

**ADOLESCENT GIRLS ANAEMIA CONTROL PROGRAM
GOVERNMENT OF GUJARAT
(DEPARTMENTS OF HEALTH & EDUCATION)**

Summary Report



By

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Brief Overview

Adolescent Anemia Control Program for Girls in Vadodara District

1. Background

Vadodara District has 426 secondary schools with more than 65,000 adolescent girls enrolled in standards 8th to 12th that includes urban, rural and tribal areas. Prevalence of anemia (hemoglobin value < 120 gm/L of blood) in these schools was 74.7% and serum ferritin levels were also low in a UNICEF supported base line study (Kotecha et al, 2000) of 30 schools covering 2860 schoolgirls (12 –19 years). With this background, the Government of Gujarat (Department of Health & Family Welfare and Department of Education) initiated the “Adolescent Girls’ Anemia Control Program” for the adolescent girls in all the secondary and higher secondary sections of Vadodara District from March 1st 2000 with technical and financial support from UNICEF and the Department of Preventive and Social Medicine, Medical College Vadodara. The project has the following aims and objectives:

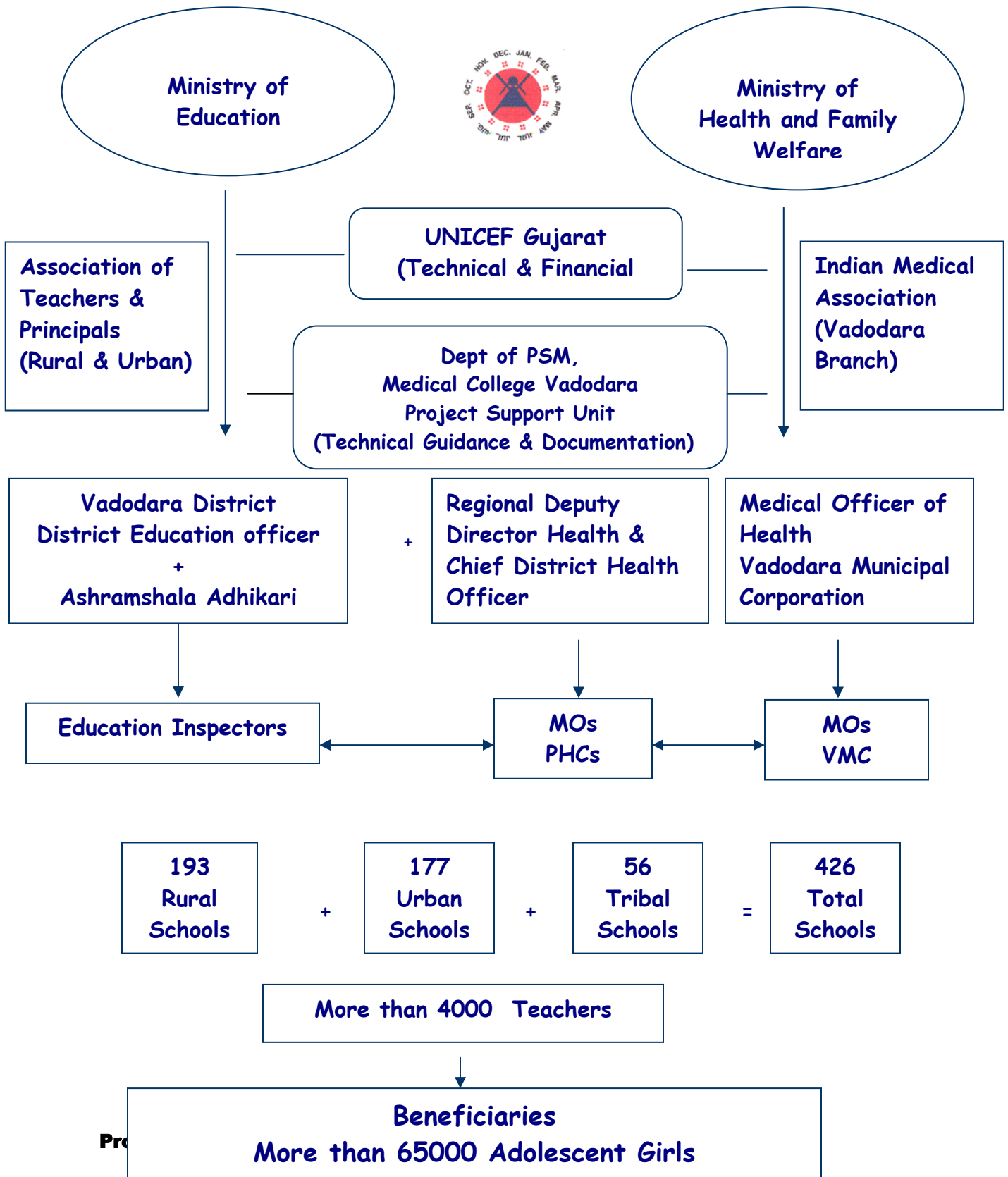
1.1 Program Aims

1. To institute school based, supervised weekly IFA supplementation with an in-built compliance monitoring system.
2. To provide nutrition education to the beneficiary girls and teachers in order to effectively modify dietary behavior and thereby improve the intake of iron available from the food.

1.2 Program Objectives

1. To ensure that 90% of adolescent (13-19 year) girls in schools and 70% of out-of-school participate in weekly consumption of IFA tablets under supervision
2. Anemia prevalence in adolescent girls reduced by 50% by the end of the project period (three years).
3. Improved dietary practices are observed in at least 25% of the adolescent girls both in and out of school setting by project end.
4. State Government adopts the project strategy for replication.
5. Identify and strengthen at least one institution in terms of its capacity to provide technical support.

Adolescent Girls' Anemia Control Program Vadodara District

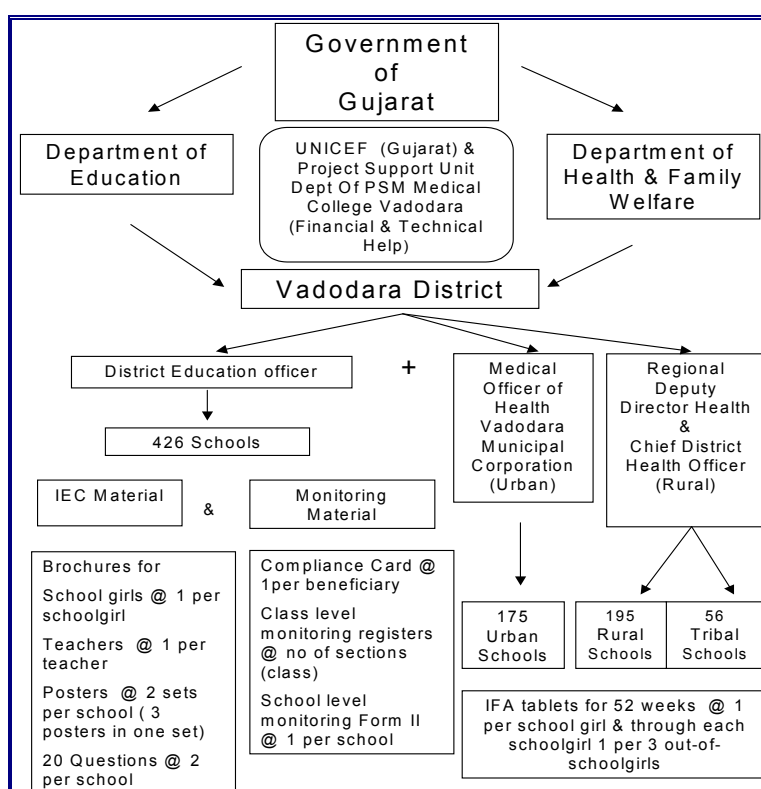


1.3 Program Strategy and Implementation

1.3.1 Preparatory Activities

Medical College, Vadodara and UNICEF Gujarat jointly held sensitization meetings with the district authorities, school principals' and teachers' organization at the District level. This was followed by project logistics (Figure 1), which the District Education and District Health Offices completed efficiently and in time.

Figure 1
Logistic of Supplies to 426 Schools of Vadodara Districts



1.3.2 Information Education and Communication (IEC) material

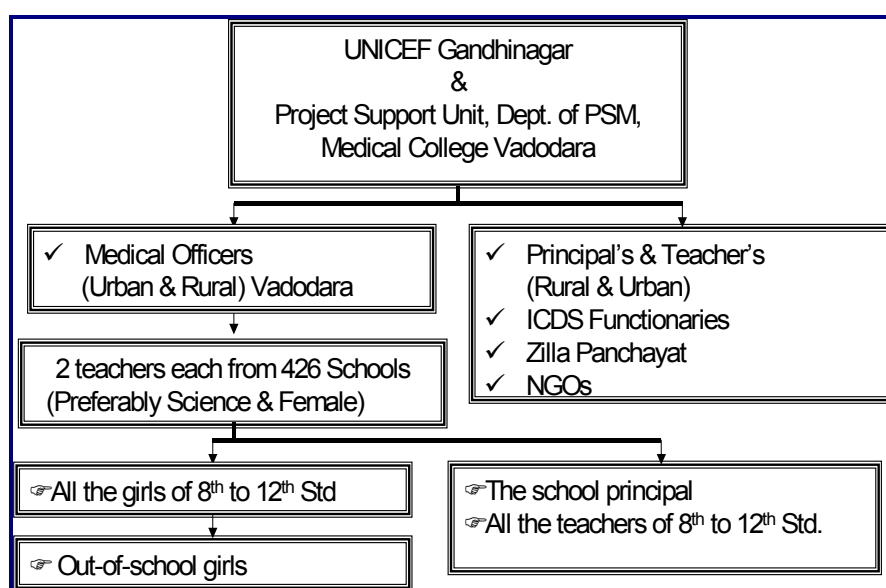
The Government of Gujarat and UNICEF office Gujarat prepared IEC material with technical input from the Department of Foods and Nutrition, Faculty of Home Science, M. S. University of Vadodara. This included posters & brochures with culturally relevant IEC messages in local language on anemia control in adolescents.

1.3.3. Training

The Department of Preventive & Social Medicine, Medical College, Vadodara trained all medical officers. Medical Officers of the nearest Primary Health Center in turn, trained

two teachers from each school for rural and tribal areas and Medical Officers of the corporation trained teachers from the urban schools (Figure 2). Interactive and skill-based training of teachers included logistics, use of IEC material, self-monitoring by the beneficiary girls, use of reporting format and addressing of the side effects of tablets. Posters and brochures meant for the girls and teachers were explained in details and how to use them was emphasized in the training. Teachers so trained went back to the school and trained all other teachers of the school.

Figure 2
Orientation, Sensitization & Training Conducted at Different Stages of the Program



1.3.4 Launching of the Program

On 28th June 2001, a high profile launch of the project by the State Minister for Health, the State Minister for Education and UNICEF Chief for the country highlighted the political will and commitment for this program. Honorable Health Minister formally named the program as “*Kanya Kumari*” literally meaning adolescent girl.

1.3.5 Intervention under the Program

Secondary Schools with support of the Health Service of the state carry out the weekly supplementation of IFA for schoolgirls on fixed day of the week (Wednesday) under the direct supervision of class teachers or class monitors. Each IFA tablet contains 100mg elemental Iron and 0.5mg Folic Acid. Nutrition education is imparted with the help of the IEC material prepared for every girl child and every teacher.

IEC material for the project:

1. Brochures for girls (1 per girl)
2. Brochures for teachers (1 per teacher)
3. Posters (2 sets per school)
4. 20 Frequently Asked Question (FAQs) booklet on Anemia (2 per school)

Brochures for girls

The brochures are arranged in two rows of five. The top row includes: 1) A title page with a central illustration of a girl and text in Gujarati. 2) A page with a photo of a boy and text about anemia symptoms. 3) A page with photos of a girl's face and hands, discussing iron deficiency. 4) A page with photos of children and text about anemia's effects. The bottom row includes: 5) A page with a photo of a girl and text about anemia's causes. 6) A page with a photo of a girl and text about anemia's symptoms. 7) A page with a photo of a girl and text about anemia's effects. 8) A page with a photo of a girl and text about anemia's causes. 9) A page with a photo of a girl and text about anemia's symptoms. 10) A page with a photo of a girl and text about anemia's effects.

Brochures for Teachers

The brochures are arranged in two rows of five. The top row includes brochures on general health, eye care, dental care, and two on nutrition. The bottom row includes brochures on nutrition, eye care, dental care, and a blank page with a logo at the bottom.

Posters

The posters are arranged horizontally. The left poster is titled 'એલીમિયાની પરખ-તમે પણ કરી શકો' (Check for anemia - you can too). The middle poster is titled 'એલીમિયાના ભ્રૂમ ભાગ્યામાં બિન-વેળમપાત્ર કેસ છે?' (Are there non-vegetarian cases among the children of the anemia group?). The right poster is titled 'ખોરાકમાંથી લોહતત્વ મેળવવાના સ્ત્રોત' (Sources of iron from food). Each poster includes illustrations of people and food items, and text in Gujarati.

1.3.6 Monitoring for the Compliance

Girls, teachers, schools and Education Department as part of an inbuilt system of monitoring, monitor the compliance of IFA tablet consumption at the following level:

- ♣ Individual level - Compliance Card (Self)
- ♣ Class level – Register (Class Monitors or Class Teacher)
- ♣ School level - Report (Nodal Teacher and Principal)
- ♣ Cluster level - Observations + Report (Education Inspectors)

Besides this the Medical Officers of the respective areas also provide technical support and supervision of the program as and when required.

A Project Support Unit (PSU) is established at the Department of Preventive and Social Medicine, Medical College Vadodara for technical support, research, documentation and overall monitoring of the project with financial assistance from UNICEF. Professor & Head of the department spearheads this unit.

1.4 Program Coverage

The program is operational in 410 schools covering over 65,000 adolescent schoolgirls as beneficiaries. The average compliance reported for 27 months (July'00 – Sept'02) is about 88% (Figure 3). About 70% of the schools send compliance reports regularly while the other schools continue with the program but are irregular in sending the compliance reports. The second phase of the program was initiated in many schools from January 2001, in which the strategy is reaching out-of-school girls through schoolgirls using girl-to-girl approach. 75 schools (18%) initiated phase II by March'01 covering over 9000 out-of-schoolgirls (Figure 4).

1.4.1 Side Effects

Common side effects reported by beneficiaries are pain in abdomen and nausea. They are usually associated with consumption of tablets on an empty stomach. These effects declined on continuation of tablets and taking the tablets after food. Mid term impact evaluation gives more details about it in the later part of the report.

1.4.2 Response to the Program

Most of the schools have enthusiastically initiated the program and have conducted various IEC activities to motivate and bring about awareness among the girls and their parents. The individual feed back from students, parents and teachers has been very encouraging. The support of the Indian Medical Association has also been significant in spreading awareness about the program. The District level Principals' Association and

burden and drudgery, for whom tiredness and lack of interest in life were common, are now having new enthusiasm, capacity and interest in mental and physical work and enhanced ability to prosper academically with the intervention of the IFA tablets.

Teachers' Association have played a very important role in supporting the program and have been enthusiastic and helpful to the program at all the levels from planning to evaluation. The monthly magazine of teachers and principals reported the program in detail and emphasized the importance of the program. "*Patrasetu*" a monthly health related magazine has devoted one issue exclusively for the program.

1.4.3 The District level Coordination Committee

The District level Coordination Committee has the District Education Officer, *Ashram Shala Adhikari* (Education officer for tribal Schools), Chief District Medical Officer of Health, Medical Officer of Health (Municipal Corporation) and Project Coordinator and Professor from the Project Support Unit, Medical College Vadodara as the members. The committee reviews the progress regularly at least once in two months.

Figure 3
Compliance of the Schools

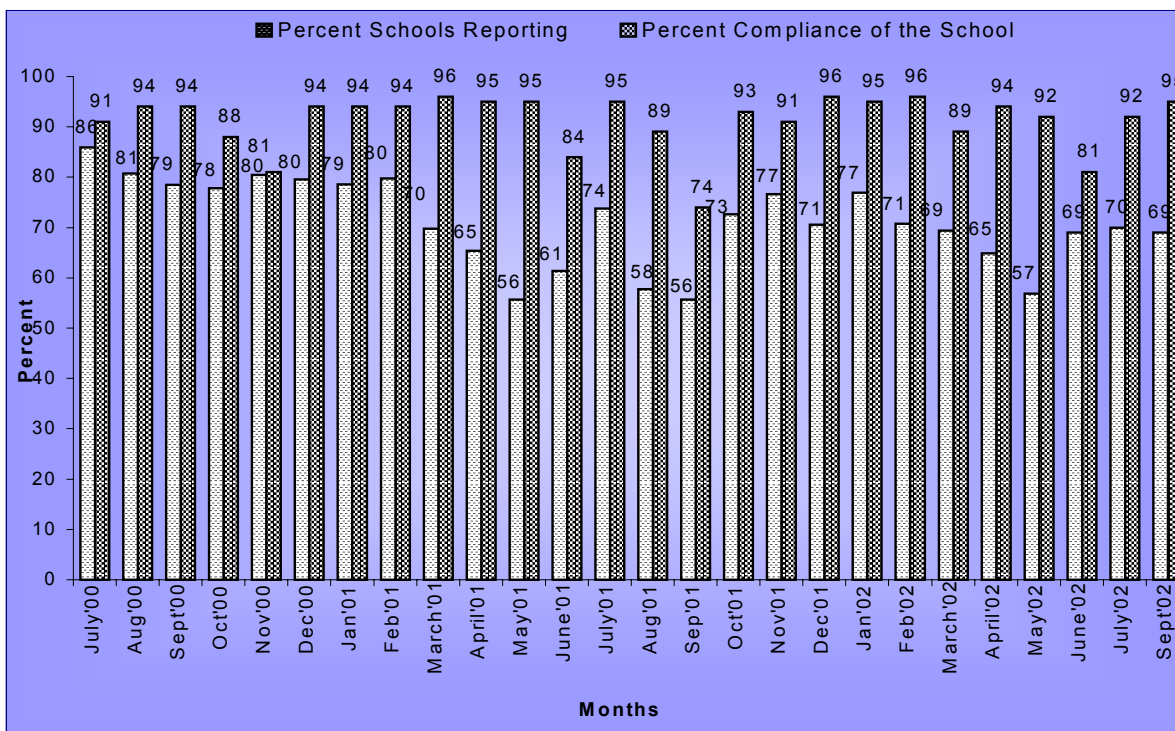
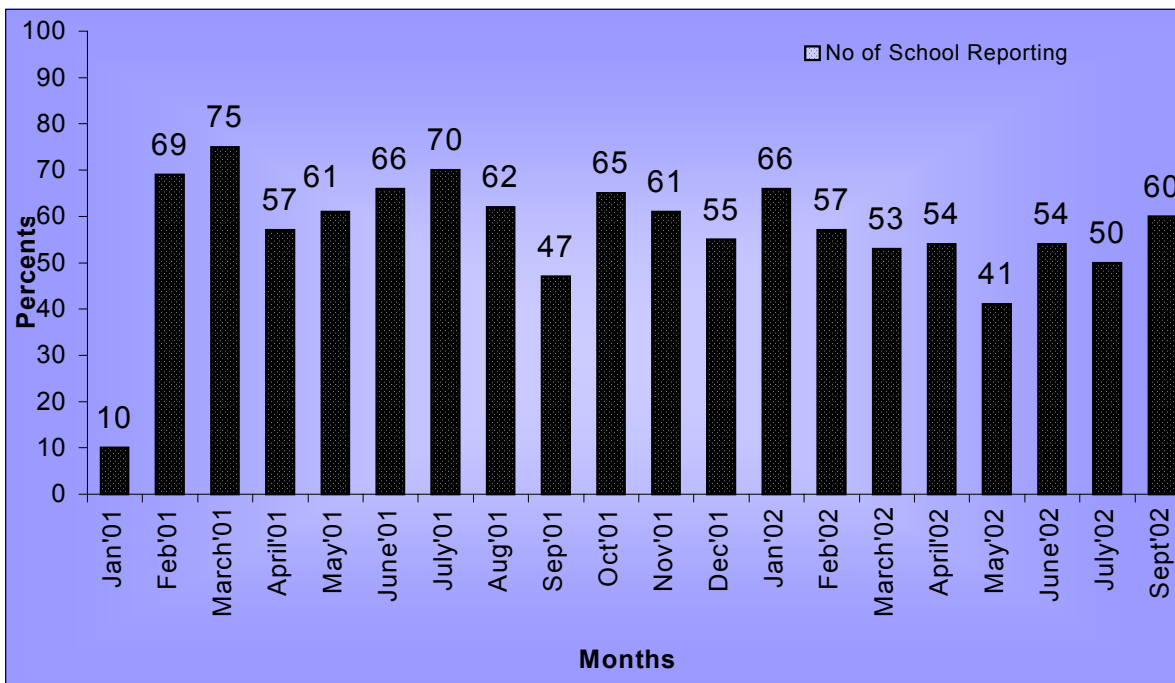


Figure 4
Schools Reporting For Out-Of-Schoolgirls



Voices Of Parents:

- 👉 *It is praise worthy to learn that according to Gujarat State Nutrition Policy the tablets are actually being given! The quality of the tablets is good. My daughter gets few side effects of pain in abdomen and giddiness some times. However, overall I am convinced that the tablet is beneficial and therefore I encourage her to take it regularly.*
- 👉 *My daughter's performance in studies has really improved.*

V

- 👉 *I don't feel breathlessness while running.*
- 👉 *While cycling to school I don't feel tired.*
- 👉 *By taking the tablets my health remains good and I don't fall sick very often.*
- 👉 *Before taking these tablets while playing and doing work we used to feel tired, but after taking these tablets we now feel less tired and feel active. After taking these tablets we feel more enthusiastic than before, we can concentrate more while working as well as while doing work. We can take part in games with more interest.*
- 👉 *After I started this tablet I attend the school more regularly.*

2 Impact Evaluation Survey

2.1 Need for Measuring the Impact

The ultimate objective of the program is to improve the poor iron status of the adolescent girls. There are two approaches adopted for achieving this objective. One is to supplement with IFA tablets and the other is to provide Nutrition and Health Education. Thus impact evaluation was carried out with aims of measuring the change in the haematinic status of the girls and studying the extent of the knowledge related to anemia and its control.

2.2 Study Objectives

1. To measure the anemia prevalence, hemoglobin level, serum ferritin levels and see the difference if any before and after intervention.
2. To study the utilization of IEC material and dietary practices with reference to intake of iron rich foods and vitamin C rich foods.
3. Evaluate the compliance of IFA supplementation for the schoolgirls and out-of-schoolgirls using existing school based records and self-reporting by the girls.

2.3 Methodology

2.3.1 Sampling

The sampling for the baseline study was stratified random sampling according to the area. The principle of sampling remained same as for the base line study. For better comparison same 30 schools taken at baseline, 10 from urban, 10 from the rural and 10 from tribal areas were requested to participate in the evaluation of the program (Annexure – 1). As the girls studying in 8th standard were not beneficiaries in the previous year, the sample was drawn from standards 9th to 12th.

2.3.2 Sample Size

The sample size for two proportions: comparison of 75% and 70%, with a precision of 5% and power of 80%, was 1291 and with a power of 90% was 1715 in each group (Epi_Info 6.04d). Considering the cluster design, and two-stage sampling, the target sample was taken as 3000 for the current study. Hundred girls from each school from the standards 9th to 12th were requested to participate in the blood collection and self-administered structured questionnaire completion. Due to the possibility of refusal or absenteeism, teachers selected more than 100 girls in some schools while in other

schools there were less than 100 girls. However all those girls who participated in the base line study and were still in the school were selected on a priority basis to obtain paired data. Each area, when added up, gave more or less equal number of girls.

2.3.3 Ethical Issues

Taking into consideration the ethical issues, participation in the blood collection was voluntary. Girls were allowed to refuse to participate at any stage of the study. Those detected severely anemic were advised therapeutic treatment.

2.3.4 Investigators

Postgraduate students from the Department of Preventive and Social Medicine, Medical College, Vadodara carried out data and blood sample collection from the schools under the direct supervision and guidance of the project coordinator

2.3.5 Data Collection

After explaining the girls the purpose and assuring confidentiality, a pre-tested structured proforma in Gujarati (vernacular) language was given to them and the girls were guided question by question for filling it up. The measurement of height and weight was done after which her blood was collected using vacuumed test tubes. The blood tubes so collected were stored in a vaccine carrier and were brought to the Central Laboratory of the Medical College, Vadodara for analysis.

2.3.6 Hemoglobin Estimation

For Hemoglobin Estimation ABACUS Cell counter (Made in Austria) was used. The method that the cell counter used for estimation of hemoglobin is an adaptation of the standard manual cyanmethemoglobin method. Quality control measures were taken to ensure accuracy of readings and counter check by chemistry analyzer measurements.

2.3.7 Serum Ferritin Estimation

Serum Ferritin Estimation was done with the help of Dr. Toprani a senior practicing Pathologist at his laboratory using Immulite (Automated Immunoassay analyzer)

2.3.8 Data Cleaning and Quality Assurance

The data set were entered in to the computer into Epi_info record format separately by two different data entry operators and then the files were tallied for mistakes if any for numeric variables and corrected.

3 Results & Discussion

Keeping the objectives of the impact evaluation in mind, the results are discussed comparing present data with the baseline data for changes in hematological findings.

A total 2766 sample was available for final analysis, including 1016 girls for hemoglobin and 665 for serum ferritin for paired analysis with the baseline data.

3.1 Reduction in Anemia Prevalence

Anemia prevalence (Hb < 120 gm/l) was recorded as 53.2% compared to baseline anemia prevalence of 74.7%. There was a reduction of 21.5% in anemia prevalence after the initiation of the program (Figure 5). Figure 6 shows change in anemia prevalence at different cutoff point.

3.1.1 Difference in Anemia Prevalence by Area

The reduction achieved is the maximum in rural areas followed by urban areas with both

This impact evaluation study showed that the coverage of the schoolgirls to an extent of 90% is achieved and a reduction of 22% in anemia prevalence has been observed. Almost three fourth of the girls have improved their hemoglobin. This success story resulted from the efforts of the enthusiastic teachers and the interest and enthusiasm of the girls. Girls are enthusiastic everywhere; the crucial determining factor for success is the interest and efforts of the teacher.

showing a net reduction of over 23%, while the tribal areas showed a reduction of anemia by about 16% (Figure 7). This could be because of difference in the compliance of IFA tablets consumption by the girls or because of inherent differences between the areas, in particular higher prevalence thalassemia trait in tribal girls. When these data were viewed using a cut off point of

11.5gm/dl & 11.0g/dl instead of 12.0gm/dl the improvement of iron status was seen in tribal area similar to rural and urban (Figure 8). This suggested that using a cut off point of 12.0 g/dl for tribal population is number and the interpretation would be erroneous if we insisted on that cutoff as seen in this study.

3.1.2 Rise in Hemoglobin

Mean rise of hemoglobin is seen to the extent of 6.4 gm/L with regional differences and maximum rise is seen in rural areas followed by urban areas and relatively the least rise is seen in tribal area.

3.1.3 Difference in Anemia Prevalence by Age

There is a consistent decline of anemia prevalence across all ages with rise in median hemoglobin after intervention as compared to the levels of before intervention (Figure 9)

3.1.4 Severity of Anemia

Severe anemia prevalence reduced from 1.6% at base line to 0.5% suggesting a reduction of 68% in severe anemia from the base line value. Similar reduction values for moderate and mild anemia are 51% and 22% points. The proportion of normal (non anemic girls) increased from 25.3% to 46.8% suggesting a rise of non-anemic girls by 85% from the baseline non-anemic level (Figure 10). Thus, the benefit of the program is reaching almost every participating adolescent girl and not restricted to 22% girls who turned to non-anemic status from anemic status.

3.1.5 Change in BMI Status

Overall after intervention, there is an improvement in BMI among the girls in the present study as compared to baseline and the difference is statistically significant.

3.2 Ferritin Status

A total of 804 samples were studied for serum ferritin in the present study.

The proportion of girls having serum ferritin less than 12 ng/ml, indicative of poor iron storage (WHO, 1968), declined from 49.7% to 39.4% and is consistent in all the areas.

The mean value of ferritin has increased by 5 ng/ml across all areas.

3.2.1 Age and Serum Ferritin

Median ferritin of the group increased from 12ng/ml to 16.5 ng/ml and the improvement is across all ages. The decreasing trend in serum ferritin with age seen at baseline was less evident after intervention (Figure 11 & 12).

Figure 5
Hemoglobin Curve Before and After Intervention

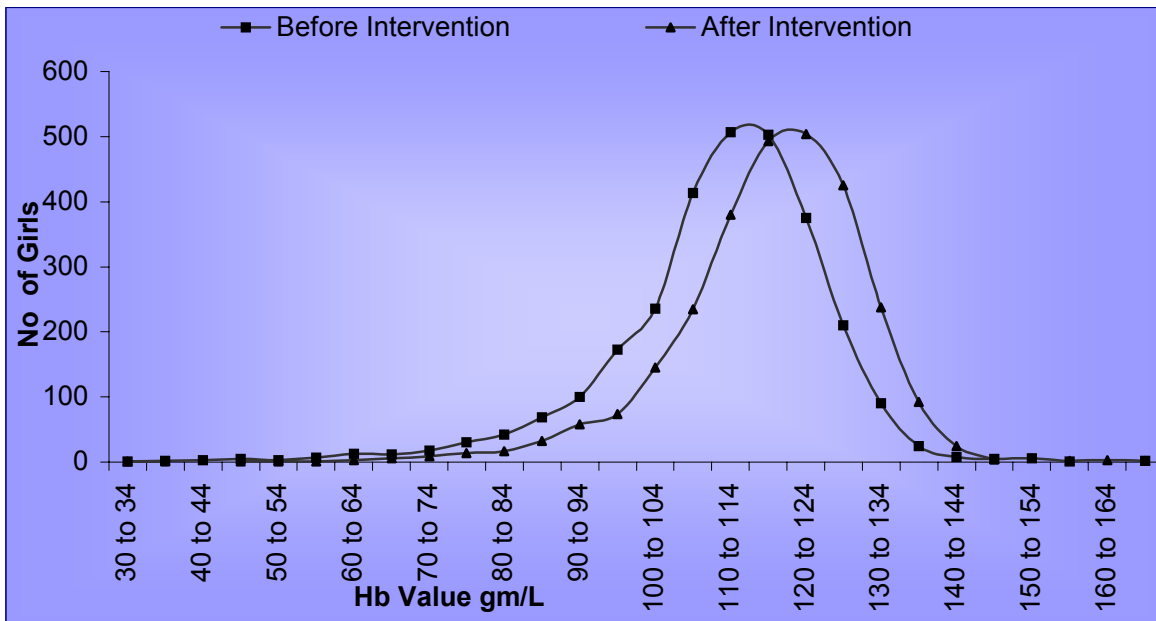


Figure 6
Prevalence of Anemia at Difference Hemoglobin Cut off Points Before and After Intervention Un-paired Data (Total) (n=2766)

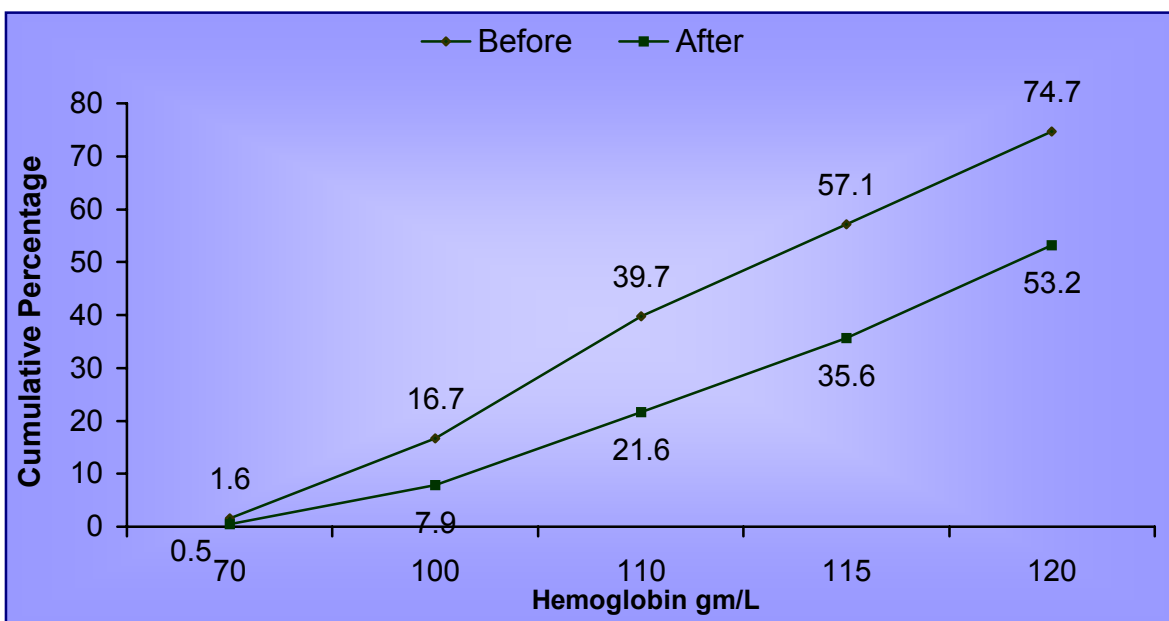


Figure 7
Prevalence of Anemia Before and After Intervention

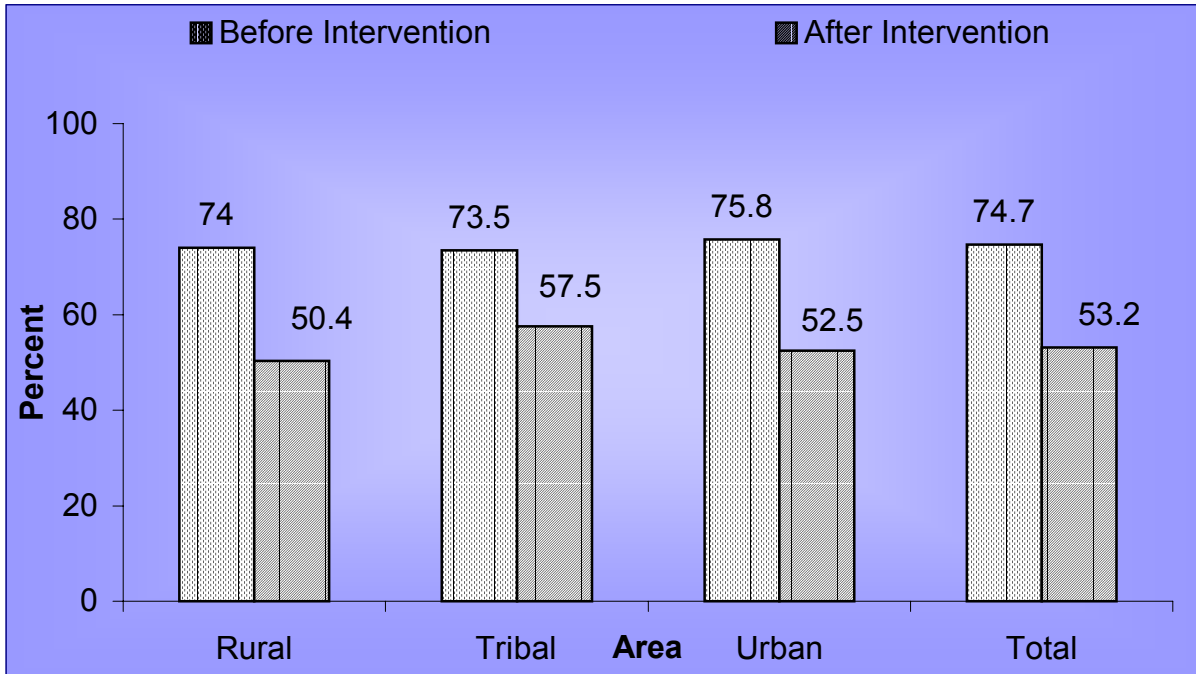


Figure 8
Prevalence of Anemia Before and After Intervention
At cut off point of Hb<11.5gm/dl

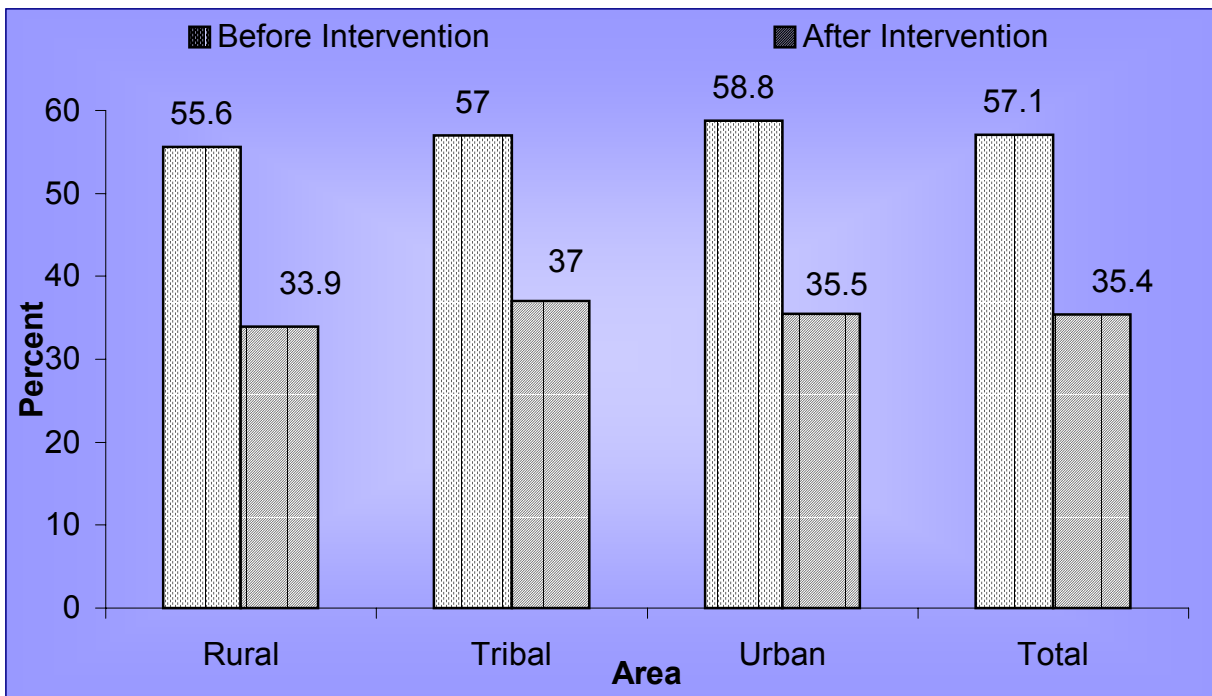


Figure 9
Age Wise Median Hb Values Before and After Intervention

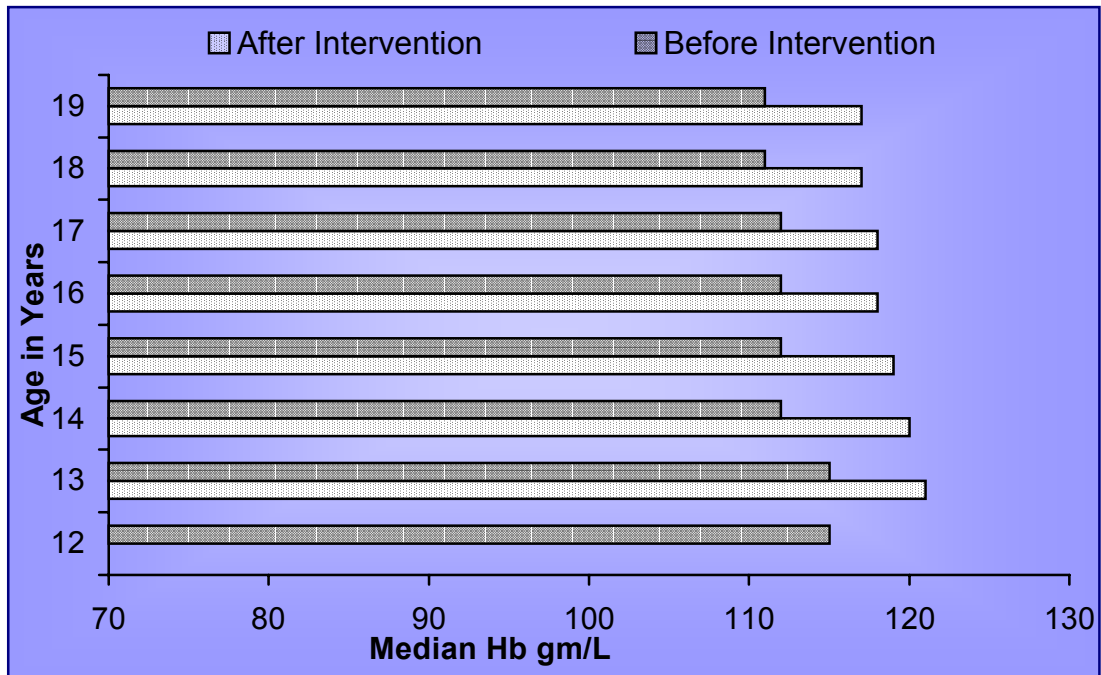


Figure 10
Severity of Anemia Before and After Intervention

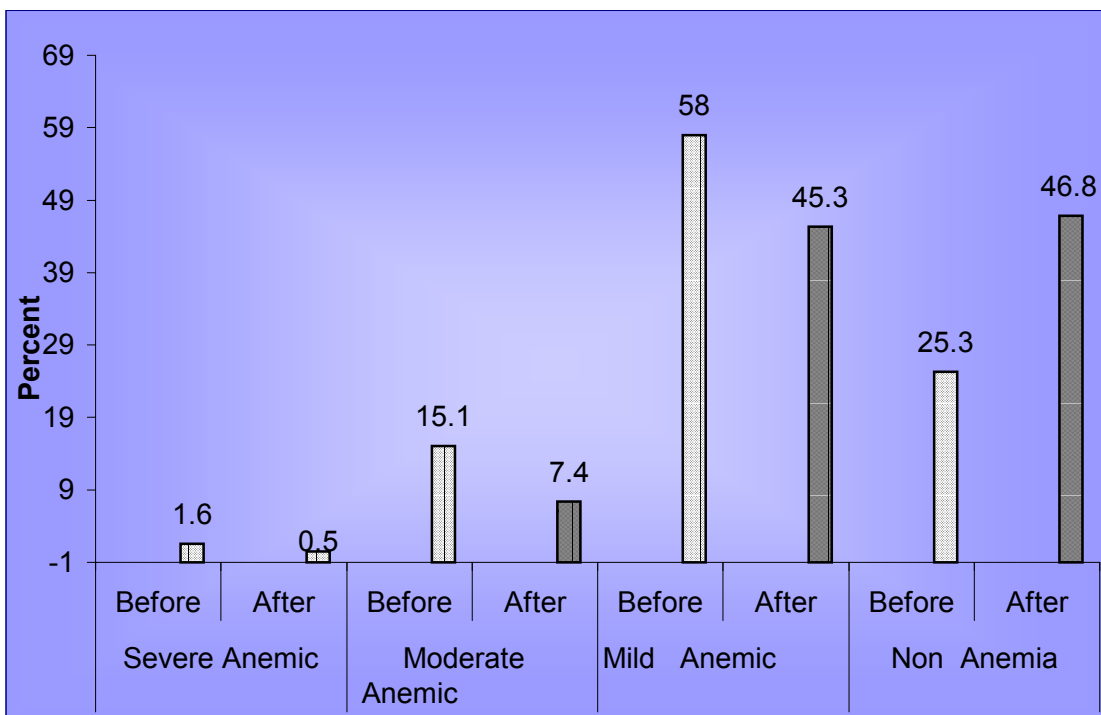


Figure 11
Age and Median Serum Ferritin and Median Hb value Before Intervention

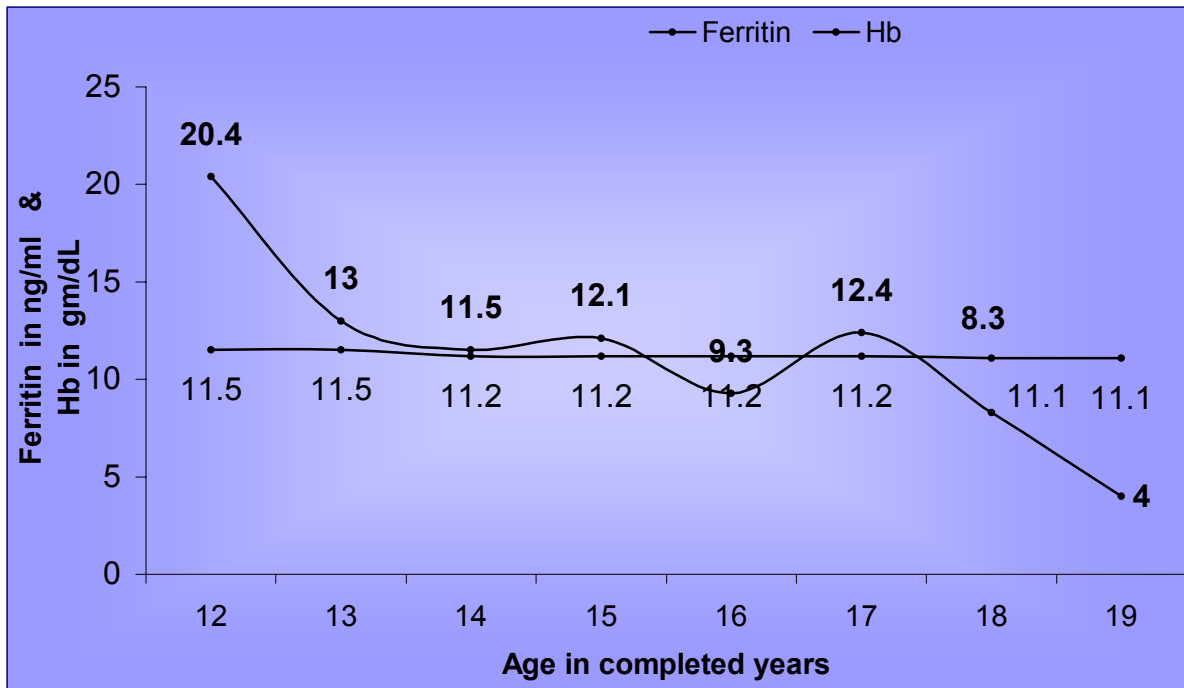
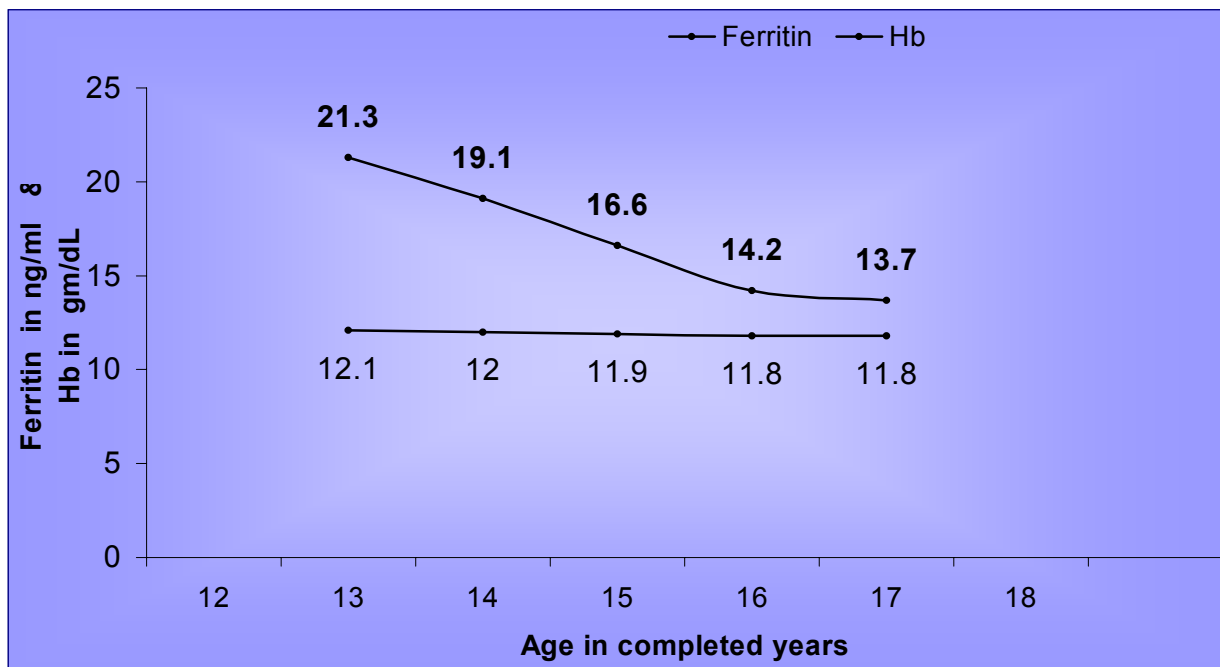


Figure 12
Age and Median Serum Ferritin and Median Hb value After Intervention



3.3 Paired Data Analysis

For paired analysis, the data for 1016 girls were available for hemoglobin comparison and 665 were available for serum ferritin comparison. The information obtained from these paired data is more convincing as regards impact of intervention as all other confounders are controlled, this being the very design of the paired data.

Data from the paired set and overall data both before intervention and after intervention are comparable. This confirmed that generalization is possible from the total data set as suggested from the paired inferences. (See Summary Table)

3.3.1 Anemia Prevalence among Paired Data

Change in anemia is better indicated in the paired data (Figure 13). One third (34.9%) of anemic girls became non-anemic. One-fifth (19.8%) non-anemic girls, that is 5.1% of the total girls (52/1016) girls turned anemic! Net Result is 20.8% (74.2% - 53.4%) reduction of anemic prevalence. (Table 1)

Mean hemoglobin value increased in girls who remained anemic and who remained non-anemic during intervention with those who turned non-anemic from anemic.

There is a maximum reduction of 25.2% of anemia among urban areas followed by rural areas where a reduction of 22.8% is observed. Minimum reduction is achieved in tribal areas to an extent of 12.7% only. Two possible explanations for the least reduction in tribal areas are

1. Higher prevalence of thalassemia trait in tribal girls leading to poor response to IFA supplementation in comparison to normal girls.
2. Compliance and/or regularity of IFA consumption may be less in the tribal areas as compared to the other two areas.

When stratified analysis was done using surname for tribal girls where thalassemia is common, the reduction achieved was higher among non-tribal groups than overall data, while in the tribal girls, there was no difference observed in prevalence confirming the role of thalassemia among tribal girls. However at lower cut off points improvement was seen. (Figure 14 & 15).

3.3.2 Serum Ferritin among Paired Data (n = 665)

About half (50.1%) of the girls had serum ferritin value less than 12 ng/ml at the base line while after the intervention it is reduced to 41.4%, a reduction of 9.7%. (Figure 16)

Mean and Median serum ferritin values also improved after intervention. (see summary table).

Figure 13
Change in Anemia Prevalence - Paired Data

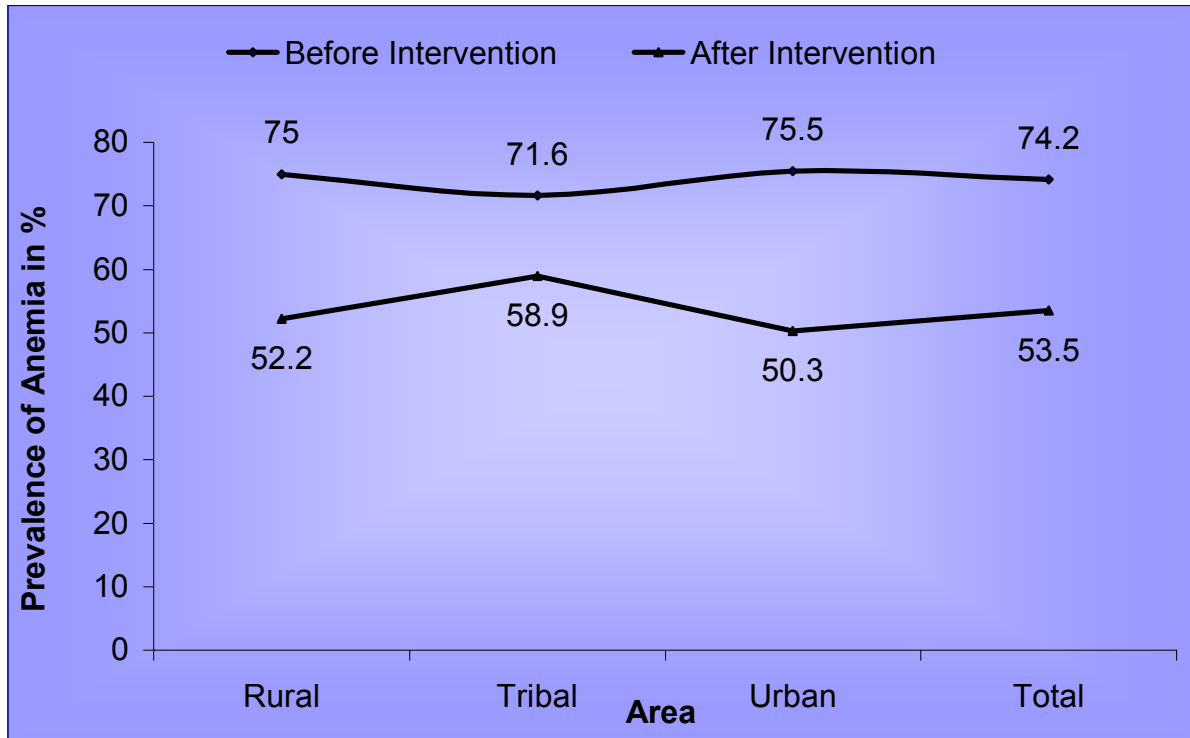


Table 1
Change in Anemia Prevalence (Paired Data)

	Before Intervention Anemic	Before Intervention Non Anemic	Total
After Intervention Anemic	491 65.1%	52 19.8%	543 [53.4%]
After Intervention Non Anemic	263 34.9%	210 80.2%	473 [46.6%]
Total	754 [74.2%] 100%	262 [25.8%] 100%	1016 (100%) 100%

Figure 14
Prevalence of Anemia at Different Hb. Cut off Points
Before and After Intervention Paired Data (Total) (n=1016)

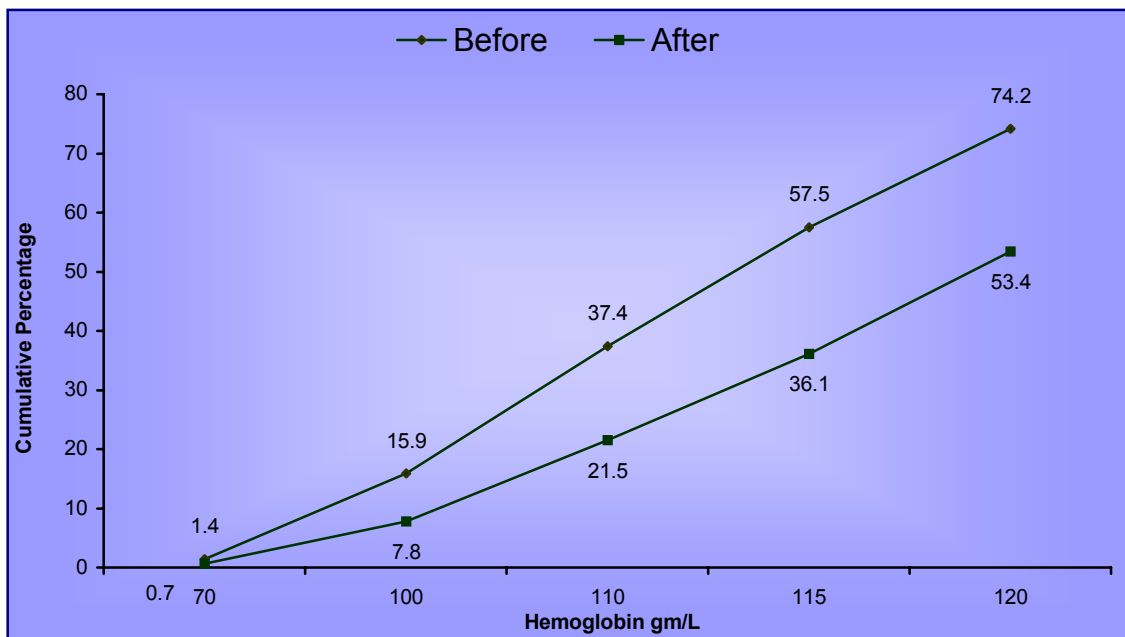


Figure 15
Prevalence of Anemia at Different Hb. Cut off Points
Before and After Intervention Paired Data (Tribal) (n=218)

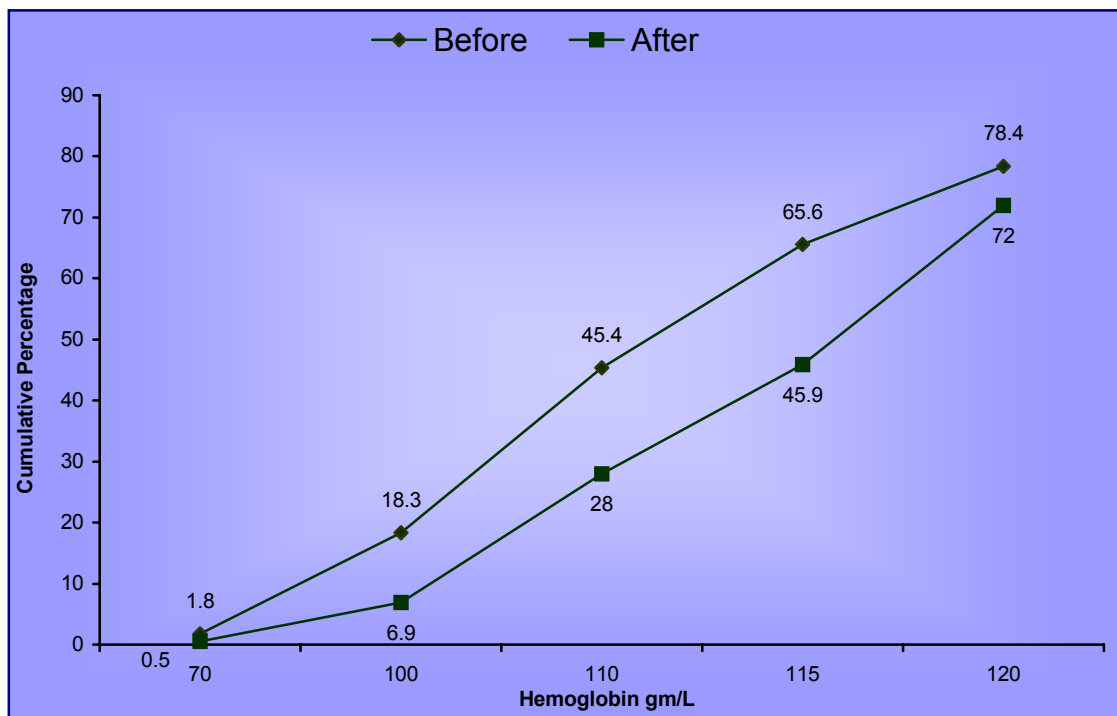
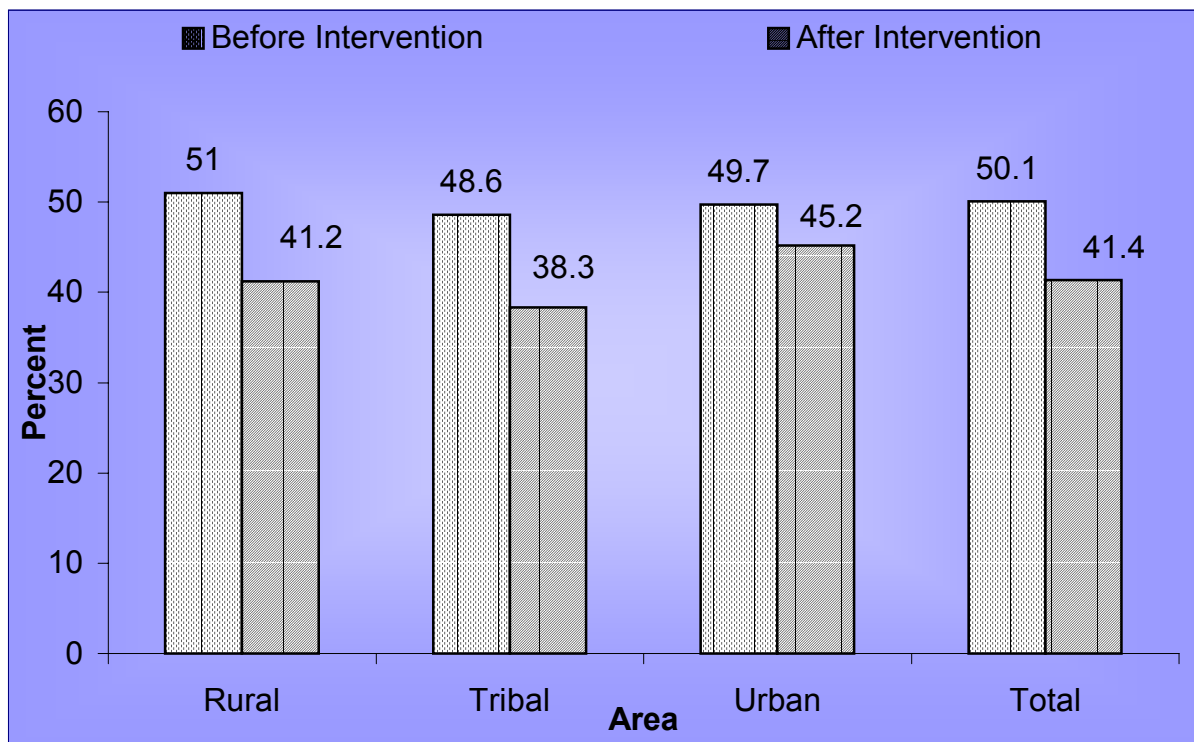


Figure 16
Serum Ferritin < 12 ng/ml - Paired Data



3.4 Utilization of IEC Material by the participants

3.4.1 Brochure

Three fourth (72.4%) of 2766 girls mentioned that they received the brochure: more rural and tribal girls reported this as confirmed to urban girls. A majority (87.2%) of the girls had read the brochure, either all by them selves (57.2%) or with their friends (55.1%) or with their teachers and friends (23.1 %).

3.4.2 Recalling the Messages of the Brochure

When asked to recall up to 3 messages from the brochure, 56.3% did not respond. From those who responded 99% had at least one correct message recalled.

3.4.3 Posters

All the schools were given two sets of three posters each and during the training were also explained where to display them and how to use them for educating girls. However, only 37.8% of the girls had actually seen posters related to anemia program in their school. Of the girls who had seen the posters 42.6% girls were able to recall at least one correct message from the poster.

3.4.4 Knowledge of Girls regarding Anemia Prevention & Treatment

Based on the IEC provided to the girls, questions were asked regarding anemia prevention and treatment.

3.4.4.1 About Anemia

Majority of those who responded (90%) were able to give correctly the name of condition of pale blood; anemia or “*Pandurog*” – the Gujarati equivalent of anemia.

3.4.4.2 Causes of Anemia

When asked whether deficiency of any nutrient can lead to pale blood, 66.6% of the girls could correctly reply. However when asked to name the nutrient which leads to pale blood, only 12.1% of those had correctly answered, mentioned iron or “*Lohatvatva*”, while the rest referred to other nutrients like protein, vitamins.

3.4.4.3 Signs, Symptoms & Treatment of Anemia

When asked about symptoms of blood only 44.2% girl stated one or more signs, symptoms or consequences. 7.5% mentioned 3 or more correct signs or symptoms of anemia. When asked about what can we do to prevent or treat pale blood, 37.3% suggested taking iron tablets or iron rich food or vitamin C rich food or avoiding tea and coffee along with snacks and food. About 2% stated three correct preventive actions, 20.6% gave wrong answers and 42.1% did not respond.

3.4.4.4 Diet and Anemia

About half (45.5%) of the girls stated that one should avoid taking tea/coffee along with food/snacks and 16.8% of these girls gave correct reason i.e. tea or coffee inhibits iron absorption / tea or coffee makes the blood pale / tea or coffee causes anemia / tea or coffee reduces hemoglobin. More urban girls compared to tribal girls and rural girls could give the correct reason.

3.4.4.5 Iron Folic Acid Tablet

When asked about the name or content of the tablet given to them, a large number (56.1%) did not respond to the question. Only 22.1% referred to iron and 21.8% gave wrong answer like iodine, calcium, vitamin C etc. Tribal girls knew the least.

About half (52%) of the girls stated benefits of the tablet. Of these girls 94.6% were able to list at least one advantage of tablet. Area wise 96.5% urban girls, 95.7% rural girls and 89.8% tribal girls were able to list at least one correct benefit. Overall 40.1% knew three correct benefits of the tablet.

To summarize the findings emerging from this section of the study, IEC material has been received and read by most of the girls. However the understanding of messages and retention of information have been not fully satisfied. There is neither an inbuilt system nor any effort made to reinforce the messages to the girls from the IEC material supplied. IEC material use has further scope for improvement. In fact the improvement of anemia status as seen here without much change in their knowledge suggests that if frequently and proper use of IEC material had been made, the reduction in anemia could have been further enhanced.

3.5 Compliance Reports for IFA Supplementation

Routine monitoring system reported compliance at 89% average for 17 months prior to evaluation. With an objective to evaluate the routine compliance reports received as part or regular monitoring by Education Department and to find out the incongruence if any between the reports obtained from the schoolgirls and routine reports received, girls in this study were requested to give information related to the compliance of IFA tablets received by them. 95.4% of the girls reported that they consume IFA tablets given to them in their schools. The compliance was more in rural schoolgirls (97.9%) than tribal (95.6%) and urban girls (92.7%). However 40.2% of the girls were regularly taking tablets while the rest of those who were taking IFA tablets missed them once in a while. Thus reports received by regular monitoring system and that obtained by direct questioning to the girls tallied reasonably well in terms of whether they receive tablets. However forgetting to take tablets once in a while by 60% girls indicates two lapses: one of the compliance and other of the supervised supplementation.

Two fifth (40.7%) girls took the tablets some of the other time on empty stomach and 8.4% took the tablets regularly on empty stomach, which is a matter of concern.

3.5.1 Compliance during Summer Vacation

When asked whether the girls were given tablets during vacation or not, 92.8% girls confirmed to have received tablets but only 72.1% girls consumed them.

3.5.2 Use of Compliance Card

Receiving compliance card was acknowledged by 92.5% of the girls. However only 34.8% of the girls had the compliance card with them while 52.5% girls' cards were with their teacher and 12.4% girls' cards were with their class monitor. Further, only 55.5% of the girls put a cross in their compliance card when they took tablets while for 20.6% of

the girls their teacher used to put a cross and for 19.9% of the girls their class monitor used to put a cross. Thus compliance cards, which were designed for self-monitoring of compliance by the girls, did not serve the purpose in over 50% of the girls.

3.6 Benefits & Side Effect of Tablets Mentioned by Girls

Initially 29.7% of the girls had complaints of side effect, which reduced to 14.3% by the end of one year. The common side effects experienced by girls were stomachache, vomiting, giddiness and nausea. None of the side effects were serious enough to compel them to discontinue the tablets.

Benefits after taking tablets were experienced by 50.7% of the girls. Area wise, 61.0% rural girls reported benefits compared to 48.8% urban and 39.9% tribal girls. The common benefits experienced by girls were increased work capacity (21.9%), blood improved (16.4%), health improved (7.2%), decreased pallor (5.1%) etc.

3.7 Reaching Out-of-Schoolgirls

The phase II of program envisaged reaching these out-of-school girls by various approaches, one of them being to reach them through the schoolgirls. There was an effort made by about 85% of the schools to initiate the approach to reach out-of-school girls, 75% of the girls received requests to initiate IFA supplementation for out-of-schoolgirls. However only about 20% of the girls could actually initiate the program for out of schoolgirls. Currently out-of-school girls are covered by ICDS Anganwadi workers and that program is successfully expanding. Hemoglobin estimation of Anganwadi worker and including them for the program and intervention proved beneficial.

Blood Collection Of The Adolescent Girls Using Pre-Coded Vacuum Tubes



Out-Of-School Girls Ready To Get Enrolled In The Program Through Girl-To-Girl Approach



4 Conclusions & Recommendations

The weekly IFA supplementation program implemented by the Department of Health and Education of the Government of Gujarat has completed two year. This impact evaluation study showed that the coverage of the schoolgirls to an extent of 90% has already been achieved, reduction of 21% in anemia prevalence has been observed and 73.8% of the girls have improved their hemoglobin. Thus this is success at programmatic level. The efforts of the enthusiastic teachers and the interest and enthusiasm of the girls are pivotal for this success. Girls are enthusiastic everywhere; the crucial determining factor for success is the interest and efforts of the teacher. If the teacher is convinced and committed, the school has an efficient program implementation and if the teacher views the program as 'additional responsibility thrust upon' her/him program does not run.

Further, there has been wholehearted commitment by the Government and good monitoring by the Education Department, associations of Principals and Teachers and genuine support from the Department of Health for training and health education as and when required. A key factor for success is an efficient and built-in-monitoring system of the program.

The program has changed the quality of life of the adolescent girls. Many of these girls for whom the life was a burden, drudgery, for whom tiredness and lack of interest in life were common are now having new enthusiasm, capacity and interest in work, both mental and physical and enhanced ability to prosper academically. For out-of-schoolgirls, the target for reaching up to 70% girls has not yet been achieved. More efforts and innovative approaches are required e.g. through enthusiastic ICDS workers, voluntary organizations and educating through mass media.

Based on the experiences from the present project, the State Government has been able to initiate the project in other districts on the same model as applied in the present project.

The Project Support Unit established at the Department of Preventive and Social Medicine Medical College Vadodara for supporting the program has successfully facilitated the logistics, training, research and documentation, besides successfully supporting monitoring and evaluation of the program.

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Dietary practices improvement based on IEC material has largely eluded us. Due to lack of base line data regarding dietary practices we cannot make comparative statements. Acquiring correct knowledge on anemia based on the IEC brochures and posters has not been very satisfactory. What is required is to explore how best can IEC be used adequately. This may mean more motivation; systematic monitoring of IEC uses and enhanced emphasis on the IEC during training.

Summary Table

Unpaired Data Before and After Intervention			
Parameter	Before Intervention	After Intervention	Statistical Significance
	N=2860 for Hb N=1763 for SF	N=2766 for Hb N=804 for SF	
Anemia (Hb <120g/L)	74.7%	53.2%	p < 0.001
Severe anemia (Hb < 70g/L)	1.6%	0.5%	p < 0.001
Moderate anemia (Hb 70 to 99.9 g/L)	15.1%	7.4%	p < 0.001
Mild anemia (Hb100 to 119.9g/L)	58.0%	45.3%	p < 0.001
Mean \pm SD (Hb in gm/L)	110.8 \pm 14.2	117.2 \pm 12.7	p < 0.05
Median (Hb gm/L)	113	119	p < 0.05
Mean BMI	17.23 \pm 2.7	17.74 \pm 2.6	p < 0.001
Serum Ferritin less than 12 ng/ml	49.7%	39.4%	p < 0.001
Mean \pm SD Serum Ferritin in ng/ml	17.4 \pm 18.8	22.2 \pm 23.6	p < 0.001
Median Serum Ferritin in ng/ml	12.1	16.5	p < 0.01
Paired Data Before and After Intervention			
	N=1016 for Hb N=665 for SF		
Anemia (Hb <120g/L)	74.2%	53.4%	p < 0.001
Severe anemia (Hb < 70g/L)	1.4%	0.7%	p > 0.05
Moderate anemia (Hb 70 to 99.9 g/L)	14.6%	7.1%	p < 0.001
Mild anemia (Hb100 to 119.9g/L)	58.3%	45.7%	p < 0.001
Mean \pm SD (Hb in gm/L)	111.0 \pm 13.7	117.3 \pm 12.9	p < 0.001
Median (Hb gm/L)	112	119	p < 0.001
Mean BMI	17.04 \pm 2.7	18.02 \pm 2.7	p < 0.001
Serum Ferritin less than 12 ng/ml	50.1%	41.4%	p < 0.001
Mean Serum Ferritin in ng/ml	17.2 \pm 19.1	21.4 \pm 20.7	p < 0.001
Median Serum Ferritin in ng/ml	11.9	15.3	p < 0.001

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Annexure – I
List of the School Surveyed with Anemia Prevalence
Before and After Intervention

Sr. No.	School No.	School Name	Anemia Prevalence Before Intervention %	Anemia Prevalence After Intervention %
1	U1	Sharda Mandir High School, Salatvada	63.0	71.4
2	U2	Unnati Vidyalaya Akota	67.5	53.2
3	U3	Panchshil Vidyalaya, Makarpura	77.1	37.2
4	U4	Vab Memo. Girls School, Fatehgunj	82.4	55.2
5	U5	Sharad Kanya Vidyalaya, Shiyabag	85.7	61.2
6	U6	Aryakanya Vidyalaya, Karelibaug	82.4	54.5
7	U7	Satyanarayan Vidyalaya, Lakshampura, Gorwa	73.2	61.9
8	U8	Lalabahadur Shastri Vidyalaya Harni Rd.	81.9	41.1
9	U9	M.E.S. Girls High School, Nagarwada	68.8	31.1
10	U10	Jayshree Kanya Vidyalaya, Dandiabazar	69.5	62.8
11	R1	N.H.Patel Kanya Vidyalaya, Kayavarohan	89.5	57.4
12	R2	Choksi K.K. Girls High School, Padra	79.7	70.2
13	R3	Karkhadi High School, Karkhadi	71.4	36.4
14	R4	M.P.High school, Jarod	71.3	54.6
15	R5	B.L.Patel Sharda Vinay Mandir, Anandi	72.5	43.4
16	R6	D.K.Patel Sarvajanik High School, Thuvavi	77.8	55.3
17	R7	D.C.Chawda Girls High School, Karjan	83.5	40.2
18	R8	B.N. High School, Chandod	73.3	50.0
19	R9	Dabka High School, Dabka	53.8	31.1
20	R10	Sardar Patel Vidyalaya, Darapura	53.2	39.5
21	T1	Don Bosco High School, Chhotaudepur	31.8	58.8
22	T2	Maniben Patel Kanya Vidyalaya, Chhotaudepur	70.1	57.4
23	T3	Iqbal School, Chhotaudepur	72.2	71.4
24	T4	Adivasi Madhyamik Shala, Bhikhpura	66.7	54.0
25	T5	Sarvajanik High School, Pavijetpur	85.6	55.7
26	T6	Adivasi Madhyamik Shala, Dungarwant	86.0	81.8
27	T7	C.N.Vidyalaya, Jabugam	89.7	75.5
28	T8	Shreyas Vidyalaya, Chalamali	70.0	66.7
29	T9	Florspar Nagar Madhyamik Shala, Kadipani	76.7	52.4
30	T10	English School, Kawant	77.6	47.4