

**APPENDIX FOR
CHIRANJEEVI EVALUATION PAPER (MOHANAN ET AL., 2013)**

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The COHESIVE CY Survey – Sample Details

The COHESIVE CY Survey instruments and protocols are available online at <http://www.cohesiveindia.org>. The sampling procedure for the survey followed a three-stage cluster design. To identify the sampling universe of blocks and villages, government census data of 2001 was used. All districts of the state were included in the survey. First, blocks (or talukas) were sampled from from the respective districts in proportion to total number of blocks from each district). Within the 75 blocks selected, eight villages (or PSUs) were sampled with probability proportional to size. Within each village/PSU, a brief census of all households was conducted to determine 1) households that had deliveries in the past five years (since 2005) and 2) households that fall within the five points on either side of the BPL index threshold. In Gujarat, the cut-off BPL score is 20. These households formed the sampling universe from which 6,000 households were drawn from 600 villages from 75 blocks. The final participation rate was 94.4%, yielding a final sample of 5,663 households, among whom 5,597 households with complete information on all covariates were included the analytical sample. Further details on sampling, and population figures used to create the sampling frame are available on COHESIVE’s website: <http://www.cohesiveindia.org/publications-downloads.html>

BPL Scoring

The government of India issues BPL cards to households deemed poor according to an index that consists of 13 components such as ownership of various assets, literacy, household members’ occupations, migration, and child labor. Index scores range from 0 to 52. We sample households with a BPL score of 16 to 25 in 2002, based on the retrospective questions in the household census.

In the COHESIVE CY Survey, we collected information on each of the 13 components in 2002 (retrospectively) and in 2010 at the time of the survey. Based on this data, we calculated BPL scores of households in 2002.

Because we originally intended to use a “fuzzy” regression discontinuity design¹, we selected households with below-poverty-line (BPL) index scores between 16 and 25 in the year 2002 to be included in the sample.

Triple-Difference Analysis of the Impact of BPL status on CY Program Effect

The widespread manipulation of BPL status found in our analysis of BPL score suggests that although CY vouchers are distributed to BPL households, the effect of the CY program should be the similar among BPL households and non-BPL households. We confirm this by performing a linear triple-difference analysis in which we include indicators for whether the CY program was available in the district at the time of birth and whether the household holds a BPL card, along with an indicator for both the CY program and BPL card. The results of our linear triple-difference analysis are presented alongside congruent odds ratios estimated using logistic regression in Appendix Table A4. We find no significant difference in the effect of CY between BPL households and non-BPL households.

¹ Hahn, Jinyong, Petra Todd, and Wilbert Van der Klaauw. 2001. “Identification and Estimation of Treatment Effects with a Regression-Discontinuity Design.” *Econometrica* 69(1): 201- 209..

Appendix Table A-1 Odds Ratios: Effect of Chiranjeevi - Odds Ratios from Logistic Regressions and DD estimates in main paper

| | COHESIVE | | DLHS | |
|--------------------------|--|-------------------------------------|--|-------------------------------------|
| | Linear DD coefficient [Percentage Points] | Logistic Regression [Odds Ratio] | Linear DD coefficient [Percentage Points] | Logistic Regression [Odds Ratio] |
| Delivery in facility | 2.42 [-5.90 , 10.74] | 1.11 [0.74 , 1.69] | -3.08 [-9.12 , 2.96] | 0.90 [0.66 , 1.24] |
| Private (if facility) | -2.47 [-8.30 , 3.36] | 0.89 [0.67 , 1.19] | -4.39 [-12.17 , 3.39] | 0.80 [0.54 , 1.19] |
| Assisted by doctor/nurse | 3.13 [-5.31 , 11.58] | 1.16 [0.74 , 1.81] | -2.51 [-8.27 , 3.25] | 0.91 [0.67 , 1.25] |
| Normal delivery | 1.61 [-1.35 , 4.58] | 1.75 [0.74 , 4.18] | 0.12 [-3.37 , 3.60] | 1.02 [0.62 , 1.68] |
| Any complications | 6.16 [-2.63 , 14.95] | 1.31 [0.87 , 1.96] | 2.45 [-3.34 , 8.24] | 1.11 [0.87 , 1.42] |
| Became unconscious | -1.82 [-6.83 , 3.19] | 0.58 [0.20 , 1.65] | | |
| Child needed NICU | 2.12 [-3.32 , 7.55] | 1.48 [0.61 , 3.60] | | |
| Excessive Bleeding | | | 1.99 [-1.28 , 5.26] | 1.39 [0.79 , 2.43] |
| Convulsions | | | -2.17 [-4.49 , 0.14] | 0.55 [0.28 , 1.10] |
| Had ANC checkup | 3.18 [-1.69 , 8.06] | 1.26 [0.83 , 1.92] | -2.09 [-8.07 , 3.90] | 0.93 [0.67 , 1.28] |
| Doctor/nurse did ANC | -3.76 [-11.75 , 4.24] | 0.67 [0.33 , 1.37] | 0.12 [-2.89 , 3.13] | 1.03 [0.34 , 3.08] |
| ANC in facility | | | 0.80 [-3.61 , 5.20] | 1.26 [0.53 , 3.01] |
| Had PNC checkup | 4.99 [-2.15 , 12.13] | 1.47 [0.95 , 2.27] | 2.23 [-3.50 , 7.96] | 1.15 [0.87 , 1.51] |
| Doctor/nurse did PNC | 0.77 [-9.79 , 11.33] | 0.76 [0.23 , 2.55] | | |
| Any costs [^] | 2.69 [-1.10 , 6.48] | 1.95 [0.71 - 5.34] | -3.06 [-8.81 , 2.70] | 0.80 [0.55 , 1.18] |

Point estimates and 95% CI from regressions with full set of covariates; adjusted for survey design.

[^] Costs are for institutional delivery in COHESIVE, compared to all deliveries in DLHS

DD coefficients in columns 1 and 3 are percentage points for outcomes other than costs; DD coefficients in columns 1 and 3 are percentages for total cost, non-hospital cost and transportation cost; Columns 2 and 4 show odds ratios from logistic regressions. Controls for age at marriage, age at delivery, education, household wealth and religion included by not reported. Year district and caste fixed effects not shown. Sample consists of last child born since 2005. 95% confidence interval in brackets.

Appendix Table A-2: Parallel trends in years preceding CY implementation in early v/s late rollout districts

| VARIABLES | Institutional Delivery | | Private Institutional Delivery | | Attended Delivery | | Normal Delivery | | Excessive Bleeding | |
|-----------------------------|------------------------|-----------------|--------------------------------|------------------|-------------------|------------------|------------------|------------------|--------------------|-----------------|
| Years to CY | -8.83** | 0.18 | -12.42 | 2.63*** | -11.76*** | -0.07 | -1.65 | 1.91*** | 7.54*** | -0.77*** |
| | [-16.78 - -0.88] | [-0.44 - 0.81] | [-33.13 - 8.29] | [1.81 - 3.46] | [-20.45 - 3.07] | [-0.69 - 0.54] | [-6.26 - 2.95] | [1.44 - 2.37] | [2.33 - 12.75] | [-1.16 - 0.39] |
| Early Rollout District | | 11.67 | | 9.73 | | 12.46 | | -0.90 | | -10.96** |
| | | [-7.16 - 30.50] | | [-18.07 - 37.53] | | [-5.52 - 30.44] | | [-13.26 - 11.45] | | [-20.38 - 1.53] |
| Years to CY * Early Rollout | | -0.51 | | 1.03 | | -0.15 | | 0.85 | | 0.50 |
| | | [-3.70 - 2.68] | | [-2.70 - 4.76] | | [-3.14 - 2.85] | | [-1.26 - 2.96] | | [-0.93 - 1.94] |
| Constant | 35.44 | -23.80*** | 88.23*** | 43.53*** | 173.83*** | -2.52 | 151.32*** | 111.98*** | -87.98*** | 23.30*** |
| | [-66.86 - 137.74] | [-39.70 - 7.90] | [30.93 - 145.53] | [12.10 - 74.96] | [62.56 - 285.10] | [-17.24 - 12.21] | [89.39 - 213.26] | [96.15 - 127.80] | [-153.66 - 22.30] | [14.16 - 32.44] |
| Observations | 7,309 | 7,309 | 3,703 | 3,703 | 7,309 | 7,309 | 7,309 | 7,309 | 7,309 | 7,309 |
| R-squared | 0.26 | 0.26 | 0.10 | 0.10 | 0.25 | 0.25 | 0.10 | 0.10 | 0.02 | 0.02 |

Continued

| VARIABLES | Antenatal Care | | Antenatal Testing | | Tetanus | | Iron Supplements | |
|-----------------------------|------------------|------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|
| Years to CY | -7.01 | -0.38 | -1.08 | -0.15 | -1.44 | -0.10 | -0.63 | 0.20 |
| | [-16.21 - 2.19] | [-0.83 - 0.07] | [-11.19 - 9.03] | [-0.59 - 0.30] | [-9.02 - 6.15] | [-0.50 - 0.30] | [-10.12 - 8.87] | [-0.22 - 0.63] |
| Early Rollout District | | -0.01 | | -2.45 | | -1.92 | | -4.01 |
| | | [-17.89 - 17.88] | | [-19.13 - 14.22] | | [-18.17 - 14.33] | | [-22.46 - 14.44] |
| Years to CY * Early Rollout | | 1.27 | | 0.64 | | 0.62 | | 0.93 |
| | | [-1.61 - 4.14] | | [-1.85 - 3.14] | | [-1.97 - 3.22] | | [-1.93 - 3.79] |
| Constant | 128.29** | 34.67*** | 95.04* | 65.23*** | 86.79* | 64.59*** | 64.87 | 48.04*** |
| | [11.81 - 244.77] | [21.62 - 47.72] | [-16.57 - 206.66] | [52.25 - 78.20] | [-8.89 - 182.46] | [53.09 - 76.09] | [-55.55 - 185.29] | [34.15 - 61.93] |
| Observations | 7,306 | 7,306 | 6,072 | 6,072 | 7,306 | 7,306 | 7,306 | 7,306 |
| R-squared | 0.19 | 0.19 | 0.09 | 0.09 | 0.12 | 0.12 | 0.10 | 0.10 |

*** p<0.01, ** p<0.05, * p<0.10; All models control for mother's age at marriage, mother's age at delivery, mother's education, household standard of living index, religion, and caste/social group; all models include district and year fixed effects. Sample includes most recent deliveries only. Reference group is deliveries occurring 6 or more years prior to CY implementation. Adjusted for survey design, robust standard errors clustered at the district level

Appendix Table A-3 - Selection:

Difference between mothers who choose institutional delivery and those who don't

| PANEL A: <i>MATERNAL CHARACTERISTICS</i> | COHESIVE DATA | | | | | DLHS DATA | | | | |
|---|-------------------|-------------------------|-------------------------------|--------------------------------|-----------------|-------------------|--------------------|--------------------|--------------------|------------------|
| | Age at marriage | Mothers age at delivery | Mother's education [3 levels] | Monthly HHld income [5 levels] | Hindu | Age at marriage | Age at delivery | Education | Wealth Index | Hindu |
| Delivery in facility | 0.46*** (0.10) | -0.78*** (0.20) | 0.31*** (0.04) | 0.13** (0.05) | -0.01 (0.01) | 1.25*** (0.13) | -0.64** (0.21) | -0.29*** (0.02) | 0.93*** (0.04) | -0.04* (0.01) |
| CY active at delivery | 0.06 (0.07) | 0.98*** (0.18) | -0.04 (0.03) | 0.00 (0.04) | 0.00 (0.01) | -0.15 (0.11) | -0.73*** (0.20) | 0.07** (0.02) | -0.08* (0.03) | 0 (0.01) |
| Delivery in facility X CY active | -0.02 (0.09) | -0.03 (0.21) | 0.05 (0.03) | 0.00 (0.05) | 0.01 (0.01) | -0.12 (0.15) | 0.11 (0.25) | 0.01 (0.03) | -0.20*** (0.05) | 0.01 (0.02) |

| PANEL B: <i>HEALTH OUTCOMES</i> | COHESIVE DATA | | | | | DLHS DATA | | | | |
|--|--------------------------|--------------------|-------------------|--------------------|--------------------|--------------------------|---------------------|--------------------|--------------------|----------------------|
| | Assisted by doctor/nurse | Normal delivery | Child needed NICU | Had ANC checkup | Had PNC checkup | Assisted by doctor/nurse | Normal delivery | Excessive bleeding | Had ANC checkup | Received PNC checkup |
| Delivery in facility | 84.21*** (1.47) | -8.88*** (0.81) | 2.65* (1.11) | 26.53*** (2.93) | 49.63*** (3.55) | 86.47*** (1.23) | -15.83*** (1.14) | -2.51* (1.13) | 38.20*** (2.04) | 61.72*** (1.85) |
| CY active at delivery | -0.41 (1.28) | -0.04 (0.34) | 0.77 (0.95) | 6.27* (2.67) | 1.82 (2.37) | -2.1 (1.46) | -0.13 (0.34) | 0.77 (1.13) | 1.61 (2.05) | -0.09 (1.83) |
| Delivery in facility X CY active | 0.92 (1.31) | 0.17 (0.74) | 0.01 (1.25) | -6.41* (2.66) | -1.87 (2.49) | 2.1 (1.46) | 2.66 (1.38) | -0.47 (1.43) | -1.51 (2.38) | -2.78 (2.22) |

Coefficients and clustered SE in parentheses.

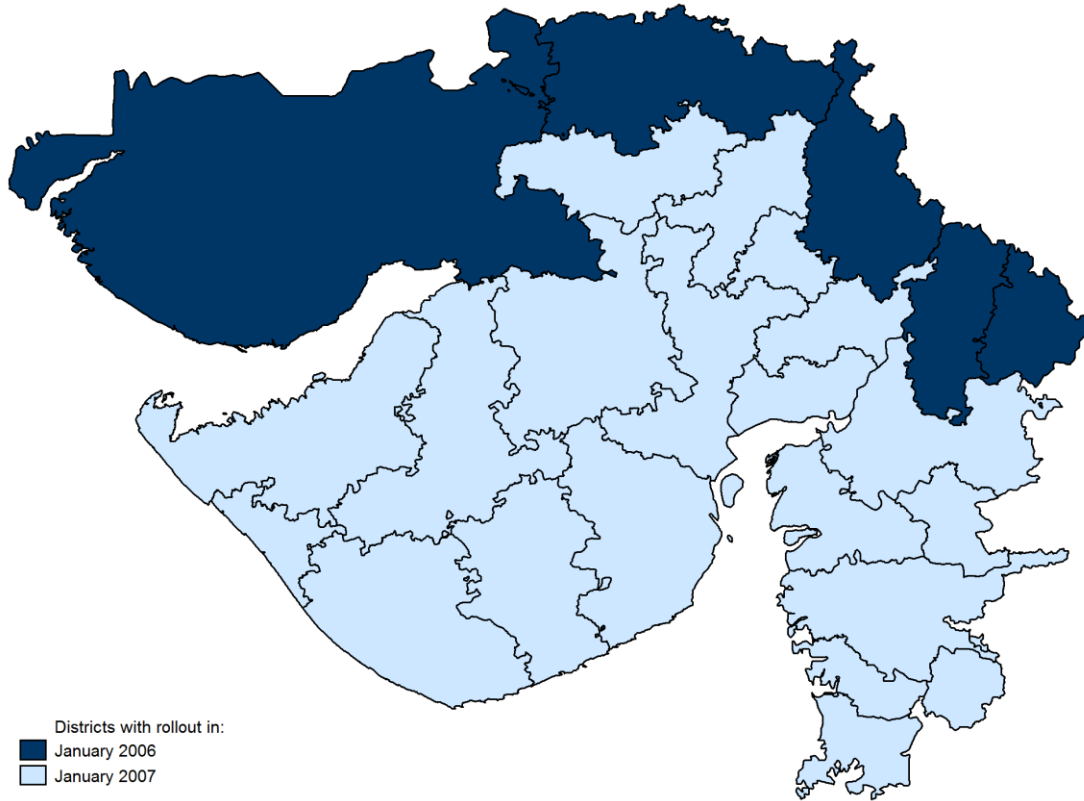
Appendix Table A-4 DDD BPL: Linear Triple Difference (DDD) Estimates Effect of Chiranjeevi Yojana and BPL status on Maternal Outcomes

| | <u>Cohesive</u> | <u>DLHS-III</u> |
|--|-------------------------------|---------------------------|
| Delivered in Facility | -0.78 [-5.99 - 4.42] | 0.5 [-4.33 - 5.33] |
| Private (if Facility) | 2.15 [-4.21 - 8.52] | 5.19 [-2.83 - 13.21] |
| Assisted by Doctor/ Nurse | -1.71 [-6.09 - 2.67] | 2.51 [-2.15 - 7.16] |
| Normal Delivery | -0.98 [-4.05 - 2.09] | -2.21 [-5.15 - 0.72] |
| Complications | -8.32 [-16.95 - 0.31] | -0.2 [-5.73 - 5.34] |
| Became Unconscious | 0.67 [-3.64 - 4.98] | |
| Child needed NICU | 0.49 [-3.07 - 4.05] | |
| Excessive Bleeding | | 0.15 [-2.79 - 3.09] |
| Convulsions | | 0.49 [-1.80 - 2.78] |
| Had ANC Checkup | -11.29*** [-16.19 - -6.40] | 0.43 [-4.11 - 4.97] |
| ANC Checkup by Doctor/Nurse or in Facility | 0.54 [-7.34 - 8.42] | 1.07 [-1.21 - 3.36] |
| Had ANC Testing | | 0.49 [-2.21 - 3.19] |
| Had PNC Checkup | -8.71*** [-16.68 - -0.73] | 3.46 [-1.64 - 8.56] |
| PNC Checkup by Doctor/Nurse | -3.09 [-10.54 - 4.37] | |
| Any Cost | -0.8 [-5.45 - 3.85] | 0.46 [-3.96 - 4.88] |
| Total Cost | -13.69 [-39.98 - 12.60] | 7.9 [-7.31 - 23.11] |
| Non-Hospital Cost | 13.83 [-11.13 - 38.78] | |
| Transportation Cost | | -3.88 [-25.51 - 17.74] |

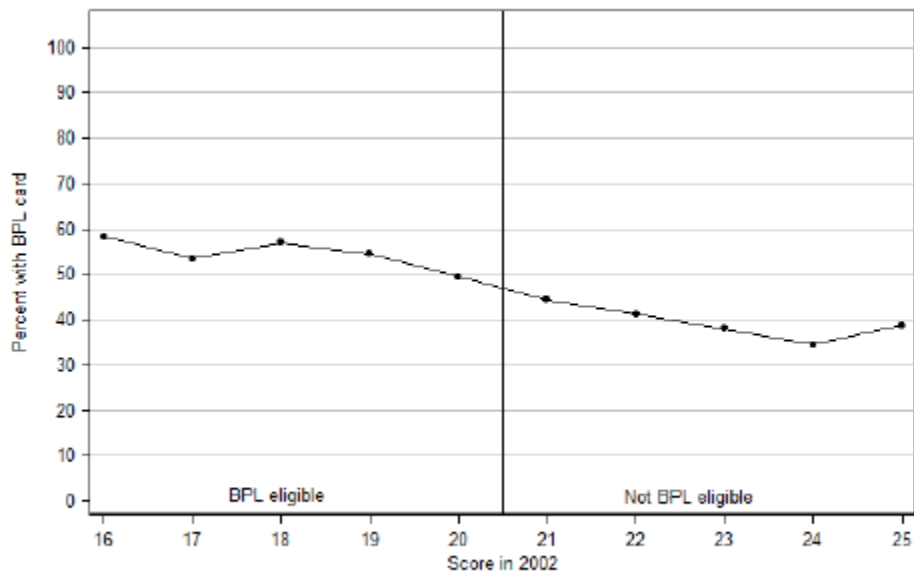
*** p<0.01, ** p<0.05, * p<0.10

DDD coefficients are percentage points for outcomes other than costs; DDD coefficients are percentages for total cost, non-hospital cost and transportation cost. Controls for age at marriage, age at delivery, education, household wealth and religion included by not reported. Year district and caste fixed effects not shown. Sample consists of last child born since 2005. 95% confidence interval in brackets.

Appendix Figure 1: Roll out of Chiranjeevi Program in Gujarat



Appendix Figure 2: BPL Card and BPL Score



Eligibility determined by survey or local authority. BPL score for 2002 constructed from survey data.

Source: COHESIVE Data