%	5%	0.022
Socioeconomics and demographics of girl students				
N for Girl Students	5419	5419		
Mean household size	6.3	6.1	-0.1	0.008
Mean number of rooms	3.6	3.6	0.1	0.249
Mean number of consumer durable assets (0-5)	2.7	2.9	0.2	0.000
% of girls where all household members use their IHHL	58%	65%	8%	0.000
% of girls whose father works as a cultivator	38%	38%	-1%	0.520
% of girls whose father works as a labourer	32%	31%	-2%	0.056
% of girls whose father works in a business/shop	14%	15%	1%	0.043
% of girls whose father has a job	9%	10%	1%	0.030
% of girls whose fathers don't work	1%	1%	0%	0.021
% of girls whose mothers don't work	50%	48%	-1%	0.158
% of girls who have started menstruating	43%	42%	-1%	0.115
Access to School				
% of girls who stay in a hostel	5%	14%	9%	0.000
% of girls who walk to school	83%	81%	-2%	0.008
Mean time taken to travel one-way to the school (minutes)	16.4	14.8	-1.3	0.000
% if girls who find travel to school easy and safe	78%	72%	-7%	0.000
Enabling Environment				
% of girls whose parents actively support her education	99%	100%	0%	0.004
% of girls who believe that all her teachers actively support her education	80%	82%	2%	0.007
% of girls who are member of any student / adolescent group	33%	40%	8%	0.000
% of girls who regularly eat MDM in the school	76%	82%	5%	0.000

Appendix Table 3. Effect of High SVP Rating on Passing % and Absenteeism as per School Records.

	Low SVP Rating (C)		High SVP Rating (T)		Adjusted Group difference (T-C)	
	N	%	N	%	%	p-value
% of Girls who passed to the next grade last year						
Grade 6	432	99%	456	99%	0%	0.588
Grade 7	430	99%	455	99%	0%	0.810
Grade 8	390	99%	397	99%	0%	0.572
Grade 9	196	93%	189	92%	2%	0.277
Grade 10	194	86%	181	87%	-3%	0.253
% of person-days the girls in the sampled class lost to absenteeism in the last calendar month						
Grade 6	433	17%	453	14%	-2%	0.085
Grade 7	428	17%	452	15%	-1%	0.204
Grade 8	386	18%	398	16%	-1%	0.280
Grade 9	197	18%	189	17%	-1%	0.423
Grade 10	193	14%	183	13%	-4%	0.022
% of girls in the sampled class who were absent for 6 or more days in the last calendar month						
Grade 6	433	23%	453	19%	-3%	0.106
Grade 7	428	24%	452	20%	-3%	0.106
Grade 8	386	25%	398	20%	-3%	0.086
Grade 9	197	23%	189	22%	-2%	0.587
Grade 10	193	17%	183	16%	-4%	0.089

Appendix Table 4. Balance of Covariates between High and Low Coverage Districts using U-DISE Data

	WASH Coverage [#]		Adjusted Group difference (T-C)	
	Low	High	Change	p-value
N	326	336		
Total number of Government and Private schools	1936	2433	375	0.000
Number of blocks	12	10	1	0.195
Number of villages	804	985	118	0.019
Number of clusters	118	135	9	0.169
Average number of instructional days in upper primary	222	226	0	0.584
% of schools in rural areas	84%	82%	-3%	0.059
% of government schools in rural area	86%	78%	-3%	0.008
% of schools with upper primary or higher levels	43%	46%	2%	0.025
% of schools connected with an all-weather road	85%	92%	3%	0.002
% of schools with classrooms in a good condition	76%	83%	2%	0.019
% of schools with electricity	45%	63%	4%	0.003
% of schools with computers	24%	31%	2%	0.014
% of schools with a School Management Committee	76%	68%	-4%	0.006
% of schools which received school development grant	49%	52%	3%	0.010
% of schools which serve Mid-Day-Meal	73%	68%	-3%	0.017
% of schools with 50 or fewer students	36%	30%	-2%	0.061
% of upper-primary schools with Pupil-Teacher Ratio >= 35	12%	15%	1%	0.368

[#] High coverage is >= 90% of schools with upper-primary and higher grades have both girls' toilets and drinking water

APPENDIX B: QUALITATIVE CASE STUDIES

Case Study # 1

High SVP Rated School

KII: Teacher Kalyani (Age-51 years)- Female teacher, ZP Primary School- Pune, Maharashtra

Teacher Kalyani (name changed) is a senior staff in a Zillah Parishad Prathamik School in Pune district. She is fifty one year-old and has a work experience of 23 years and has been working in the school under study since last five years as a teacher for Upper Primary sections as well as an acting principal. All girls in the school took her name as the key person who supports them during their difficult days.

Children in the school come from a single village near a large dam - as per the school teacher the community is prosperous - mostly engaged with agriculture. With good amount of water available from the dam, yields are good, and parents don't have any financial problem supporting their children for better education. Daughter from the community have achieved well educationally and secured jobs outside while they prefer to keep sons with them in the village to support farming.

The school was rated as a High in SVP assessment and upon observation demonstrated a well-maintained school compound and good WASH practices for most of the WinS components in place. The school had 24-hours running water, well-designated hand-washing and drinking water stations (connected to water purifier) and well-constructed toilets separately for boys and girls-separate latrine and urine units, running water/soap/cleaning agents inside toilets. However, there were not much of facilities for Maintenance of Menstrual Hygiene and disposal of sanitary napkins at school.

“Earlier I used to teach in a different school. Comparatively I find girls in this school very smart, even more than the boys. Boys are not serious about studies. Overall this village itself is aware of need of better education for girls. In fact, girls in this village are preferred more for education than boys. These changes have taken place over decades, even their mothers are educated with most of the mothers educated to 12th standard. Though they are agriculturists, they are (both men and women in the village) all well-educated.

There is no specific reason why girls don't come to school. On an average around 5-6 children remain absent from the school, sometimes due to diseases or any other reason. There are fewer boys than girls in the school. They don't mind sending girls outside of village for higher studies, some have become engineers, doctors, MBAs, some did BSc and MSc, some dream to do MPSC, IAS. But the villagers don't send the boys outside for studies. Boys are dear to them, so they are scared to send boys outside. They feel boys are well secured at home and can do agriculture later on.

One or two girls drop out of school after standard X and some after standard XII. But all girls do schooling till standard X. If any child misses the school, their parents are supposed to tell me the reason, else I don't spare them. We need to keep attendance at 100%. It is a mandate for us also to bring all children to school till age 14. Even if some girl stops coming due to adverse situations, we go and counsel them,

so parents do send them to school. There is no incidence of eve-teasing, molestation but any we take care internally of any rare incidences and we do take care that children don't do anything immature.

The main reason for some girls not to continue higher education is marriage. Sometimes it's financial condition of the families as higher studies need more money.

Every year we get some or the other refreshers training at block level. We get training on hand-washing and other cleanliness activities. We buy hand-wash from little funds (962/- last year) we get from government; sometimes also get dustbins, hand-wash, phenyl etc. from NGOs. We sometimes ask the children to bring soap from home. Parents too do provide, if we ask.

We dispose school trash, burn them every day. Liquid and faecal wastes go to septic tank and sewage pits. But there is no provision for disposing sanitary napkins here, so girls don't change napkins in school. They burn them at home, as local belief does not allow them to throw used pad in open. There is no provision of incinerator nor have I (teacher) ever heard of it.

Toilets are cleaned by the children themselves; everyday one class does the cleaning. They use phenyl. There are adequate numbers of toilets equally and separately for both boys and girls. No child goes outside of school for attending natural calls. It is the girls of standard VIII onwards who get "Masikpali (menstruation)" who hesitate to use the toilets during menses.

Cleanliness is a daily practice, every day during assembly we take care of it. One day in a week we check their nails and hairs. Girls are taught how to remain clean, especially during menses, we tell them how to clean private parts.

Swatch Bharat Mission has not been the driving wheel for cleanliness in this school. Toilets were constructed under Sarva Siksha Abhiyan, grants are being received since 2001. Zillah Parishad has been also active in maintenance of cleanliness in schools and hygiene for girls. Earlier in the village, people used to go in the open lands for defecation, now that has become less.

Recent cleanliness drive is a not a reason for better attendance or retention, but because of cleanliness, children remain smart and healthy."

I have received training form Maharashtra government on hygiene of girls titled (Smart girls - to be happy and to be strong- menstruation and hygiene); she showed a book and also says she was provided a CD from Pune Zillah parishad. This training is about girl's hygiene, how they should keep clean and specially during menstruation. I teach these to the girls of all classes to the girls of nearby high school too as there is no female teacher there. Though a male teacher in the high school is given the same training, he can't teach the girls due to hesitations so ask me only to take the classes. I make small girls' groups and through play and storytelling I tell them about the future dangers to their health if they don't maintain hygiene. We take this class as and when directives from higher authorities come. Last years I took three such classes. This year, one class so far. Girls now have become much up-front about their problems, they speak up. A lot of girls now have told us their personal problems, so much now that we are planning to bring one lady doctor to address their problems.

Girls in this village also have become so smart that they don't even let anyone know that they are menstruating. During menstruation parents also don't hesitated to send their daughters to school. Only in case if they have physical discomfort like stomach cramp, they are advised to stay at home.

Diseases in the village occur less, and there have been only few incidences of communicable diseases. Health care facilities here are also adequate. All vaccines are provided to children, girls are given iron-folic acid tablets every week. ANM and Anganwadi workers do come sometimes. The girls are given 'Smart cards', that is supposed to give them sanitary napkin packs for Rs. 5/-. A girl pays Rs. 25 for a pad to 'Self-help groups' and government returns Rs. 20/- for each pack through this card. But girls don't do this, as such napkins are not available now a days. I did procure some packs of napkins from the SHGs this year to give the girls if sudden need arises, last year I had to buy from my own pocket. If I don't have napkins with me, I ask them to go to some lady who stocks marketed napkins. There is no Medical store where they can buy pad nearby.

We need more funds for maintenance of the school building, repairing the toilets, as they are quite old now. Otherwise, facilities are good at the school.

We don't take separate sex education classes for boys. I feel they should be thought about what girls go through during puberty. Male teachers should take boys classes. Then even they will know girls' problems better.

Case Study # 2

High SVP Rated School

IDI: Mona (Age-13 years) - Standard VIII–GOVT SEN.SEC.SCH– Jaipur-Rajasthan

Mona (name changed) studies in a school in the Shahpura block of Jaipur district, around 90 kilometres away from the capital city. The school earlier was situated near the Jaipur-Delhi highway, expansion of which compelled the authorities to shift the school from its original place to inside of a village which now is far for the children who are studying from the nearby areas of the old place. The school building is new, so are the toilets, all facilities of WinS seemed appropriately in place, school seemed progressive and toilets were constructed separately for girls and teachers. For boys only urinals are available while for latrine boys need to go out in open or go home.

Mona who lives in a family of seven, two brothers, one sister and her grandparents living with her, says she like to come to school because she like to study, she is fond of Hindi and thinks all teachers in her school teach well. She comes to school because her parents ask her to pursue education.

There is provision of water in school, both for drinking and for sanitation. They do wash their hands with soap before taking mid-day meal. Teachers have taught them and also inspect if they are always washing hands. There is soap kept in toilets also. There are two latrines and two urinals made in this school a year back. Before that there was only one set of toilets which were used only girls. There is provision of water in both. They use the latrines mostly for both urine and defecation purpose as they find it more comfortable. Urinals are used too, and they fitted with flush and are clean. There are separate toilets for boys and girls. All girls young or old use the toilets.

They used to live in Pritapura (name changed) earlier, but a lot of families together moved to this new place because it was getting crowded there. There was no place there to even go to defecate. In the new place there is a lot of open place to make toilets, but even now everyone goes for open defecation. It's only that the new place has enough space to go out. She finds it difficult to differentiate between defecating in open while at home and having a toilet in school and says both the place are equally comfortable. She says they all freshen up (use toilets) before coming to school even though they need to go in the open to defecate. This is how it is done always and there is usually no need to go to school toilet for defecation in a usual day. But whenever they need to, the school facility is little more comfortable as they don't need to go in the open and there is water inside. We go with friends to toilets in school. I come to school with my sister and cousins.

Mona feels if toilets were not available in school, they will be in trouble. But she thinks even without toilets too girls will come to school. They will need to go to open for toilet but that will not be deterring factor for remaining away from school for children. Even in the earlier school building (this is a new school building which has shifted because the earlier school was shifted due to construction of the highway) had no toilet, yet children used to go to school. She thinks older girls don't go to open for toilet, but she is not aware where they go.

Our teachers teach us about cleanliness, how to use sanitary napkins. They have asked us to wrap used napkins in paper and through it in the dustbin kept in the toilet. But I have never changed pad at school. I do not know if anyone throws them in the school. I think it is burned off by teachers if anyone throws

pads there. There is no specific place for burning off sanitary napkins and she hasn't seen any incinerator ever. She throws off her used pads at home, burn off in open away from home compound.

There is no specific class taken for teaching cleanliness. Those lessons are usually taken casually by the female teachers, but male teachers also teach about cleanliness. Teaching on menstruation-related topics was taken separately for all girls by female teachers. Such classes are taken around 2-3 times in a year and girls from VII standard onwards are made to sit for these classes. Every month in a specific session the boys go out and girls are distributed napkins, there is no specific teacher for that and any of the three teachers take such sessions. She does not remember what was taught in those classes except for telling them how to dispose pads. Usually we get around four packets of napkins with six pads in each. This is more than what they need, and they sometimes share with their mothers or sisters. *"The school gives us sanitary napkins for free, that is a good thing. I have been using sanitary napkins since the beginning of my periods and I never used cloths or any other material during periods."*

Mona can't tell any specific reason why children largely miss school. But on an average boys bunk school more than girls. Even today all girls are present but not all the boys. But they don't tell why they don't come to school. But nobody bunks school for long duration. Usually girls do better in exam results too. Boys are noisy, so get scolded by teachers more.

Two of her cousins stopped coming to school because they failed in tenth standard. But she is not aware of anyone who has dropped out of school from their area. *"My own cousin has stopped coming to school forever, but she simply doesn't have the drive to come. Her parents never stop her, neither there is any reason why she stopped; she stays at home only. If anyone stop coming for many days, they will stop regularity and will not be able to achieve minimum attendance required for appearing for board exams. Every student wants to appear in boards. So, teachers tell us not to miss school for no reason, but if there is some genuine reason it's okay to not come to school."*

My first periods came when I was at school and after that I stayed inside home for three days; those days were holidays. I always come to school when I get periods. Some girls don't come to school during periods. If they get it at school, they go home. I usually come to school every day but do skip sometimes when there is work at home, mother is away, or mother ask me to stay back. Besides that, because of sickness sometimes don't come to school. Teachers do ask us to come to school even if we have periods and only if there is some health problem, they ask us not to come."

Mona feels all facilities in her school are good and she does not think anything more is needed. They get mid-day meal, school dress, shoes, books etc from school; all girls get cycles from ninth standard. They have bank accounts opened from sixth standard as insisted by the school and they get 1100 or 1200 in that account. She hasn't yet seen what has been deposited till now in her account.

She has heard of Swatch Bharat Mission and their teachers have gone to their homes and asked her parents to make toilets at home. They are going to make but yet it has not been made. Her father who is a farmer thinks it should be made and they will make it. But yet there is a habit in the community itself to go to open for defecation.

Case Study # 3

Low SVP Rated School

IDI: Khushi (Age 12 years)- Standard VIII– Govt madhyamik shala– Mahasamund -Chhattisgarh

Observational information

This school was girl's school from std 5th till std 8th. The school has in all 82 students out of which 60 were present. School does not have a principal; one of the senior teachers is working in the capacity of a principal.

Students of this school were not as neatly dressed as the other (high SVP rated) school. There were two bathrooms one for urine purpose and the other one was used for defecation. The one for urinal purpose was completely open, without any shed or gate and had almost no safety/privacy. But there was a soap and tap for hand washing. From the same tap, children drink water and also wash their hands. The second toilet had a western seat but was very untidy and unclean seat with bucket filled with dirty water. Inside there was a soap bar but there is no tap for handwashing. Apart from these two, there are two more latrines, but they are not used and has turned into a store room. There is a dug well on premises which is used as a dustbin by many students.

There is not much focus on hand washing in this school as neither teachers nor students report any such efforts. Handwashing was practiced before the mid-day meal when we visited but the liquid soap pouch used was opened the day we visited only and only few students used this soap to wash hands.

The teachers identified that there were a few dropouts from the school. The reasons told were that they migrated out for work to help their parents or entire family migrated out. Few of them dropped out because they didn't have interest in schools (reasons informed by teachers).

Several students I talked to were aware about the menstruation and informed me about local practices. The school does not have any facility to change napkins or cleaning. Several girls stay home during menstruation because they cannot wash cloth used in the school. In this community girls usually use home-made cloth pad or reusable cloth pad from local market. But the problem is of washing of this cloth which they cannot do in school. A few girls mentioned that they actually come to school during periods because if they are at home they will have to work even when they are in periods so coming to school saves them from this work. These school students also get money, mid-day meal, uniform and books as well and they like coming to school because of this.

Information from IDI

Khushi (name changed) stays in a joint family and enjoys being with them. She likes going to school but sometimes she doesn't. She likes playing sports more than the studies and comes to school in bicycle even though it almost takes 30 mins to reach at school in a group. She has not got her periods but has knowledge about periods.

They have to take water inside the urinal or toilet and if in case they need more water, they have to ask their friends to get it. So, they go in group to the toilets. Children are scared to use the urinal which has no gate and worry that someone will see them. The school is near road and a lot of people cross it. So,

they worry that people will see them. So, they go in a group and other friends stand out while one of our friends is inside. But nobody goes outside in open for urine and latrine even if the school toilet is unclean. Sometimes the latrine is locked so at that time we ask for keys from teachers, but we hesitate a lot in doing so. The toilet used for defecation is far at about 250 meters distance.

Khushi knew about periods because they got a magazine called EHSAAAS, and also it was in their curriculum. And also, her friends and elder sister got their periods, so she has a little idea about how to use a pad. There are few of our friends those who take leave and don't come to school during menses because they have to ride bicycle so they are afraid because their dress will get stained. *"We have a few of our friends those who don't come to school during because they get pain in their stomach. No one in our school changes pads because in this urinal one cannot change as everyone can peep inside and moreover it is not clean and also there is no place where to throw the pads. We use cloths material, how we will wash our clothes in school and even if we wash it where will we put for drying? Myths and believe are there in our society about not to touch anything and also not to go near god and kitchen and also do not burn lamp during periods. While sleep we put another bed sheet. Also, we wash our clothes and put it in sunlight for draining because it has a lot of bacteria.*

We are also given iron medicine from our school to increase the blood cells which you have to take every Tuesday or Wednesday for one year, and also, they give us de-worming medicine to kill the germs and bacteria of our stomach.

In 7th std we had a lesson on hand wash and then only we were told about 6 steps of washing hands, but nobody washes for such a long time. Hand wash soap is kept with our principal which is available always but soap in toilets is not always kept. No cleanliness drives and competition ever happened in our school, sometimes once in a month teacher check our nails and sometimes they don't. Yearly once our teachers take classes on wash and periods but there isn't much idea given on how and why periods come, we should know about it.

I have seen about Swatch Bharat Abhiyan on TV and Mobile; there was one sir who came and taught us yoga and told us about healthy meals which we should eat.

We expect our school urinal toilets to be clean because there are girls who are ashamed of going inside and the toilet is broken from inside so that should be fixed.

Case Study # 4

Low SVP Rated School

IDI: Pooja (Age 13 years)- Standard VII– Govt. Middle School – Bhopal, Madhya Pradesh

School Observation

The school is situated in an interior village- though around 60 km from Bhopal. Children mostly come to school late because girls finish off their work at home and then come to school as per their own convenience. There are also very few girls in senior (8-10) sections. When we reached the school, all villagers gathered and started complaining about poor performance of the teachers. Everyone said school has deteriorated over years. Teacher said villagers don't send their children to school, but villagers said that earlier teachers were good, now not. Girls interviewed also said they lost interest in school due to no control of teachers over mischievous children specially boys. Very poor attendance on the day of visit.

School functions only in two classrooms though there are more functional classrooms. There are few children attending daily so all primary (I-V) and upper primary (VI-VIII) (boys and girls) sit together. School WASH is poor – No functional toilets are available and previously constructed toilets are broken, soiled and difficult to use. But children use them for urination in emergency. For defecation they go outside in open or go home. There is also no water for use in the toilets. Drinking water is sourced from a borewell which is not on premises and a bit far off. The water is hauled by the children and kept in classrooms, but only a few children drink it, and most don't.

Information from IDI

Interview with Pooja (name changed) started in a very noisy situation. The boys of the school were hell naughty and kept disturbing the interview by throwing stones in the metal windows of the room where interview was going on and they teased from outside, uttered dirty words and made all sorts of disturbances. Pooja said, "This is the reason we are not allowed to come to school. The teachers have no control over these boys. Whenever, we speak in the class they start laughing. It makes me upset."

Girls come to school with a lot of aspirations. *"School toh isiliye ate hai ki ayenge to kuch likh padhlenge, par yah koi padhai nehi hoti". We want to learn something from school, at least we want to read newspapers. Last year there were good teachers, so we learned a lot. But the current teachers don't teach well. We don't understand anything and when teachers ask questions we can't answer, or we answer wrong and everyone start laughing. Earlier teachers were very strict, they used to beat children if they didn't learn so children used to study well. But the current teachers neither beat nor teach wholeheartedly".*

Pooja has heard about Swachh Bharat Mission from media. She has seen a lot of houses constructing latrines and some houses are yet to get ones. But they don't use the toilets in school. *"There is no gate in the toilet, girls never go there. Girls go their own homes if there are emergencies. For drinking water, they go to the bore-well outside the school. In the class to they do keep water, but children dip their hands in the vessel, it becomes too dirty. We go home for sanitation as well as drinking water. Food provided in school is also not good. It is most of the times tasteless, uncooked. We eat at home and then only come to school".*

According to Pooja, girl's attendance in the school has gone down drastically. On asking Pooja why so she insisted, "...earlier all girls used to come to school. Even the older ones in standard VIII too used to come to school, but they all got married now. But the new batch of older girls in standard VII and VIII don't come to school regularly. They only come 3-4 days in a month, sometimes don't come at all. When we grow up our household duties increase. It's difficult to reach school after finishing off all the chores. Older people also say grow up girls should not go to school. *"Pehle mein bhi roj school ati thi par aajkall school ane hi kaun dete hai? Ghar se sara kaam karke late ati hun-eek baje, aur teen baje chali jatihun. Bhai log bhi ghar jake bolte hai, school mein padhai kaha hoti hai, school mein toh itni tej gadar ho rahi hai. Tum school mein kya padhne jati ho? Tum tho waha se baith baith ke aa rahi ho, phir mummy papa bhi bolte, kyu jana school, Mat ja"*.

There are so many reasons why girls don't come to school. Sometimes family does not allow, sometimes something happens, sometimes they simply don't wish to come. Lack of toilets or urinals was mentioned with difficulty only after probing a lot about imagining how WAH may affect attendance. She said girls from faraway places perhaps will not come because there are no sanitation facilities. When asked what can be done to bring back the girls to school, she said, "Abb toh pata nehi ayengi ki nehi. Par bathroom hoti, ya pine ki pani ki suvidha hoti toh aacha tha." *Earlier there was a specific open but private place for girls to use called "Ghati", a little away from school. But, now with construction of new roads, people can see, and girls have stopped going there too. Where are we supposed to go now?"*

Pooja has not attained her puberty yet and does not know anything about menstruation. She says no girl in school discuss about it in school. *"Even when I asked mother about why she does not go to kitchen sometimes, she did not say anything."* She has never seen a sanitary napkin in real, with anyone, being distributed or have been sold anywhere. On probing she said she has seen commercial of sanitary napkins advertisements in TV. She has only seen some women throwing away dirty clothes in open.

"Aganwadi-wale ate hai photo khichwane, baki to kuch nehi pata, goliya dete hai, lekin saab phek dete hai".

When asked if Pooja has ever heard of Bicycles being given to girls to come to school, she said she has heard of it a lot but never seen anyone getting it. She herself wanted one but school said she won't get.

Menstruation alone may not be a reason why girls stop coming to school. Marriage too is not a reason exactly why girls drop out of school. But once they stop coming to school after class VIII, they are married off after a year or two.

Pooja blames the teachers for all wrong happening in the school. *"They (teachers) do a ask the boys to sing filmi songs and ask the girls to dance with them. It is not good. What loss for boys? We girls come to school to make our future, we have to convince our parents, leave household chores and come to school. What kind of future will we make singing-dancing at school? It's fun but we are girls, what will people say if people see us playing and dancing with boys? we can't forget what we are, Ladki hoke apna jaat toh mat bhulo, it happens all the time. No studies in school at all."* However, there is no complain of touching or physical mis-handling of girls.