

Micronutrient Initiative

ADOLESCENT ANEMIA CONTROL IN INDIA – REVIEW OF IMPACT AND COST OF WEEKLY SUPPLEMENTATION PROGRAMMES

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BACKGROUND

In India the majority of pregnant women and young children and half of non-pregnant non-lactating women suffer from anemia. In order to tackle this pervasive problem effectively and sustainably, integrated interventions must be implemented using a life cycle approach. In a collaborative effort between the Department of Education and the Department of Women & Child Development of the Ministry of Human Resource Development, and the Ministry of Health and Family Welfare, of the involved Indian States, weekly iron-supplementation programmes to control anaemia in adolescent girls were initiated starting in the year 2000. From a global perspective, there is a substantial gap regarding the availability of scientific evidence on the effectiveness of iron supplementation programs. And taking stock of the experience gained by these programmes should generate an important contribution to iron supplementation initiatives in India and in other developing countries.

AIM

To review the effectiveness and related costs of weekly-iron supplementation programmes to prevent anaemia among adolescent girls being implemented in India.

FRAMEWORK

The combined target population of the 13 programmes at the time of this review was estimated to be 8.8 million. All programmes provided adolescent girls with iron/folate tablets (100 mg iron and 400µg of folate) on a weekly basis for a minimum of six months or one year (for two years in one programme) at the time of the impact evaluation. The programmes provided the tablets at school for school going girls (SGG), and through a government programme for non-school going

girls (NSGG). The programmes also included other activities such as counselling, educational materials, monitoring cards, life skills education and deworming tablets. The 13 adolescent anaemia programmes reviewed have a common set of general goals/objectives but were initiated at different times with modifications made in terms of scope and activities in line with state specific issues.

Seven of the 13 programmes have conducted an impact evaluation measuring haemoglobin levels: Andhra Pradesh (AP), Gujarat, Jharkhand, Madhya Pradesh (MP), Maharashtra, Uttar Pradesh (4 projects - with 2 projects in Lucknow and 2 projects in Gorakhpur), and West Bengal (WB).

OUTCOMES

The 7 programmes that had assessed the impact of the intervention revealed statistically significant decreases in anemia prevalence ($p < 0.001$) from baseline to endline (**Figure 1**). Prevalence of anemia at baseline is high across all programs. Prevalence varies from 54% to as high as 99%, both being reported in UP. The decrease in anemia prevalence reported from baseline to endline, varied from 8 (MP) to 50 (UP-Gorakhpur) percentage points after one year. AP reported a 70 percentage points reduction in anemia prevalence after 2 years. The decrease in anemia prevalence was seen in both NSGG and SGG programmes (**Figure 2**).

There was a rise in mean Hb levels reported for programmes targeting both SGG and NSGG (**Figure 3**). At baseline the mean Hb reported ranged from 8.5 to 11.1g/dl. The greatest increase was seen in one of the UP programmes which reported an increase in mean Hb from 8.5 g/dl to 11.25 g/dl. After two years of implementation, AP reported an increase in mean Hb from 11.1 gm/dl to 12.6 gm/dl.

Prevalence of severe anemia (Hb<7.0 g/dL) decreased in all programmes except in MP.

Prevalence of moderate anemia (7.0-9.9 g Hb/dL) also decreased in all programmes, and prevalence of mild anemia (10.0-11.9 g Hb/dL) increased in the majority of programmes as would be expected when the Hb distribution curve shifts to the right as the frequency and severity of anemia decrease. Serum ferritin levels were analyzed in the Gujarat evaluation only, where the prevalence of iron deficiency (<12 ng/ml) decreased significantly from 50% to 41% ($p < 0.0001$).

Compliance was assessed using the recall method and revealed that at least 85% of girls consumed at least 75% of the tablets except in Jharkhand and West Bengal where about 60% of girls consumed at least 75% of the required tablets (**Figure 4**).

The programmes that cost the most had the most impact in terms of decreasing anemia prevalence and were in the initial phases of implementation (studies or 1st phase). These programmes also targeted the least number of girls and had an established support unit for monitoring and implementation. The average annual cost for the more mature programmes was INR 25 or US \$0.58 per girl.

IMPLICATIONS

The information summarized in this review provides evidence that weekly iron/folate supplementation to adolescent girls is effective and efficient. The effectiveness of the programme supports the replication of this model in other areas where the problem exists.

ACKNOWLEDGEMENTS

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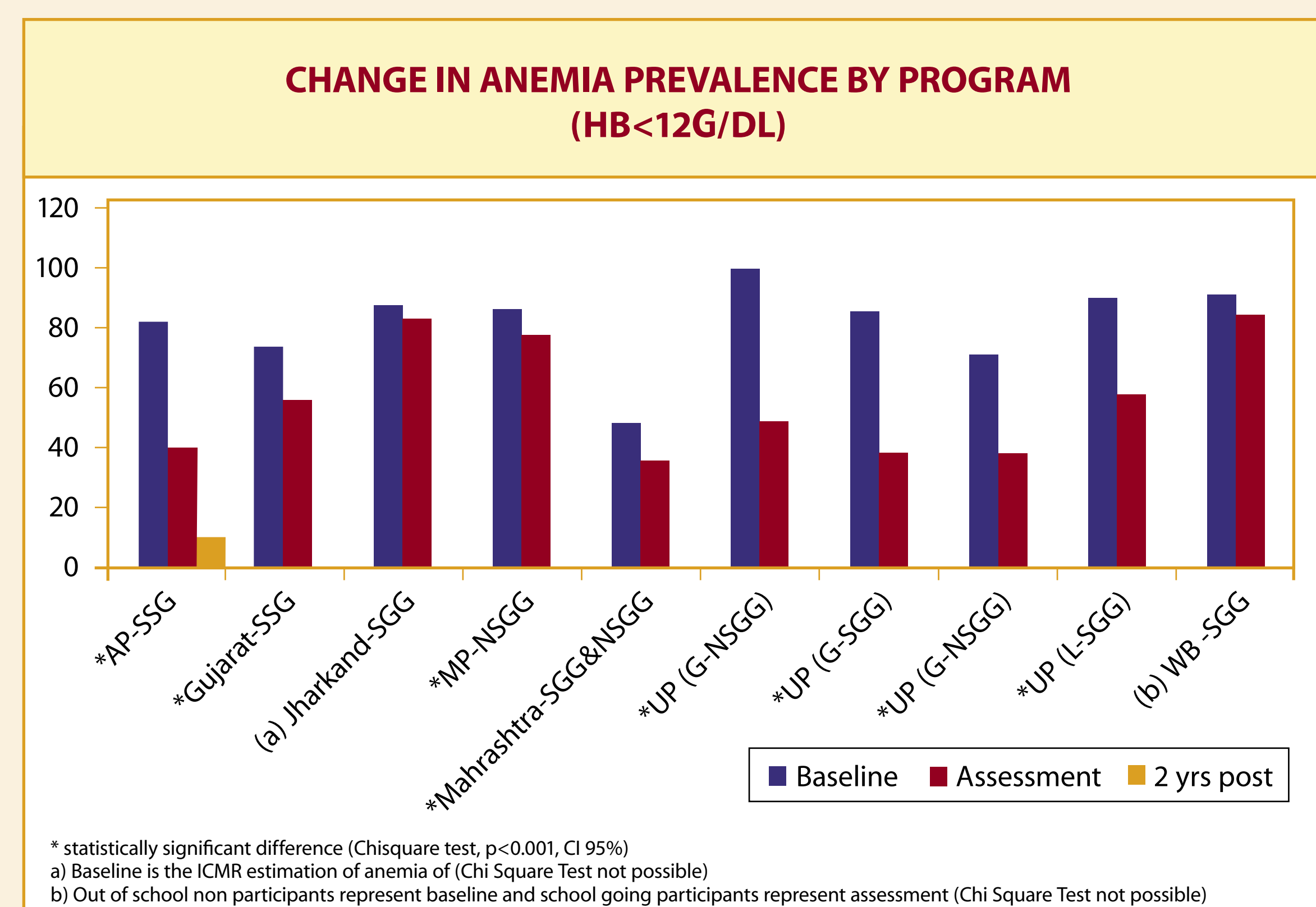


Fig. 1

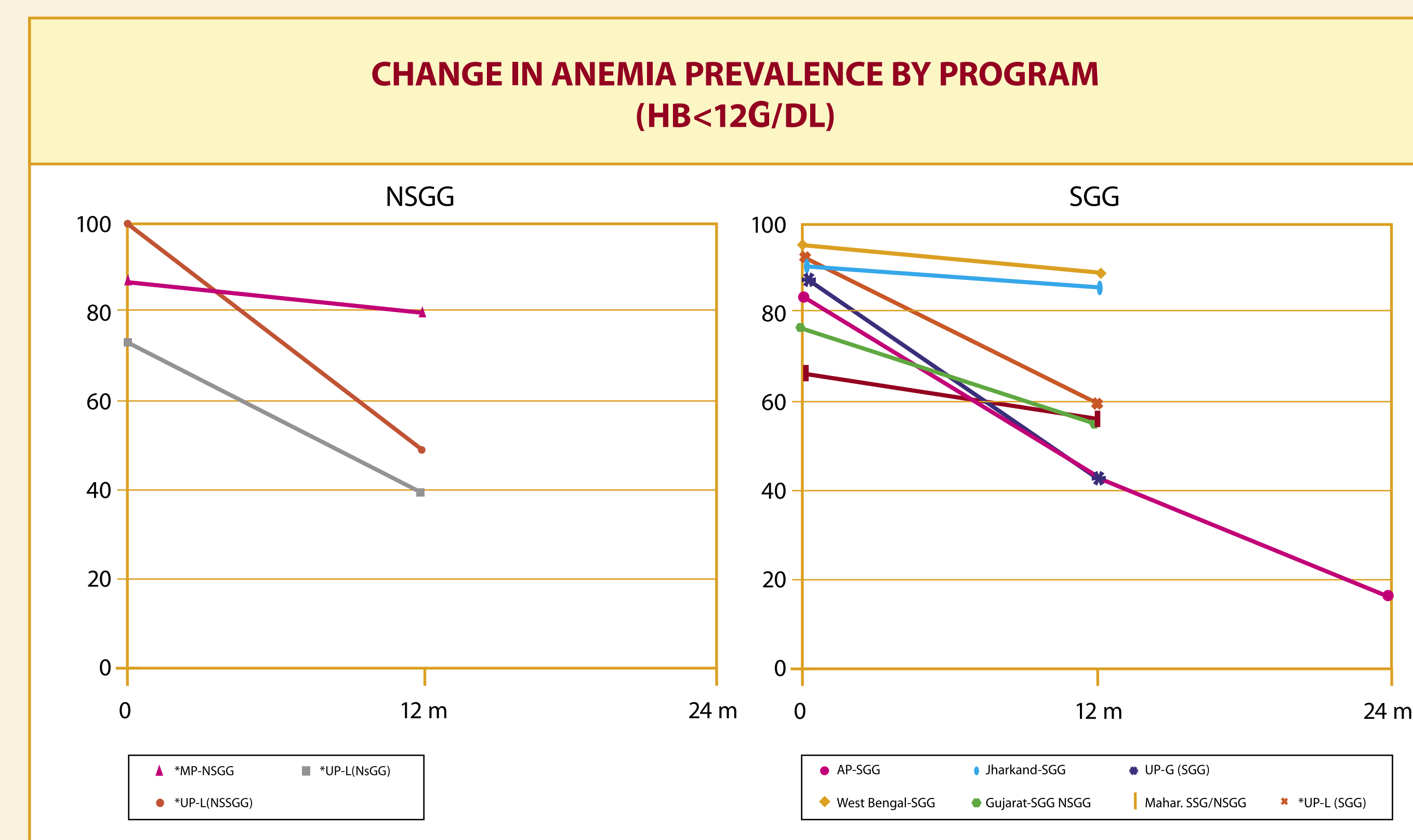


Fig. 2

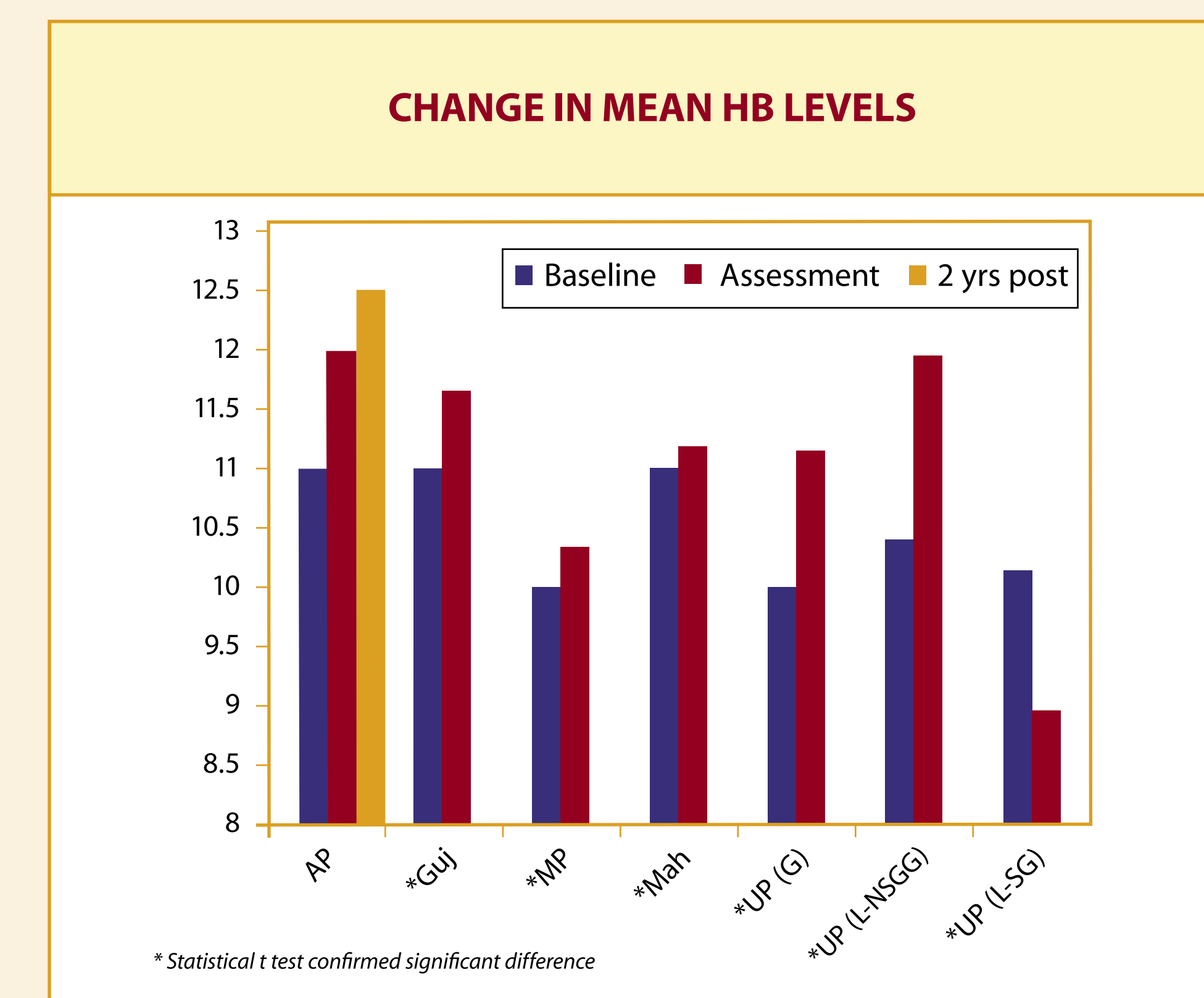


Fig. 3

| Programme Target | Cost per girl targeted in a year (INR) | Cost per girl targeted in a year (USD) | Reduction in anemia prevalence (percentage points) | Compliance (>75% of tablets) | Prevalence of anemia at of baseline |
|--|--|--|--|------------------------------|-------------------------------------|
| Studies or 1st phase of programmes, less number of girls targeted | | | | | |
| *Uttar Pradesh (Lucknow) | 140.44 | 3.19 | 34.7% (SGG) 34.3% (NSGG) | 96% | 92.6% 73.3% |
| Andhra Pradesh | 128.62 | 2.92 | 40.8% (1 yr) 69.9% (2 yrs) | 86% | 82.8% 48.4% |
| *Uttar Pradesh (Gorakhpur) | 95.92 | 2.18 | 47.1% (SGG) 50.0% (NSGG) | 96% | 87.3% 99.4% |
| More mature programmes, and greater number of girls targeted | | | | | |
| West Bengal | 38.12 | 0.87 | 6% | 64% | Proxy |
| Jharkhand | 32.35 | 0.74 | 5% | 63% | Proxy |
| Maharashtra | 25.55 | 0.68 | 10.5% | 90% | 65.2% |
| Madhya Pradesh | 14.70 | 0.33 | 7.4% | 93% | 87.8% |
| Gujarat | 12.26 | 0.28 | 20.8% | 89% | 74.1% |

Fig. 4