**Prevalence of Vitamin B12 and Folate Deficiencies in Indian Children and Adolescents**

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**Running title:** Vitamin B12 and folate status in Indian children and adolescents

**Supplementary Table 1.** Comparison of characteristics of the study (vitamin B12 and folate) sample with the total survey sample

|  |  |  |  |
| --- | --- | --- | --- |
| Characteristics | 1-4 years | 5-9 years | 10-19 years |
| Vitamin B12% (95% CI) | Folate% (95% CI) | CNNS total% (95% CI) | Vitamin B12% (95% CI) | Folate% (95% CI) | CNNS total% (95% CI) | Vitamin B12% (95% CI) | Folate% (95% CI) | CNNS total% (95% CI) |
| Age | 1-2 years | 38.6(36.4-40.9) | 38.7(36.7-40.7) | 48.6(47.5-49.6) | 5-6 years: 39.7 (38.0-41.4) | 38.8(37.3-40.3) | 40.4(39.4-41.4) | 10-14 years: 52.8 (51.4-54.3) | 52.6(51.3-53.9) | 51.8(51.2-52.5) |
| 3-4 years | 61.4(59.1-63.6) | 61.3(59.3-63.3) | 51.4(50.4-52.5) | 7-9 years: 60.3 (58.6-62.0) | 61.2(59.7-62.7) | 59.6(58.6-60.6) | 15-19 years: 47.2 (45.7-48.6) | 47.4(46.1-48.7) | 48.2(47.5-48.8) |
| Sex | Boys  | 52.9(50.3-55.4) | 52.5(50.0-55.0) | 51.4(50.3-52.6) | 51.6(49.8-53.3) | 51.2(49.4-52.9) | 50.4(49.4-51.4) | 50.6(48.6-52.5) | 50.6(48.8-52.4) | 49.9(48.8-50.9) |
| Girls  | 47.1(44.6-49.7) | 47.5(45.0-50.0) | 48.6(47.4-49.7) | 48.4(46.7-50.2) | 48.8(47.1-50.6) | 49.6(48.6-50.6) | 49.4(47.5-51.4) | 49.4(47.6-51.2) | 50.1(49.1-51.2) |
| Residence   | Urban | 24.9(21.7-28.4) | 25.7(22.5-29.1) | 23.8(21.4-26.3) | 23.6(20.7-26.8) | 25.1(22.1-28.2) | 24.2(21.8-26.8) | 25.2(22.1-28.6) | 25.7(22.6-29.0) | 24.7(22.3-27.4) |
| Rural | 75.1(71.6-78.3) | 74.3(70.9-77.5) | 76.2(73.7-78.6) | 76.4(73.2-79.3) | 74.9(71.8-77.9) | 75.8(73·2-78·2) | 74.8(71.4-77.9) | 74.3(71.0-77.4) | 75.3(72.6-77.7) |
| Mothers' Schooling | Primary | 34.3(31.7-36.9) | 34.6(31.9-37.3) | 37.8(35.9-39.9) | 47.8(45.4-50.3) | 47.9(45.6-50.3) | 49.3(47.4-51.2) | 16.3(14.3-18.4) | 15.9(14.1-18.0) | 14.6(13.5-15.9) |
| Secondary | 44.3(41.8-46.8) | 43.6(41.3-46.0) | 41.8(40.3-43.3) | 40.1(38.0-42.3) | 39.8(37.8-41.8) | 37.9(36.5-39.3) | 68.7(66.2-71.1) | 69.3(67.0-71.5) | 69.1(67.7-70.4) |
| Higher Secondary | 10.8(9.3-12.5) | 11.4(9.9-13.1) | 10.0(9.2-10.9) | 6.7(6.0-7.6) | 6.9(6.2-7.8) | 6.7(6.2-7.3) | 9.7(7.7-12.1) | 9.5(7.7-11.6) | 9.1(8.4-9.9) |
| Graduation & above | 10.7(9.2-12.4) | 10.4(9.0-12.0) | 10.3(9.5-11.2) | 5.3(4.7-6.1) | 5.4(4.8-6.1) | 6.1(5.5-6.6) | 5.3(4.4-6.3) | 5.3(4.5-6.3) | 7.2(6.5-8.0) |
| Wealth Index | Poorest | 15.9(13.8-18.3) | 15.8(13.7-18.1) | 20.3(18.1-22.6) | 18.1(16.2-20.3) | 18.0(15.8-20.4) | 20.0(18.0-22.2) | 17.8(15.5-20.4) | 18.3(16.0-20.8) | 20.0(17.9-22.3) |
| Poor | 21.2(18.5-24.1) | 20.5(17.9-23.4) | 19.4(18.1-20.8) | 21.3(19.4-23.3) | 20.2(18.5-21.9) | 20.0(18.6-21.4) | 20.5(18.8-22.3) | 20.6(18.9-22.3) | 20.0(18.8-21.2) |
| Middle | 22.3(20.4-24.3) | 21.7(19.9-23.5) | 20.2(19.0-21.4) | 21.5(19.9-23.3) | 21.0(19.4-22.5) | 20.0(18.9-21.2) | 21.4(19.8-23.1) | 20.3(18.8-21.9) | 20.0(18.9-21.1) |
| Rich | 20.8(18.9-22.9) | 21.7(19.7-23.9) | 20.0(18.8-21.2) | 21.0(19.4-22.7) | 21.6(19.9-23.3) | 20.0(18.8-21.3) | 20.9(19.3-22.7) | 21.0(19.4-22.8) | 20.0(18.8-21.2) |
| Richest | 19.8(17.7-22.0) | 20.3(18.3-22.5) | 20.1(18.7-21.6) | 18.0(16.4-19.8) | 19.3(17.6-21.1) | 20.0(18.5-21.6) | 19.3(17.5-21.2) | 19.8(17.9-21.8) | 20.0(18.6-21.5) |

**Supplementary Table 2.** Prevalence of vitamin B12 and folate deficiency in children and adolescents by socio-demographic and WASH variables

|  |  |  |  |
| --- | --- | --- | --- |
| Characteristics | 1-4 years | 5-9 years | 10-19 years |
| Vitamin B12 deficiency% (95% CI) | Folatedeficiency% (95% CI) | Vitamin B12 deficiency% (95% CI) | Folatedeficiency% (95% CI) | Vitamin B12 deficiency% (95% CI) | Folatedeficiency% (95% CI) |
| Residence | Urban | 14.4a(9.9-20.4) | 23.5a(20.5-26.8) | 15.7a(11.9-20.4) | 31.1a(27.4-35.0) | 30.5a(27.1-34.0) | 40.9a(35.6-46.3) |
| Rural | 13.6a(11.4-16.3) | 22.5a(19.5-25.7) | 17.8a(15.7-20.1) | 26.5a(23.7-29.5) | 31.2a(28.2-34.3) | 33.8a(30.7-37.1) |
| Currently in school | Yes |  | - | 17.4a(15.5-19.4) | 28.1a(25.8-30.5) | 31.1a(28.3-33.9) | 36.7a(34.0-39.4) |
| No | - | - | 16.1a(11.7-21.9) | 22.5a(17.9-27.9) | 30.9a(26.5-35.6) | 33.4a(29.4-37.8) |
| Mother’s Schooling | Primary  | 16.4a(12.7-20.9) | 25.2a(21.4-29.5) | 20.4a(17.7-23.5) | 25.2a(22.3-28.4) | 26.6a(20.3-34.0) | 38.8a(33.0-44.9) |
| Secondary  | 12.5ab(10.6-14.7) | 23.9a(21.1-26.9) | 14.1b(12.2-16.2) | 30.4a(27.5-33.4) | 30.8a(27.8-34.1) | 41.5a(38.3-44.7) |
| Higher secondary | 8.3b(5.9-11.5) | 16.2b(12.9-20.2) | 17.1ab(13.0-22.2) | 32.5ab(27.3-38.0) | 30.0a(20.2-42.2) | 41.9a(31.0-53.6) |
| Graduate and above | 16.9ab(7.9-32.4) | 16.9ab(12.6-22.3) | 14.4ab(9.0-22.3) | 23.4ab(19.5-27.8) | 28.4a(22.4-35.3) | 34.4a(27.8-41.6) |
| Father’s Occupation | Professional | 11.6a(8.1-16.3) | 17.0a(13.1-21.8) | 17.7a(13.6-22.9) | 21.1a(17.1-25.7) | 37.1a(28.6-46.5) | 23.1a(18.7-28.1) |
| Sales and services | 11.5a(8.9-14.8) | 22.3ab(19.6-25.3) | 14.7a(11.8-18.3) | 30.4b(27.4-33.6) | 27.9a(24.6-31.4) | 39.5b(35.9-43.1) |
| Manual, Agriculture | 13.8a(11.6-16.3) | 25.7b(22.3-29.4) | 17.5a(15.3-20.0) | 30.0b(27.0-33.1) | 31.2a(28.5-34.0) | 39.3b(36.0-42.7) |
| Others | 20.0a(11.7-31.9) | 16.5ac(12.1-22.0) | 20.7a(15.5-27.2) | 17.1ac(13.4-21.5) | 31.7a(26.7-37.1) | 23.6ac(19.4-28.3) |
| Wealth Index | Poorest | 13.8a(10.2-18.4) | 19.9a(14.9-26.1) | 22.2a(17.8-27.3) | 20.7a(15.4-27.1) | 30.7a(25.0-37.0) | 27.0a(21.6-33.2) |
| Poor | 15.0a(10.1-21.6) | 23.3a(18.2-29.2) | 14.7a(11.7-18.4) | 23.5a(20.0-27.4) | 28.0a(23.2-33.3) | 32.0ab(27.8-36.6) |
| Middle | 13.9a(10.3-18.5) | 25.1a(21.3-29.3) | 18.0a(14.8-21.6) | 29.6ab(26.0-33.5) | 30.0a(25.7-34.7) | 35.9ab(32.1-39.9) |
| Rich | 13.1a(9.7-17.5) | 24.4a(21.2-28.0) | 16.8a(14.2-19.9) | 33.6b(30.4-37.0) | 33.5a(29.7-37.6) | 40.3b(36.2-44.6) |
| Richest | 13.2a(9.8-17.6) | 20.2a(17.4-23.2) | 15.0a(11.6-19.2) | 29.6ab(26.6-32.8) | 32.9a(29.2-36.9) | 42.0b(37.2-47.0) |
| Drinking water source | Piped & Improved | 13.3a(11.2-15.8) | 21.0a(18.7-23.4) | 17.4a(15.5-19.4) | 26.3a(24.0-28.6) | 31.1a(28.5-33.9) | 33.3a(30.8-36.0) |
| Non-piped & Improved | 19.7a(10.6-33.6) | 32.3b(26.4-38.8) | 17.9a(9.7-30.8) | 33.6ab(26.3-41.9) | 32.5a(28.0-37.3) | 48.0b(40.4-55.6) |
| Unimproved | 12.1a(7.9-18.1) | 35.8ab(23.0-51.0) | 15.9a(11.9-21.0) | 39.2b(30.4-48.8) | 29.6a(22.2-38.2) | 54.7b(45.7-63.5) |
| Hand washing | Basic | 13.4a(10.4-17.1) | 23.0a(20.3-25.9) | 17.2a(15.3-19.3) | 28.7a(26.3-31.3) | 32.7a(29.9-35.7) | 38.0a(35.0-41.1) |
| Limited | 14.0a(11.5-16.9) | 26.0a(22.3-29.9) | 16.3a(13.7-19.3) | 28.5ab(24.9-32.4) | 30.6a(26.6-34.8) | 36.0ab(32.2-39.9) |
| No facility | 14.7a(9.2-22.7) | 14.1b(10.6-18.5) | 20.2a(14.5-27.5) | 21.3b(17.4-25.7) | 27.0a(22.6-32.0) | 28.0b(22.7-33.9) |
| Sanitation | Improved & Not shared | 11.9a(9.3-15.0) | 24.1a(21.4-27.0) | 16.2a(13.5-19.3) | 32.2a(29.6-34.9) | 31.0a(28.5-33.7) | 39.3a(36.3-42.5) |
| Improved & Shared | 12.9a(9.5-17.3) | 19.8a(16.0-24.3) | 13.8a(10.9-17.4) | 25.8ab(22.4-29.5) | 27.2a(22.5-32.4) | 35.3ab(30.7-40.0) |
| Unimproved | 15.9a(12.8-19.6) | 22.4a(18.8-26.5) | 19.2a(16.4-22.3) | 24.4b(21.0-28.2) | 31.6a(27.7-35.8) | 31.8b(27.9-36.1) |

Superscripts abc with different letters in the same column indicate estimates with non-overlapping CI



**Supplementary Fig.1A** Association between the vitamin B12 prevalence by state across all the age groups (A) 1-4 years vs 5-9 years (B) 1-4 years vs 10-19 years and (C) 5-9 years vs 10-19 years



**Supplementary Fig.1B** Association between the folate prevalence by state across all the age groups (A) 1-4 years vs 5-9 years (B) 1-4 years vs 10-19 years and (C) 5-9 years vs 10-19 years