### SUPPLEMENTAL TABLE 1

#### Mean hemoglobin levels for non-pregnant and pregnant women by state in 1998/9 and 2005/6

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Footnotes to Supplemental Table 1

Survey sample weights applied to obtain mean hemoglobin levels and 95% CI (LCI, UCI)

Hemoglobin measured in g/dL

Changes in states over time:
  Madhya Pradesh in 1998/9 and Madhya Pradesh & Chhattisgarh (C) in 2005/6;
  Uttar Pradesh in 1998/9 and Uttar Pradesh & Uttarakhand [Uttaranchal] (U) in 2005/6
  Bihar in 1998/9 and Bihar and Jharkhand (J) in 2005/6
## Supplemental Table 2: Correlates of anaemia status for ever-married women

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<td>95% CI</td>
<td>95% CI</td>
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<td>0.95** (0.926 , 0.981)</td>
<td>0.95** (0.933 , 0.973)</td>
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<td>0.91** (0.892 , 0.933)</td>
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<td>0.89** (0.867 , 0.909)</td>
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<td>0.89** (0.863 , 0.923)</td>
<td>0.90** (0.878 , 0.923)</td>
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<td>0.89** (0.861 , 0.927)</td>
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<td>&lt;0.001</td>
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<td>1.18** (1.144 , 1.221)</td>
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<td>0.95** (0.930 , 0.972)</td>
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<td>0.92** (0.903 , 0.935)</td>
<td>0.91** (0.902 , 0.926)</td>
</tr>
<tr>
<td>other</td>
<td>0.98</td>
<td>(0.950 , 1.001)</td>
<td>0.98</td>
</tr>
<tr>
<td>Drinks alcohol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.95* (0.902 , 0.992)</td>
<td>0.99</td>
<td>(0.952 , 1.029)</td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Vegetarian</td>
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<td></td>
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<td>Yes</td>
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<td>(0.958 , 1.003)</td>
<td>0.99</td>
</tr>
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<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
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<tr>
<td>Survey year</td>
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<tr>
<td>1998/9</td>
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<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>2005/6</td>
<td>1.10** (1.087 , 1.119)</td>
<td>1.10** (1.087 , 1.119)</td>
<td>1.10** (1.087 , 1.119)</td>
</tr>
</tbody>
</table>
Footnotes to Supplemental Table 2

1 Adjusted prevalence ratios (PR) from multivariable modified Poisson regression models with any anaemia as the outcome, adjusted for covariates listed.

2 From a variable representing the ordinal categories of the predictor introduced into the model as continuous.

Pooled includes both 1998/9 and 2005/6 surveys, with a dummy variable introduced for survey year.

** p<0.01, * p<0.05
### Supplemental Table 3. Unadjusted trends in relative and absolute differences in anaemia prevalence over time

#### Wealth

<table>
<thead>
<tr>
<th></th>
<th>Anaemia prevalence (%)</th>
<th>RR</th>
<th>RD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poorest</td>
<td>Richest</td>
<td></td>
</tr>
<tr>
<td>1998/9</td>
<td>61.3</td>
<td>40.1</td>
<td>1.53</td>
</tr>
<tr>
<td>2005/6</td>
<td>63.0</td>
<td>44.1</td>
<td>1.43</td>
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Relative change

<p>| | | |</p>
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</thead>
<tbody>
<tr>
<td>0.03</td>
<td>0.10</td>
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</table>

Absolute change

<p>| | | |</p>
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<tr>
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<tbody>
<tr>
<td>1.70</td>
<td>4.00</td>
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</table>

*Trend* -0.19 -0.11

#### Education

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<th>Anaemia prevalence (%)</th>
<th>RR</th>
<th>RD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>≥13y</td>
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<tr>
<td>1998/9</td>
<td>55.4</td>
<td>36.9</td>
<td>1.50</td>
</tr>
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<td>2005/6</td>
<td>60.1</td>
<td>43.0</td>
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Relative change

<p>| | | |</p>
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</thead>
<tbody>
<tr>
<td>0.08</td>
<td>0.17</td>
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Absolute change

<p>| | | |</p>
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<tbody>
<tr>
<td>4.69</td>
<td>6.09</td>
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</table>

*Trend* -0.21 -0.08

#### Caste

<table>
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<th>Anaemia prevalence (%)</th>
<th>RR</th>
<th>RD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ST</td>
<td>General</td>
<td></td>
</tr>
<tr>
<td>1998/9</td>
<td>65.0</td>
<td>46.9</td>
<td>1.4</td>
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<td>2005/6</td>
<td>69.1</td>
<td>51.9</td>
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Relative change

<p>| | | |</p>
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</thead>
<tbody>
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<td>0.06</td>
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Absolute change

<p>| | | |</p>
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</thead>
<tbody>
<tr>
<td>4.18</td>
<td>4.94</td>
<td></td>
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</table>

*Trend* -0.13 -0.04
Footnotes to Supplemental Table 3

Comparison groups:
   Wealth: poorest quintile vs richest quintile (reference group)
   Education: no education vs ≥ 13 years of education (reference group)
   Caste: ST vs general (reference group)

RR = rate ratio (e.g. Anaemia poor ÷ Anaemia rich); Relative change (e.g. (Anaemia poor, 2005 - Anaemia poor, 1998) ÷ Anaemia poor, 1998);

RD= rate difference (e.g., Anaemia poor - Anaemia rich); Absolute change (e.g. Anaemia poor, 2005 - Anaemia poor, 1998);

Supplemental Table 4. Pooled interaction models of anaemia status for ever-married women in India

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
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<tr>
<td></td>
<td>Adjusted PR 1</td>
<td>Adjusted PR 1</td>
<td>Adjusted PR 1</td>
<td>Adjusted PR 1</td>
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<tr>
<td></td>
<td>95% CI</td>
<td>95% CI</td>
<td>95% CI</td>
<td>95% CI</td>
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<tr>
<td>Wealth Index</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>richest</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>richer</td>
<td>1.05** (1.015 - 1.076)</td>
<td>1.05** (1.025 - 1.066)</td>
<td>1.05** (1.027 - 1.069)</td>
<td>1.03* (1.005 - 1.065)</td>
</tr>
<tr>
<td>middle</td>
<td>1.08** (1.050 - 1.113)</td>
<td>1.07** (1.046 - 1.091)</td>
<td>1.07** (1.048 - 1.093)</td>
<td>1.07** (1.035 - 1.098)</td>
</tr>
<tr>
<td>poorer</td>
<td>1.13** (1.098 - 1.172)</td>
<td>1.11** (1.082 - 1.134)</td>
<td>1.11** (1.083 - 1.135)</td>
<td>1.12** (1.080 - 1.154)</td>
</tr>
<tr>
<td>poorest</td>
<td>1.22** (1.178 - 1.254)</td>
<td>1.16** (1.136 - 1.195)</td>
<td>1.16** (1.136 - 1.195)</td>
<td>1.19** (1.154 - 1.234)</td>
</tr>
<tr>
<td>Education</td>
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<td></td>
</tr>
<tr>
<td>&gt;=13</td>
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<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>11-12</td>
<td>1.02 (0.985 - 1.053)</td>
<td>1.04 (0.979 - 1.099)</td>
<td>1.02 (0.984 - 1.052)</td>
<td>1.04 (0.978 - 1.098)</td>
</tr>
<tr>
<td>6-10</td>
<td>1.07** (1.042 - 1.101)</td>
<td>1.10** (1.054 - 1.157)</td>
<td>1.07** (1.038 - 1.096)</td>
<td>1.10** (1.050 - 1.151)</td>
</tr>
<tr>
<td>1-5</td>
<td>1.09** (1.055 - 1.119)</td>
<td>1.14** (1.089 - 1.201)</td>
<td>1.08** (1.049 - 1.113)</td>
<td>1.13** (1.078 - 1.188)</td>
</tr>
<tr>
<td>none</td>
<td>1.08** (1.052 - 1.117)</td>
<td>1.14** (1.090 - 1.201)</td>
<td>1.08** (1.048 - 1.113)</td>
<td>1.12** (1.067 - 1.176)</td>
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<td>Caste</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>General</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>SC</td>
<td>1.03** (1.011 - 1.044)</td>
<td>1.03** (1.011 - 1.046)</td>
<td>1.05** (1.024 - 1.076)</td>
<td>1.04** (1.012 - 1.065)</td>
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<tr>
<td>ST</td>
<td>1.14** (1.110 - 1.163)</td>
<td>1.14** (1.111 - 1.164)</td>
<td>1.19** (1.149 - 1.224)</td>
<td>1.17** (1.133 - 1.209)</td>
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<tr>
<td>OBC</td>
<td>1.00 (0.985 - 1.015)</td>
<td>1.00 (0.986 - 1.015)</td>
<td>1.01 (0.989 - 1.031)</td>
<td>1.00 (0.982 - 1.024)</td>
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<td>Other/missing</td>
<td>0.99 (0.947 - 1.025)</td>
<td>0.99 (0.950 - 1.028)</td>
<td>1.11* (1.015 - 1.213)</td>
<td>1.09 (0.999 - 1.195)</td>
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<tr>
<td>Wealth Index*2005</td>
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<tr>
<td>richest*survey</td>
<td>1.00</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>richer*survey</td>
<td>1.00 (0.964 - 1.042)</td>
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<td></td>
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<tr>
<td>middle*survey</td>
<td>0.98 (0.940 - 1.016)</td>
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<tr>
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<td>0.95* (0.916 - 0.992)</td>
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<tr>
<td>poorest*survey</td>
<td>0.92** (0.886 - 0.955)</td>
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<td>1.00</td>
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<tr>
<td>11-12*survey</td>
<td>0.97 (0.907 - 1.044)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>6-10*survey</td>
<td>0.95 (0.900 - 1.008)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1-5*survey</td>
<td>0.92** (0.862 - 0.972)</td>
<td></td>
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<tr>
<td>none*survey</td>
<td>0.91** (0.863 - 0.968)</td>
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<tr>
<td>General*survey</td>
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<tr>
<td>SC*survey</td>
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<tr>
<td>ST*survey</td>
<td>0.96* (0.932 - 0.994)</td>
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<tr>
<td>OBC*survey</td>
<td>0.98 (0.954 - 1.009)</td>
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<tr>
<td>Other/missing*survey</td>
<td>0.87** (0.784 - 0.956)</td>
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<tr>
<td>Survey year</td>
<td></td>
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<td></td>
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<tr>
<td>1998/9</td>
<td>1.00</td>
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</tr>
<tr>
<td>2005/6</td>
<td>1.14** (1.108 - 1.182)</td>
<td>1.19** (1.122 - 1.254)</td>
<td>1.13** (1.108 - 1.157)</td>
<td>1.19** (1.123 - 1.261)</td>
</tr>
</tbody>
</table>

Wald test for interaction

- Model 1: p < 0.001
- Model 2: p = 0.0013
- Model 3: p = 0.0001
- Model 4: p < 0.001
Footnotes to Supplemental Table 4

** p<0.01, * p<0.05

1 Adjusted prevalence ratios (PR) from multivariable modified Poisson regression models with any anaemia as the outcome, adjusted for age, parity, religion, residence, occupation, contraceptive use, BMI, alcohol use, vegetarianism; clustered standard errors and state fixed effects.

2 Models include interactions terms between the year of survey and socioeconomic variable of interest
   Model 1: wealth*survey year
   Model 2: education*survey year
   Model 3: caste*survey year
   Model 4: wealth*survey year + education*survey year + caste*survey year

3 Wald test for interaction with p value and degrees of freedom.
Supplemental Table 5: Adjusted haemoglobin levels by socioeconomic correlates among non-pregnant women ever-married women aged 15-49y in 1998/9 and 2005/6

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<th>2005/6</th>
<th>POOLED</th>
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<tr>
<td></td>
<td>n=73500</td>
<td>n=80117</td>
<td>n=153617</td>
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</tr>
<tr>
<td>richest</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>richest</td>
<td>-0.066** (-0.109 , -0.022)</td>
<td>-0.072** (-0.114 , -0.030)</td>
<td>-0.070** (-0.100 , -0.040)</td>
</tr>
<tr>
<td>middle</td>
<td>-0.118** (-0.169 , -0.067)</td>
<td>-0.109** (-0.157 , -0.062)</td>
<td>-0.116** (-0.151 , -0.081)</td>
</tr>
<tr>
<td>poorer</td>
<td>-0.189** (-0.246 , -0.131)</td>
<td>-0.168** (-0.222 , -0.114)</td>
<td>-0.181** (-0.220 , -0.141)</td>
</tr>
<tr>
<td>poorest</td>
<td>-0.349** (-0.417 , -0.282)</td>
<td>-0.253** (-0.316 , -0.190)</td>
<td>-0.300** (-0.346 , -0.254)</td>
</tr>
<tr>
<td>P for trend</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
</tr>
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<td>Education in y</td>
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</tr>
<tr>
<td>&gt;=13</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>11-12</td>
<td>-0.038 (-0.118 , 0.041)</td>
<td>0.005 (-0.054 , 0.064)</td>
<td>-0.008 (-0.055 , 0.040)</td>
</tr>
<tr>
<td>6-10</td>
<td>-0.104** (-0.163 , -0.045)</td>
<td>-0.103** (-0.154 , -0.053)</td>
<td>-0.098** (-0.136 , -0.059)</td>
</tr>
<tr>
<td>1-5</td>
<td>-0.164** (-0.235 , -0.092)</td>
<td>-0.119** (-0.179 , -0.060)</td>
<td>-0.130** (-0.175 , -0.084)</td>
</tr>
<tr>
<td>none</td>
<td>-0.163** (-0.231 , -0.094)</td>
<td>-0.108** (-0.168 , -0.048)</td>
<td>-0.126** (-0.172 , -0.081)</td>
</tr>
<tr>
<td>P for trend</td>
<td>&lt;0.0001</td>
<td>0.001</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Caste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>SC</td>
<td>-0.033 (-0.082 , 0.017)</td>
<td>-0.069** (-0.114 , -0.024)</td>
<td>-0.055** (-0.088 , -0.022)</td>
</tr>
<tr>
<td>ST</td>
<td>-0.260** (-0.339 , -0.181)</td>
<td>-0.269** (-0.338 , -0.200)</td>
<td>-0.267** (-0.320 , -0.215)</td>
</tr>
<tr>
<td>OBC</td>
<td>0.011 (-0.028 , 0.051)</td>
<td>0.008 (-0.030 , 0.046)</td>
<td>0.006 (-0.021 , 0.034)</td>
</tr>
<tr>
<td>Other/missing</td>
<td>-0.223* (-0.411 , -0.035)</td>
<td>0.042 (-0.040 , 0.124)</td>
<td>0.025 (-0.049 , 0.098)</td>
</tr>
<tr>
<td>Survey year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998/9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005/6</td>
<td></td>
<td></td>
<td>-0.198** (-0.227 , -0.168)</td>
</tr>
</tbody>
</table>

** p<0.01, * p<0.05

Restricted to non-pregnant women only

From adjusted multilevel linear regression models controlling for age, parity, wealth, education, caste and rural/urban residence; clustered standard errors and state fixed effects.
Intercept = 15-19y, no children, Hindu, general caste, richest quintile, >= 13yrs education, no alcohol, normal BMI, not using contraception, not working, residing in a rural area, living in Uttar Pradesh.
P for trend from a variable representing the ordinal categories of the predictor introduced into the model as continuous.
### Supplemental Table 6. Summary of historical policies and programs directly addressing anaemia in India

<table>
<thead>
<tr>
<th>YEAR</th>
<th>POLICY/PROGRAM</th>
<th>NOTES</th>
<th>REFERENCES</th>
</tr>
</thead>
</table>
| 1970 | Nutritional Anaemia Prophylaxis Programme (NAPP) |  - All states  
- Pregnant and lactating women  
- pre-school children (1-5 years of age)  
- IFA provision to high risk groups (Hb <10gm% for women, and Hb <10gm% for children)  
- [100 tablets of dose 60mg of elemental iron and 500μg folic acid for women, and 20mg of elemental iron and 100μg folic acid for children]  
| 1990 | National Nutritional Anaemia Control Programme (NNACP) |  - All states  
- Both anaemic and non-anaemic  
- Pregnant and lactating women; IUD users  
- [100 tablets of dose 100mg of elemental iron and 500μg folic acid for women and 20mg of elemental iron and 100μg folic acid for preschool children]  
- Strategies include the :  
  - “promotion of regular consumption of foods rich in iron”  
  - “provision of iron and folate supplements in the form of tablets (folifer tablets) to the “high risk” groups”  
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Details</th>
<th>Source</th>
</tr>
</thead>
</table>
| 1993   | National Nutrition Policy                                           | - Iron deficiency noted as one of the “major nutrition problems of India”  
- “The Nutritional Anaemia Prophylaxis Programme should be extended and strengthened to reduce anaemia to reduce anaemia in expectant women to 25% by 2000 A.D”  
- Called for improved control of MND among vulnerable groups through intensified programmes  
- Iron supplementation to adolescent girls (delivered through ICDS)                                                                                           | National Nutrition Policy, 1993, GOI, Available at: wcd.nic.in/nnp.pdf                           |
| 1995   | National Plan of Action on Nutrition (NPAN)                          | - Implementing plan of National Nutrition Policy, with specific intervention programmes to address nutrition [included those for micronutrient deficiencies & anaemia]                                      |                                                                                                  |
| 1997   | Reproductive and Child Health (RCH) programme                       | - Nutritional anaemia control emphasized                                                                                                                                                    |                                                                                                  |
| 1997/8 | National Consultation on Control of Nutritional Anaemia in India     | - Also added children in the 6 - 24 month age group for intervention (IFA supplementation).  
- Notes again the importance of assuring basic nutrition needs (Protein-energy AND micronutrients) for hemopoiesis                                                                 |                                                                                                  |
| 2002   | The Tenth Five Year Plan (2002-2007)                                | - Goals are screening of children for anaemia wherever required, with appropriate treatment of anaemic individuals  
- universal screening of pregnant women for anaemia and appropriate treatment and reducing the prevalence of anaemic by 25% and moderate and severe anaemic by 50% in children, pregnant and lactating women and adolescents. | Planning Commission.10th Five Year Plan. Government of India. Delhi, 2002.                       |
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| 2007 | The Eleventh Five Year Plan (2007-2012) | “Eleventh Five Year Plan, for improving maternal health, special attention will be focused on the following areas:  
• Ensuring universal provision of comprehensive ANC  
• Providing widespread screening for anaemia and high-risk conditions”  

| | | “3.1.119 …Every effort will be made to operationalize the strategy for prevention and management of anaemia during the Eleventh Five Year Plan so that the target of reducing anaemia among women and girls by 50% is achieved by the end of 2012.”  
| | | “4.1.69 …Reducing anaemia among pregnant women and children to under 10%. There should also be a regular measurement of the status of anaemia among women and children.”  
| | | “4.1.79 The current strategy, included as part of RCH Programme under NRHM, recommends that pregnant and lactating women, 6–12 months infants, school children, 6–10 year olds, and adolescents (11–18 year old) should be targeted in the NAPP as per the recommended dosage.” |
Supplemental Figure 1. Relative and absolute changes in state prevalence of anaemia between 1998/9 and 2005/6 NFHS surveys

**Relative change in anemia prevalence over time**

**Absolute change in anemia prevalence over time**
Footnotes to Supplemental Figure 1

Survey sample weights applied to obtain weighted percentages and 95% CI


Relative risk and 95% CI estimated from modified Poisson regression models, adjusting for age, parity, wealth, education, caste and rural/urban residence

Absolute difference and 95% CI estimated from linear regression models, adjusting for age, parity, wealth, education, caste and rural/urban residence.