

Estimating Leakages in India's Employment Guarantee Using Household Survey Data

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Introduction

We compare the administrative data on the implementation of the Mahatma Gandhi National Rural Employment Guarantee Act (MG-NREGA) with the estimates of public works employment from a large-scale survey undertaken by India's National Sample Survey Office. A widely held concern is that the administrative employment records are inflated by corrupt officials and therefore do not reflect the true employment provided. By comparing the administrative data with independent survey data, we provide an estimate of the fraction of officially reported days that are actually worked.

The employment estimates from the survey data are between 42% and 56% of the employment reported in the administrative data. These numbers are similar in magnitude though generally lower than existing estimates. In particular, using a similar approach, Himanshu (2010) estimates that 70% of the reported days are independently confirmed by the NSSO data. Bhalla (2010) estimates the number to be 50% using an earlier time period.

We describe below how estimates based on similar data can lead to such different results and emphasize the tentative nature of estimates based on the NSSO data. In particular, our estimates are based on 2007-08 since that is the period for the most recent available NSSO survey. Much has changed since 2008, and the figures reported are likely only a rough approximation of the current extent of over-reporting. For example, as Khera writes in another chapter of this volume, the introduction of wage payments through banks likely works to reduce the extent of over-reporting.

Data

Our data come from two sources. The administrative data are taken from the Monthly Progress Reports (MPRs) available for each district on the NREGA website.¹ This data reflects the person-days that are reported by each state to the central government for disbursement of funds. These numbers should capture any inflation of person-days due to corruption.² Our analysis uses the MPR data from July 2007 to June 2008.

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¹ The official NREGA website address is <http://nrega.nic.in>.

² In contrast, the data from the more recent Management Information System (MIS) is entered directly from muster rolls, often at the panchayat or block level. The MIS was not in use during the time period for which NSSO survey data is available.

We compare the administrative data to survey data collected by the NSSO. The NSSO conducts an India-wide employment survey, which collects detailed information about activities performed by all persons in each surveyed household during the last seven days. In particular, the NSSO records how many days each person worked in public works. Most of the analysis will use the 64th round of the employment survey, which was conducted from July 2007 through June 2008. We will also use the 61st round, which was conducted from July 2004 to June 2005 for one of our estimates.

The NSS survey methodology minimizes the risk of recall bias, since respondents are asked about their activities in the last seven days. Under reporting is also minimized, because for each day at least one activity must be recorded, and respondents are allowed to report up to two activities on a given day.

A full discussion of the NSSO's survey methodology is provided in the NSSO Survey Reports.³ The NSSO surveys a random sample of households stratified at the district, sector, sub-round level, where sector is either rural or urban and sub-round is a period of three months. Using the survey weights as described in NSSO (2007), we are able to construct estimates of the number of person-days worked in public works in rural areas.

We restrict the state-level analysis to the twenty largest states by population. Together, these states account for 98.5% of India's rural population. The total sample size for the 64th round is 262,396 adults aged fourteen years or older from 79,045 households. Although this is a relatively large sample by survey standards, it is still small enough that sampling error is a concern especially for the state-level results presented later.

Methodology

Our analysis covers the period July 2007 to June 2008, since it is the only year for which we have both NSSO and MPR data. We use the NSSO survey data to construct estimates of person-days worked in public works:

$$NSS = n_p^m \hat{X}_m + n_p^f \hat{X}_f$$

where n_p^m is the number of rural males based on census projections, n_p^f is the number of rural females based on census projections, and \hat{X}_m and \hat{X}_f are the per capita estimates of public works using the NSSO survey data for males and females surveyed in rural India.

We present two primary estimates using the NSSO data which differ only in how we estimate the per capita days worked in public works \hat{X}_m and \hat{X}_f .⁴

Our first estimate is based on whether the person reports working in any type of public works. This estimate is a natural upper bound for total NREGA employment as it

³ See for example NSSO (2007).

⁴ All per capita estimates are constructed using survey sampling weights as described in NSSO 2007.

includes non-NREGA public works. Our second estimate is obtained by computing the increase in public works from the 2004-05 period prior to the NREGA to 2007-08. This estimate assumes that non-NREGA public works did not change between 2004-05 and 2007-08. We take this estimate as a lower bound for total NREGA employment since the NREGA likely crowds out existing public works.

The 2007-08 NSSO employment survey introduces a specific category of public works labeled NREGA public works. We also present estimates based only on persons who report work in NREGA public works. This estimate will be biased downwards if some people who were provided work under the NREGA mis-report their activity as generic non-NREGA public works. Mis-reporting is a serious concern since during 2007-08, the NREGA had been active for less than a year in most districts of India. Confirming these concerns, the estimates based on NREGA public works are significantly lower than the estimates computed using the change in public works from 2004-05 to 2007-08.

We compare the estimates based on the NSSO survey data with the person-days reported in the NREGA administrative monthly progress reports divided by the number of rural households as used above. In comparing the results, we compute both the ratio of the NSS to MPR estimates as well as the MPR estimates less the NSS estimates divided by the estimated number of rural households based on census projections. The ratio provides an estimate of the fraction of official days of work that are independently reported as being worked by survey respondents. This number gauges the proportional leakage for each state. However, we are also interested in the absolute amount of over-reporting. For example, we may be more concerned about a state that reports ten days of work per rural household but only provides five compared with a state that reports two days per household and provides only one. For this reason, we also present the simple difference between the MPR and NSS estimates. These differences estimate the amount of over-reporting per rural household.

Results

The last row of Table 1 shows the two estimates of person-days generated from the survey data as well as the administrative data at the national level. From July 2007 to June 2008, the government disbursed funds for 1.84 billion person-days⁵. Based on the estimates from the NSSO survey, respondents reported working 1.02 billion person-days (56% of the official figure) in public works (NREGA and non-NREGA). If we compare the 2007-2008 to the 2004-2005 survey, the increase in person-days spent in public works is 777 million (42% of the official figure).

We further disaggregate our results by state, as shown in Table 1. There is significant variation across states in terms of person-days generated by the NREGA. The state-level

⁵ Our estimates are not directly comparable to the figures reported in chapter two since we use the period from July 2007 through June 2008 rather than April 2007 through March 2008 and since we also include phase three districts in which the NREGA was started in April 2008.

variation corresponds well with the on-the-ground evidence presented in other chapters of this book. In particular, a large fraction of the employment reported in the administrative data for Andhra Pradesh, Himachal Pradesh, Tamil Nadu and Rajasthan is confirmed by the NSSO survey estimates. Using the first estimate of NSS employment, the survey estimates are 76% to 102% of the administrative employment numbers.

Andhra Pradesh, MP, Rajasthan, and Chhatisgarh lead in terms of employment generated per household using both the MPR and NSSO figures. Not only do these states provide more work, but according to the higher bound estimate, between 55% and 99% of the officially reported work shows up in the NSSO survey data, which is higher than the national average. Still, the absolute amount of over-reporting in MP, with 12 to 16 days over-reported per rural household, Chhatisgarh with 19 to 26 days and to a lesser extent Rajasthan, with 5 to 19 days, is substantial. The large difference between the higher and the lower bound estimates for employment in Rajasthan is likely due to the discontinuation of non-NREGA relief works between 2004-05 and 2007-08.

On the other hand, some states exhibit large numbers in the official data with very little employment reported in the survey data. Jharkhand and to a lesser extent Bihar have substantial employment based on the MPR data but relatively little employment reported in the survey data. Our results reveal below average performance in Orissa, Uttaranchal and Uttar Pradesh as well. Finally, some states have seen a fall in public works employment between 2004-2005 and 2007-2008, yielding a negative estimate for NSS2. The fall is sharpest in Maharashtra, which had its own employment guarantee program prior to the NREGA.

In closing, we emphasize that the employment numbers constructed using NSSO survey responses are only estimates of the true person-days work. The true employment generated will be different due not only to possible under-reporting but also due to sampling error. This is especially relevant for the state-level estimates. For example, the estimate of zero days for Gujarat does not imply that no public works were provided.

Alternative Estimates

We are not the first to provide estimates of the degree of employment inflation in the NREGA administrative data. Table 2 presents some of the alternative estimates using the NSSO and NREGA administrative data alongside the results presented here. We briefly discuss these studies below.

One could compare the NSSO survey data from July 2007 to June 2008 with the administrative data for the NREGA fiscal year from April 2007 to March 2008. This method is followed by Himanshu (2010). The drawback of this approach is that the NSSO and administrative years do not correspond to the same time period. Since employment provided by the NREGA has increased each year, a comparison of the NSSO survey year with the administrative year will yield a higher estimate of days worked per day reported in the administrative data.

Bhalla (2010) compares the July 2006 to June 2007 NSSO survey data with the April 2006 to March 2007 administrative data and finds that the survey estimates are 51% of the administrative numbers. The key difference between this estimate and the others is that the 2006-07 NSSO survey asked about work performed in the past 365 days rather than the past 7 days. If respondents are unable to recall all person-days worked in the past year, this estimate is likely to be biased downwards. However, for the same reasons outlined above, the estimate may be biased upwards.

Finally, the last row of Table 2 presents estimates using public works explicitly categorized as NREGA by respondents. The estimate of 34% is substantially below even the lower bound estimate based on the change in public works.

Bhalla (2010) further estimates leakages for total employment expenditures, including both over-reported person-days and inflated wages. Using data from a survey conducted in Orissa, Niehaus and Sukhtankar (2009) show that both types of corruption exist. We do not use the NSS data to assess inflation of wages, because at the time of the survey, it is likely that workers have not yet received payment for work performed during the past seven days.

Final Remarks

Our estimates suggest that roughly half of the person-days reported by the government are independently confirmed by survey responses. While the leakages in 2007-8 are high, the aggregate estimates mask considerable heterogeneity across states. The results support the evidence presented throughout this volume that corruption is much less of a concern in the four high-performing states of Tamil Nadu, Himachal Pradesh, Rajasthan, and Andhra Pradesh.

As discussed above, these estimates likely provide only a rough guide to the current extent of over-reporting. The upcoming release of the 2009-10 NSS data, as well as the possibility of a nationally representative survey focused solely on the NREGA are both reasons to be hopeful that we will soon have more reliable estimates of employment generated by the NREGA.

References

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Table 1: Survey Estimates for July 2007 to June 2008 and Administrative Employment per Rural Household for August 2007 to June 2008

State	NSS1	NSS2	MPR	(MPR - NSS1)/ HH	(MPR - NSS2)/ HH	NSS1/MPR	NSS2/MPR
Andhra Pradesh	290,464,268	284,131,135	291,935,000	0.11	0.57	0.99	0.97
Assam	8,121,708	7,904,764	57,192,000	10.74	10.79	0.14	0.14
Bihar	35,940,273	29,918,327	116,419,000	5.75	6.18	0.31	0.26
Chhattisgarh	81,070,298	56,966,488	148,591,001	18.96	25.72	0.55	0.38
Gujarat	0	-4,346,844	8,584,000	1.34	2.01	-	-
Haryana	6,397,936	6,397,936	4,273,000	-0.77	-0.77	1.50	1.50
Himachal Pradesh	12,159,935	7,520,130	11,798,000	-0.31	3.69	1.03	0.64
Jammu & Kashmir	1,563,504	-16,559,034	3,590,500	1.59	15.85	0.44	-
Jharkhand	12,693,080	10,101,779	87,074,000	17.94	18.57	0.15	0.12
Karnataka	39,437	-1,099,974	22,554,000	3.18	3.34	0.00	-
Kerala	4,622,487	3,780,207	6,699,000	0.39	0.55	0.69	0.56
Madhya Pradesh	209,425,542	188,962,467	326,343,999	12.99	15.26	0.64	0.58
Maharashtra	4,614,372	-14,176,488	27,254,000	1.91	3.49	0.17	-
Orissa	24,427,873	13,476,005	44,080,000	2.80	4.35	0.55	0.31
Punjab	2,145,844	2,145,844	2,144,000	0.00	0.00	1.00	1.00
Rajasthan	136,562,872	28,971,840	180,468,000	5.48	18.89	0.76	0.16
Tamil Nadu	64,255,929	64,255,929	63,061,000	-0.14	-0.14	1.02	1.02
Uttar Pradesh	63,246,208	56,384,342	136,967,000	3.19	3.49	0.46	0.41
Uttaranchal	10,698,427	9,544,703	41,155,000	23.52	24.41	0.26	0.23
West Bengal	37,701,374	29,761,131	102,207,999	5.30	5.95	0.37	0.29
All India	1,023,032,696	776,892,063	1,840,875,000	5.45	7.09	0.56	0.42

Notes

- (1) Estimates are from round 64 and 61 of the NSS Employment and Unemployment Survey
All estimates are adjusted using survey sampling weights
- (2) The All India estimates are greater than the sum of the state estimates since they include all states in India while state-level estimates are computed only for the largest 20
- (3) NSS1 is an estimate of the total number of person-days worked in any type of public works based on NSS surveys.
- (4) NSS2 is an estimate of the change in the total number of person-days worked in any type of public works between 2004-2005 and 2007-2008.
- (5) MPR is the total number of person-days worked according to the NREGA administrative data.
- (6) (MPR-NSS)/HH denote the difference between MPR figures and NSS estimates expressed per rural household in 2007. See the text for more details.

Table 2: Estimates of the share of person-days reported in administrative data confirmed by household surveys

Article	Administrative source	Survey source	Survey question	Estimate
Himanshu 2010	MPR for the financial year 2007-2008	NSS survey 64th Round (July 2007 to June 2008)	Person-days in public works in the last 7 days	70%
Bhalla 2010	MPR for the financial year 2006-2007	NSS survey 63rd Round (July 2006 to June 2007)	Person-days in public works in the last 12 months	51%
Present paper: upper bound	MPR for the months of July to June 2008	NSS survey 64th Round (July 2007 to June 2008)	Person-days in public works in the last 7 days	56%
Present paper: lower bound	MPR for the months of July to June 2008	NSS survey 64th (2007-2008) and 61st (2004-2005) Rounds	Person-days in public works in the last 7 days	42%
Present paper: alternative estimate	MPR for the months of July to June 2008	NSS survey 64th Round (July 2007 to June 2008)	Person-days in NREGA works in the last 7 days	34%