Data Article

Maternal and child health care services' utilization data from the fourth round of district level household survey in India

Mohammad Mahbubur Rahman*, Saseendran Pallikadavath

Portsmouth-Brawijaya Centre for Global Health, Population and Policy, University of Portsmouth, UK

A R T I C L E   I N F O

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A B S T R A C T

In this article, we briefly discuss the data used in the article entitled “How Much Do Conditional Cash Transfers Increase the Utilization of Maternal and Child Health Care Services? New Evidence from Janani Suraksha Yojana in India” (Rahman and Pallikadavath, 2018), which has estimated the effects of demand-side financing program named as Janani Suraksha Yojana (JSY) on the utilization of maternal and child health care services in India, using the fourth round of District Level Household Survey (DLHS-4) surveyed on 76,847 Indian women in 2013–14. This survey contains the detailed information on the women's utilization of maternal and child care services, demographic characteristics, and socio-economic status.

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* Corresponding author.
E-mail address: mahbubur72@hotmail.com (M.M. Rahman).

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1. Data

The data is based on the fourth round of district level household survey (DLHS-4), surveyed in 2013–2014, on India’s eighteen high-performing states, Andhra Pradesh, Arunachal Pradesh, Goa, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Punjab, Sikkim, Tamil Nadu, Telangana, Tripura, West Bengal, and three high-performing union territories, such as, the Andaman and Nicobar Islands, Chandigarh, and Puducherry. The previous rounds of that survey collected data from all parts of India. This repeated cross-section survey surveyed on 76,487 women including beneficiaries of Janani Suraksha Yojana (JSY) and other similar schemes, and non-beneficiaries of any scheme. The data used in this study excludes beneficiaries of other schemes.

2. Experimental design, materials, and methods

2.1. Survey design

International Institute for Population Sciences (IIPS), India, conducted the DLHS-4, including the Clinical, Anthropometric and Biochemical (CAB) components for data collection, suggested by Ministry of Health and Family Welfare (MOHFW), Government of India. The survey was planned in 336 districts in the 26 high performing states and Union Territories excluding those covered under the Annual Health Survey. Using the multistage stratified sampling method, the DLHS-4 was planned to include around 1400 households with a population of approximately 7000 per district.

The survey was also designed to undertake some CAB tests so that district-level estimates for nutritional status and prevalence of certain lifestyle disorders can be produced not only among women in reproductive ages and their children below age six but also among all other members of households.
### Table 1
Descriptive statistics of covariates.

| Covariates                                              | JSY Mean | JSY Obs. | NonJSY Mean | NonJSY Obs. | Diff. | p value |
|---------------------------------------------------------|----------|----------|-------------|-------------|-------|---------|
| Household has below poverty line card (1 yes, 0 no)    | 0.469    | 15,841   | 0.318       | 57,220      | 0.151 | <0.0001 |
| Household has scheduled caste affiliation (1 yes, 0 no) | 0.310    | 15,144   | 0.221       | 53,925      | 0.089 | <0.0001 |
| Household has tribal affiliation (1 yes, 0 no)         | 0.177    | 15,837   | 0.176       | 57,159      | 0.002 | 0.596   |
| Current age of woman/mother                            | 23.854   | 15,844   | 25.047      | 57,239      | -1.193| <0.0001 |
| Birth order/parity                                     | 1.842    | 15,788   | 2.163       | 56,796      | -0.320| <0.0001 |
| Wealth Index                                           | -0.654   | 15,838   | -0.016      | 57,204      | -0.639| <0.0001 |
| Highest years of education taken by woman/mother       | 8.675    | 13,665   | 9.563       | 47,616      | -0.888| <0.0001 |
| Religion: Hindu (1 yes, 0 no)                           | 0.698    | 15,842   | 0.653       | 57,223      | 0.045 | <0.0001 |
| Residence: Rural (1 yes, 0 no)                         | 0.683    | 15,844   | 0.593       | 57,239      | 0.090 | <0.0001 |

Note: Birth year dummies and state dummies were also used as covariates, but they are not reported here.

### Table 2
Descriptive statistics of outcome variables.

| Outcome Variables                                              | JSY Mean | JSY Obs. | NonJSY Mean | NonJSY Obs. | Diff. | p value |
|---------------------------------------------------------------|----------|----------|-------------|-------------|-------|---------|
| **Main outcomes**                                             |          |          |             |             |       |         |
| At least one antenatal care (ANC) service (1 yes, 0 no)       | 0.949    | 15,844   | 0.826       | 57,239      | 0.122 | <0.0001 |
| At least one postnatal care (PNC) service for mother (1 yes, 0 no) | 0.747    | 15,844   | 0.632       | 57,234      | 0.115 | <0.0001 |
| At least one PNC service for baby (1 yes, 0 no)              | 0.824    | 15,770   | 0.741       | 56,708      | 0.084 | <0.0001 |
| **ANC services**                                              |          |          |             |             |       |         |
| Weight measured (1 yes, 0 no)                                 | 0.872    | 15,835   | 0.742       | 57,207      | 0.130 | <0.0001 |
| Height measured (1 yes, 0 no)                                 | 0.512    | 15,835   | 0.420       | 57,207      | 0.092 | <0.0001 |
| Blood pressure checked (1 yes, 0 no)                         | 0.806    | 15,835   | 0.671       | 57,207      | 0.136 | <0.0001 |
| Blood tested (haemoglobin) (1 yes, 0 no)                     | 0.717    | 15,835   | 0.613       | 57,207      | 0.104 | <0.0001 |
| Blood tested (blood group) (1 yes, 0 no)                     | 0.648    | 15,835   | 0.544       | 57,207      | 0.105 | <0.0001 |
| Urine tested (1 yes, 0 no)                                   | 0.783    | 15,835   | 0.667       | 57,207      | 0.117 | <0.0001 |
| Abdomen examined (1 yes, 0 no)                               | 0.574    | 15,835   | 0.485       | 57,207      | 0.088 | <0.0001 |
| Breast examined (1 yes, 0 no)                                | 0.352    | 15,835   | 0.311       | 57,207      | 0.041 | <0.0001 |
| Ultrasound done (1 yes, 0 no)                                | 0.634    | 15,835   | 0.581       | 57,207      | 0.053 | <0.0001 |
| Iron Folic Acid tablet/syrup (1 yes, 0 no)                   | 0.795    | 15,844   | 0.633       | 57,207      | 0.162 | <0.0001 |
| At least one tetanus injection (1 yes, 0 no)                 | 0.921    | 15,842   | 0.788       | 57,230      | 0.133 | <0.0001 |
| **PNC services for mother**                                  |          |          |             |             |       |         |
| Abdomen examined (1 yes, 0 no)                               | 0.495    | 15,841   | 0.387       | 57,228      | 0.108 | <0.0001 |
| Advice on breastfeeding (1 yes, 0 no)                        | 0.501    | 15,841   | 0.386       | 57,228      | 0.116 | <0.0001 |
| Advice on baby care (1 yes, 0 no)                            | 0.468    | 15,841   | 0.373       | 57,228      | 0.095 | <0.0001 |
| Advice on Family Planning (1 yes, 0 no)                      | 0.341    | 15,841   | 0.249       | 57,228      | 0.092 | <0.0001 |
| **PNC services for baby**                                    |          |          |             |             |       |         |
| Weight taken at birth (1 yes, 0 no)                          | 0.918    | 15,769   | 0.754       | 56,708      | 0.164 | <0.0001 |
| Days of first breastfeeding                                   | 1.450    | 15,769   | 1.567       | 56,698      | -0.117| <0.0001 |
| Advice on infant diarrhoea (1 yes, 0 no)                     | 0.551    | 15,842   | 0.566       | 57,226      | -0.015| 0.001  |
| Advice on infant pneumonia (1 yes, 0 no)                     | 0.284    | 15,843   | 0.312       | 57,234      | -0.029| <0.0001 |
| **Immunizations for baby**                                   |          |          |             |             |       |         |
| Bacille Calmette Guerin (BCG) (1 yes, 0 no)                   | 0.971    | 7779     | 0.945       | 32,573      | 0.027 | <0.0001 |
| Polio (1 yes, 0 no)                                          | 0.973    | 7782     | 0.956       | 32,571      | 0.017 | <0.0001 |
| First Polio in two weeks of birth (1 yes, 0 no)              | 0.807    | 7782     | 0.738       | 32,574      | 0.069 | <0.0001 |
| Diphtheria, pertussis and tetanus (DPT) (1 yes, 0 no)        | 0.906    | 7782     | 0.860       | 32,570      | 0.046 | <0.0001 |
| Measles (1 yes, 0 no)                                        | 0.865    | 7781     | 0.805       | 32,570      | 0.060 | <0.0001 |
| Hepatitis-B (1 yes, 0 no)                                    | 0.773    | 15,721   | 0.684       | 56,488      | 0.089 | <0.0001 |
| Vitamin-A (1 yes, 0 no)                                     | 0.665    | 15,723   | 0.599       | 56,490      | 0.066 | <0.0001 |
Major CAB components include measuring height & weight, blood pressure, estimation of hemoglobin, and plasma glucose along with testing of salt for iodine component used by all households.

Many questions, which were asked to women, are related to maternal and child health and reproductive health while other adult infectious diseases received very little attention in the survey. There are questions on tobacco and alcohol use, antenatal care, delivery and postnatal care, birth history, family planning immunization, breastfeeding practices and common childhood morbidity symptoms (cough, fever and diarrhoea). The survey also collected information on fertility preferences and menstruation.

2.2. Sample selection

The DLHS-4 collected socioeconomic data by surveying 378,487 households and their members, but it interviewed only 76,847 pregnant women (sample units of this study) to obtain data on the utilization of maternal and child health care (MCHC) services. They fall in the age group of 15–49 years gave their last births in 2008 and onward. The DLHS-4 discarded a woman of a household from asking questions regarding MCHC services’ utilization if she gave her last birth before 2008. All 76,847 pregnant women were supposed to be included in our analysis as the proper implementation of JSY started in 2007. However, there are different numbers of missing observations in different MCHC services’ utilization. For example, only around 42,370 women responded in some MCHC outcomes, and the rest of the women have missing values. We also exclude those women, who received benefits from other schemes, because of their different eligibility criteria and different benefit packages. In this way, we drop 3000 to 3764 women in different MCHC outcomes, but those fallen women change results of treatment effects only after third or fourth decimal points.

2.3. Data measurements and variable definition

We used a set of covariates in the logit regressions, which were used in the propensity score matching (PSM) estimations’ of average treatment effects on the treated. These covariates are a mixture of self-selection criteria and the selection criteria set by the JSY administrators. Table 1 shows them with their sample sizes and means by treatment and control groups, and differences of means and p-values to know their statistical significance. Three dummy variables on poverty status, scheduled caste status, and tribal status are the key selection/eligibility criteria set by the JSY administrators. Those who have below poverty line card and/or scheduled caste affiliation and/or scheduled tribe affiliation are entitled to get JSY benefits. Two continuous variables, the current age of woman and birth order, are also selection criteria established by the program administrators. The rest of the covariates include both continuous, and dummy variables are mostly self-selection criteria. To note that wealth index is constructed by applying principal component analysis over a list of wealth of household — cooking fuel,
Table 3
Effects of JSY on the utilization of individual MCHC services.

|                   | Sample 1                      | Sample 2                      |
|-------------------|-------------------------------|-------------------------------|
|                   | Bootstrap                     | Bootstrap                     |
|                   | ATT S.E. N                    | ATT S.E. N                    |
| **ANC services**  |                               |                               |
| Weight measured   | 0.089*** (0.005) 54,622       | 0.110*** (0.005) 68,491       |
| Height measured   | 0.062*** (0.008) 54,622       | 0.069*** (0.006) 68,491       |
| Blood pressure checked | 0.093*** (0.006) 54,622   | 0.114*** (0.005) 68,491       |
| Blood tested (haemoglobin) | 0.088*** (0.007) 54,622 | 0.108*** (0.006) 68,491       |
| Blood tested (blood group) | 0.088*** (0.006) 54,622 | 0.099*** (0.006) 68,491       |
| Urine tested      | 0.090*** (0.006) 54,622       | 0.107*** (0.005) 68,491       |
| Abdomen examined  | 0.083*** (0.008) 54,622       | 0.091*** (0.008) 68,491       |
| Breast examined   | 0.044*** (0.005) 54,622       | 0.048*** (0.006) 68,491       |
| Ultrasound done   | 0.058*** (0.007) 54,622       | 0.072*** (0.007) 68,491       |
| Iron Folic Acid tablet/syrup | 0.104*** (0.008) 54,659 | 0.125*** (0.006) 68,531       |
| At least one tetanus injection | 0.097*** (0.005) 54,650 | 0.117*** (0.005) 68,521       |
| **PNC services for mother** |                   |                               |
| Abdomen examined  | 0.083*** (0.006) 54,650       | 0.090*** (0.007) 68,517       |
| Advice on breastfeeding | 0.085*** (0.006) 54,650 | 0.089*** (0.007) 68,517       |
| Advice on baby care | 0.078*** (0.005) 54,650 | 0.085*** (0.007) 68,517       |
| Advice on Family Planning | 0.076*** (0.007) 54,650 | 0.081*** (0.006) 68,517       |
| **PNC services for baby** |                   |                               |
| Weight taken at birth | 0.106*** (0.004) 54,586 | 0.136*** (0.004) 68,427       |
| Days of first breastfeeding | -0.088*** (0.012) 54,579 | -0.086*** (0.011) 68,418     |
| Advice on infant diarrhoea | 0.038*** (0.007) 54,648 | 0.041*** (0.007) 68,517       |
| Advice on infant pneumonia | 0.034*** (0.005) 54,654 | 0.034*** (0.005) 68,526       |
| **Immunizations for baby** |                   |                               |
| BCG               | 0.024*** (0.004) 30,366       | 0.026*** (0.003) 38,326       |
| Polio             | 0.020*** (0.004) 30,368       | 0.016*** (0.003) 38,327       |
| First Polio in two weeks of birth | 0.047*** (0.008) 30,371 | 0.060*** (0.007) 38,330       |
| DPT               | 0.037*** (0.007) 30,366       | 0.043*** (0.007) 38,326       |
| Measles           | 0.037*** (0.007) 30,365       | 0.045*** (0.006) 38,325       |
| Hepatitis-B       | 0.076*** (0.006) 54,326       | 0.084*** (0.005) 68,091       |
| Vitamin-A         | 0.072*** (0.007) 54,332       | 0.080*** (0.006) 68,096       |

Note: We impute values of the above outcomes of the counterfactual groups using third nearest neighbors of log-odds ratios estimated from the logit regressions of JSY dummy on covariates under sample 1 and sample 2. We then estimate ATTs for these outcomes applying the simple mean difference formula. Bootstrapped standard errors are in parentheses. * p<0.05, ** p<0.01, *** p<0.001.

Table 2 shows summary statistics of outcome variables (utilization of MCHC services) similarly as we did in Table 1. Except “Days of first breastfeeding”, which is after how many days of birth a mother started breastfeeding her child, all outcomes are dummy variables. We see that all outcomes have statistically significant mean differences between treatment and control groups. They imply that JSY will have significant effects on the utilization of MCHC services. However, we expect a negative effect of JSY on only “Days of first breastfeeding”, but we also see negative mean differences in the cases of “Advice on infant diarrhoea” and “Advice on infant pneumonia.” We have got positive effects for these two outcomes when we estimate average treatment effects on the treated.

2.4. Data description

Table 1 shows the summary statistics of socio-economic variables, and Table 2 shows the summary statistics of maternal and child health care outcomes. Now, Table 3 shows the results of the average treatment effect on the treated (ATT), estimated using the propensity score matching (PSM), for the outcome variables (e.g., the utilization of MCHC services). ATTs are the estimates of the treatment effects on the treated.
effects of JSY on the outcomes. They are estimated for samples 1 and 2. In Table 1, we see that there are some missing values in socio-economic variables as sample sizes are not the same. Mother and her husband’s education have significantly lower samples than others. In sample 2, we drop them when we estimate ATTs, but sample 1 includes all covariates in Table 1. With the increase in sample sizes in sample 2, the control group mainly includes more poor people than the treatment group, and thus the treatment effect estimates, ATTs, increase. We use psmatch2 command in STATA to estimate ATTs. The do file and the dataset are available in Mendeley data.

2.5. Method

As [2–5], and [6] estimated causal effects using the DLHS-3, the DLHS-4 also allows us to employ a multivariate regression model to identify the causal effects of JSY on the utilization of MCHC services. Using STATA, we did analyses of PSM and fuzzy regression discontinuity design.

PSM is a method estimating treatment effects when we assume that treatment is provided based on observed covariates. If the unconfoundedness and overlapping assumptions are satisfied, PSM produces unbiased estimates of treatment effects. However, there can be some unobserved factors, such as political or social connections with JSY administration, which can influence the selection for JSY. In such a situation, PSM gives biased treatment effects. Therefore, we also use fuzzy regression discontinuity design, which is an instrumental variable regression that corrects endogeneity of the treatment dummy, JSY. See our paper [7] for the detailed explanation of these methods.

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References

[1] F. Ram, S.K. Mohanty, U. Ram, Understanding the distribution of BPL cards: all-India and selected states, Econ. Pol. Wkly. (2009) 66–71.
[2] A. Nandi, R. Laxminarayan, The unintended effects of cash transfers on fertility: evidence from the safe motherhood scheme in India, J. Popul. Econ. 29 (2) (2016) 457–491.
[3] T. Powell-Jackson, S. Mazumdar, A. Mills, Financial incentives in health: new evidence from India’s Janani Suraksha Yojana, J. Health Econ. 43 (2015) 154–169.
[4] S.S. Lim, L. Dandona, J.A. Hoisington, S.L. James, M.C. Hogan, E. Gakidou, India’s Janani Suraksha Yojana, a conditional cash transfer programme to increase births in health facilities: an impact evaluation, Lancet 375 (9730) (2010) 2009–2023.
[5] N. Carvalho, N. Thacker, S.S. Gupta, J.A. Salomon, More evidence on the impact of India’s conditional cash transfer program, Janani Suraksha Yojana: quasi-experimental evaluation of the effects on childhood immunization and other reproductive and child health outcomes, PLoS One 9 (10) (2014) e109311.
[6] N. Sengupta, A. Sinha, Is India’s safe motherhood scheme leading to better child health care practices? Global Soc. Welf. 5 (1) (2018) 49–58.
[7] M.M. Rahman, S. Pallikadavath, How much do conditional cash transfers increase the utilization of maternal and child health care services? New evidence from Janani Suraksha Yojana in India, Econ. Hum. Biol. 31 (2018) 164–183.