

# Improving the Measurement of Women's Work Sensitivity of Work Participation Rates to Survey Design

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## Overview and Measurement Challenge

Indian labour force surveys record a tremendous decline in rural women's work participation rates—from 51 per cent to 25 per cent between 2004-05 and 2017-18. However, when survey questions are worded somewhat differently, the decline is far smaller (Desai and Joshi, 2019). How sensitive are the estimates of work participation to survey design? What is the role of entrenched gender norms in shaping the response to survey questions?

Prior research has noted that what is identified as work varies by gender. Activities performed by men are often called "work" by respondents; the same activities, when performed by women, are often seen as an extension of household chores. Hence, unless enumerators are specifically trained to ask probing questions, women's work may well be under-estimated. The changing data collection climate in India, with increased reliance on new and relatively untrained contract investigators, may result in increasing under-estimation of women's work over time.

Can this challenge be overcome by designing survey questions that do not rely on interviewer probing and are less sensitive to interviewer training? In order to test the impact of survey wording on the measurement of work participation for men and women, researchers at the NCAER National Data Innovation Centre (NDIC), Neerad Deshmukh, Sonalde Desai, and others conducted an experiment in which the same individuals were first asked to report their employment status using the primary and

subsidiary status questions for the preceding year in a fashion analogous to that adopted by the National Sample Surveys. In a subsequent part of the survey, respondents were asked to report on participation in several enumerated activities.

## Key Results

**Labour force status questions identify fewer women as working than questions that ask about participation in specific activities.** When respondents were asked to identify primary and secondary activities of women, they listed women as being homemakers. When they were asked about who participated in wage work, non-wage subsistence work or family business, the same women were more likely to be included as workers.

**This difference is particularly large for work on family farms and in caring for livestock.** About 96 per cent of the omitted activities are concentrated in work on family farm and caring for the livestock.

**Under-estimation of work participation is limited to women and does not affect estimates of men's work.** Changes in question wording increase women's work participation rates but tend to depress men's work participation rates slightly. This suggests that normative responses to labour force participation questions work in men's favour and against women.





## Methodology

Labour force surveys such as the Indian National Sample Surveys (NSS) ask about usual principal activity status over a majority of the preceding 365 days in which individuals are first categorised as those in the labour force and those not in the labour force, and then the details of activities are collected. In addition to the major time criterion, individuals who were pursuing economic activities for a period of at least 30 days are classified as being in the labour force according to usual subsidiary activity status.

In contrast to this approach, which we define as “status listing”, it is also possible to ask households about individuals who engage in a predefined and exhaustive set of activities and the time they spend in each activity. Based on these answers, analysts can classify various individuals as being employed or not employed. This approach, defined as “activity listing”, may inspire respondents to think differently.

We examine the role of these potential sources of bias using an experimental design in a survey conducted in 2018-19. As part of the Delhi Metropolitan Area Study (DMAS), 5,252 households were fielded a questionnaire including both the approaches mentioned

below. Information was collected on 27,428 individuals residing in 12 of the 31 districts in the Delhi National Capital Region (NCR) across the 4 states, covering both urban and rural areas.

At the start of the interview, the respondents were asked:

- What was the primary activity status of different household members over the past 12 months?
- What is the secondary activity that they undertook which lasted for at least 30 days?

These questions are identical to the questions included in the NSS. However, they were followed up by questions that led the respondent through different sources from which the household derived its income and after each source of income, respondents were asked which household members participated in this activity and how much time they committed to it.

These activity-based questions capture data pertaining to the following questions:

- Who are the household members that worked on family farm?



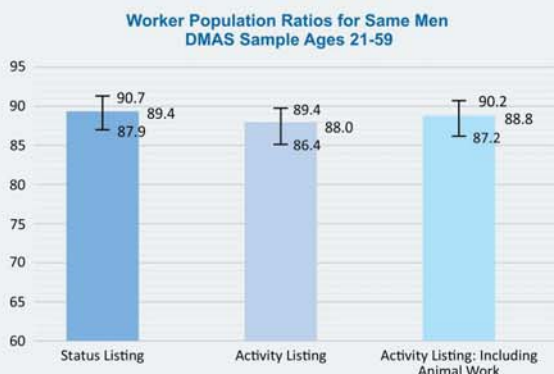
- Who are the household members that took care of livestock?
- Who are the household members that participated in family business?
- Who are the household members that participated in farm or non-farm wage work?

The difference between status-based questions included in the labour force surveys and activity-based questions included in the experimental approach lies in ensuring that the interpretation of what counts as “work” is not left to individuals but is rather explicitly defined.

### How Comparable are DMAS Work Participation Rates to Other Data Sources?

DMAS Work Participation Rates based on status listing appear to be slightly higher than those recorded by the Periodic Labour Force Survey (PLFS) for urban Delhi, the only region that is easily comparable. For men, the difference is about 4 percentage points (71 per cent in PLFS vs. 75 per cent in DMAS) and for women, it is about 9 percentage points (14 per cent in PLFS vs. 23 per cent in DMAS). While these differences are not large, they may reflect a difference in sampling design or may be attributed to the extensive training given to DMAS interviewers.

Figure - 1



Note: The upper and lower bounds represent the 95% confidence interval. Source: Authors’ calculations using data from the Delhi Metropolitan Area Study.

Figure - 2



Note: The upper and lower bounds represent the 95% confidence interval. Source: Authors’ calculations using data from the Delhi Metropolitan Area Study.

## Results

Labour force status questions identify fewer women as working than questions that ask about participation in specific activities.

The difference in the proportion of women identified as working varies drastically depending upon the question wording. Among the DMAS sample of 21-59 year-olds, only 28 per cent of the women are identified as working using either the usual principal or subsidiary status questions. However, when respondents are asked about participation in farming, non-farm business, and wage work, the proportion increases to about 33 per cent. When questions about individuals caring for livestock are added, the proportion increases to 44 per cent. This suggests that respondents do not see women as being in the labour force when asked about their employment status but when asked about specific activities, they are more likely to report women’s participation in these activities.

**This difference is particularly large for work on family farms and in caring for livestock, and consequently affects rural estimates more than urban estimates.**

Much of the overlooked work consists of women’s work on family farms and caring for livestock. This suggests that omission of women’s work is a problem particularly affecting rural areas. In the DMAS urban sample, the difference between activity and





status listing is barely 2 percentage points for urban areas but as much as 34 percentage points for rural areas. For rural women, farm work and caring for livestock merges into their day-to-day household activities and informants often do not consider it as “work”. It is only when explicit questions are asked about participation in these activities that we are able to get estimates of women’s contributions to these sectors.

**Under-estimation of work participation is limited to women and does not affect estimates of men’s work.**

A substantial body of literature on gender and development (Banerjee and Jain 1985) notes that gender norms dictate that male farmers are called farmers whereas women farmers are often dubbed as family helpers. Our results from DMAS support this. Most of the increase in employment using activity listing takes place for women. Among the DMAS sample of urban and rural respondents, when precise questions about participation in specific activities were asked, the worker to population ratio for women increased by 16 percentage points, and the increase for rural women was far larger than that for urban women. However, the WPR for men declined slightly by 0.5 percentage points. Thus, where men are assumed to be working by default, women are assumed to be

out of the labour force until specific questions force respondents to revise their answers.

**Figure - 3**

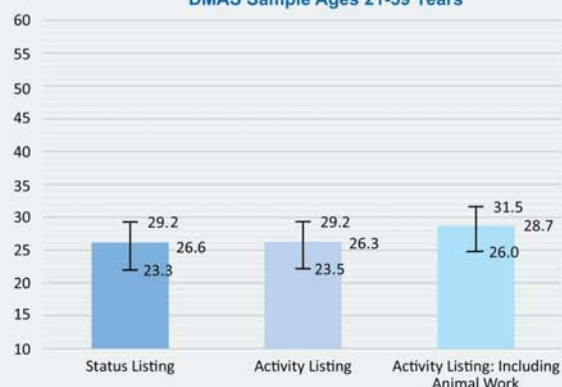
**Worker Population Ratios for Rural Women  
DMAS Sample Ages 21-59 Years**



Note: The upper and lower bounds represent the 95% confidence interval.  
Source: Authors’ calculations using data from the Delhi Metropolitan Area Study.

**Figure - 4**

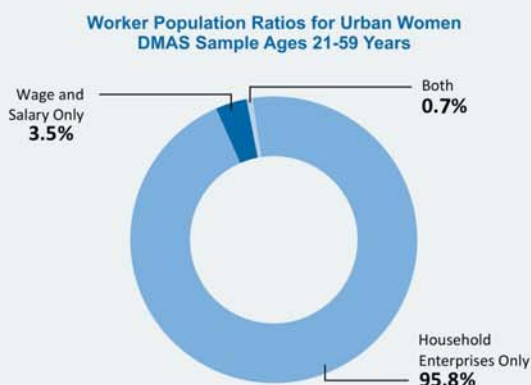
**Worker Population Ratios for Urban Women  
DMAS Sample Ages 21-59 Years**



Note: The upper and lower bounds represent the 95% confidence interval.  
Source: Authors’ calculations using data from the Delhi Metropolitan Area Study.



Figure - 5



Source: Authors' calculations using data from the Delhi Metropolitan Area Study.

## Research Design Lessons

The under-enumeration of women's work is well recognised. However, the research community tends to advocate time use surveys in order to address this under-enumeration. Time use surveys are often expensive and difficult to carry out, particularly in low-literacy and rural settings where people may not keep track of time with the same level of precision as in urban settings.

The NCAER NDIC experiment reported here suggests that a hybrid approach in which individuals are asked to identify their participation in activities most commonly undertaken in study settings may allow for greater capture of activities omitted by traditional labour force surveys.

These results also suggest the need for caution in interpretation of statistics on the decline in women's work participation recorded by NSS and PLFS. While the questions themselves have not changed over time in these surveys, there has been an enormous change in the way in which the surveys have been conducted and the nature of investigators recruited for the surveys. With increased reliance on contract investigators instead of regular staff, it is possible that the investigators do not fully understand what is meant by labour force participation and may carry their gender biases into the field. Thus, some of the recorded decline in women's work participation in rural

areas may be due to increased interviewer error. By clearly identifying the activities for which data is to be collected, the module incorporated in DMAS reduces the potential for interviewer error and bias.

### Future Research Needs

Future research should focus on the cognitive interviewing of investigators and evaluation of audio-recorded interviews to better understand the way in which data on principal and subsidiary activity status is collected. It may be useful to understand the extent to which interviewers carry their gender bias with them in what they define as work. Disaggregating this data by the gender of the interviewer and the gender of the respondent may also help us understand the role of implicit bias in labour force data for women.





### DMAS Study Design and Survey Methodology

In a dynamic research and policy environment with a growing demand for data, it is crucial to invest in methods of data collection leading to rapid, high-quality and policy-relevant data. Changing socio-economic conditions and technological innovations necessitate rethinking of the kind of data that are collected and how they are collected, and also of the ways in which they are collated and made accessible to users. In this context, the NCAER National Data Innovation Centre (NDIC) is visualised as a centre of innovation and excellence in data collection with the objective of strengthening the data ecosystem in India. The Delhi Metropolitan Area Study (DMAS), a flagship study of NDIC, serves as an incubator to experiment with innovations in data collection on various domains, including household income and expenditure, labour force participation, financial inclusion, health insurance and healthcare expenditure, gender equality and empowerment, among others. The two key objectives of DMAS are: 1) Conducting methodological experiments in data collection involving technological innovations and innovations in questionnaire designing; and 2) Demonstrating the concept of remote monitoring of data collection activities to improve data quality.

The target geographical area for DMAS is the National Capital Region (NCR) of India. According to the NCR Planning Board Report (2016-17), Delhi NCR comprises 31 districts spread over four States. Within a State, the DMAS sample is drawn using a multi-stage stratified cluster sampling design, with the district or First Stage Unit (FSU), cluster or Second Stage Unit (SSU), and household or Ultimate Stage Unit (USU) being selected at subsequent stages. The SSU is defined as a village in rural areas and as an Urban Frame Survey (UFS) block in urban areas. The goal is to select a representative random sample at each stage of selection.

The total sample size for the DMAS baseline survey is 5,420 households. The number of households to be surveyed from each SSU (village/UFS block) was assumed to be 20. An equal number of households were considered from each SSU in order to manage the interviewer workload efficiently. Within a district, SSUs were allocated to urban (UFS blocks) and rural areas (villages) in proportion to the percentage of urban and rural households in the district.





**Table 1: Distribution of the DMAS Sample across Districts**

State	District Name	% Urban Households	UFS blocks	Villages	Total Clusters	Households
Haryana	Sonipat	32.5	7	15	22	440
Haryana	Jind	23.6	5	17	22	440
Haryana	Rohtak	43.3	10	12	22	440
Haryana	Palwal	24.2	5	17	22	440
Delhi	North-west Delhi	94.5	22	0	22	440
Delhi	East Delhi	99.8	22	0	22	440
Delhi	South Delhi	99.6	22	0	22	440
Rajasthan	Alwar	20.0	5	18	23	460
Rajasthan	Bharatpur	20.4	4	18	22	460
Uttar Pradesh	Muzaffarnagar	29.7	7	17	24	480
Uttar Pradesh	Meerut	53.1	12	11	23	460
Uttar Pradesh	Ghaziabad	70.8	17	7	24	480
<b>Total</b>		<b>56.2</b>	<b>138</b>	<b>132</b>	<b>270</b>	<b>5420</b>

### Further Reading:

Banerjee, N., & Jain, D., (1985). *Tyranny of the Household : Investigative Essays on Women's Work*. New Delhi: Shakti Books.

Benes, E., & Walsh, K. (2018). "Measuring Employment in Labour Force Surveys: Main Findings from the ILO LFS Pilot Studies". Geneva: ILO. Retrieved from [https://www.ilo.org/global/statistics-and-databases/publications/WCMS\\_635732/lang--en/index.htm](https://www.ilo.org/global/statistics-and-databases/publications/WCMS_635732/lang--en/index.htm), Accessed on January 13, 2020.

Desai, S., & Joshi, O. (2019). "The Paradox of Declining Female Work Participation in an

Era of Economic Growth." *The Indian Journal of Labour Economics*, 62(1): 55–71, <https://doi.org/10.1007/s41027-019-00162-z>, Accessed on January 13, 2020.

Hirway, I. (2012). "Missing Labour Force: An Explanation." *Economic and Political Weekly* 47(37).

Klasen, S., & Pieters, J. (2013). "What Explains the Stagnation of Female Labor Force Participation in Urban India?" *IZA Discussion Paper No 7597*. Bonn: IZA. Retrieved from <http://ftp.iza.org/dp7597.pdf>, Accessed on January 13, 2020.

Mehrotra, S., & Parida, J. K. (2017). "Why is the Labour Force Participation of Women Declining in India?" *World Development*, 98, 360-380. doi: <https://doi.org/10.1016/j.worlddev.2017.05.003>, Accessed on January 13, 2020.

NSSO (2019): Periodic Labour Force Survey, Annual Report, 2017-18. New Delhi: National Sample Survey Organisation, Ministry of Statistics and Programme Implementation, Government of India. Retrieved from [http://www.mospi.gov.in/sites/default/files/publication\\_reports/Annual%20Report%2C%20PLFS%202017-18\\_31052019.pdf](http://www.mospi.gov.in/sites/default/files/publication_reports/Annual%20Report%2C%20PLFS%202017-18_31052019.pdf), Accessed on January 13, 2020.

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**About NCAER NDIC:** The NCAER National Data Innovation Centre was set up in December 2017 to promote innovation and excellence in data collection and build research capacity to strengthen the data ecosystem in India. The NDIC is envisaged as a hub for providing expertise to policymakers, government statistical agencies and private data collection agencies. NDIC is pursuing three primary goals: (1) To pilot innovative data collection methods and mainstream successful pilots into larger data collection efforts; (2) To impart formal and informal training to a new generation of data scientists; and (3) To serve as a resource for data stakeholders, including Government data agencies and ministries. NDIC is experimenting with survey instruments and modes of data collection to address shortcomings in existing approaches. Other capacity building activities that enable NDIC to serve as a key partner in India's evolving data infrastructure include regular workshops and lectures addressing critical issues related to statistical data collection, and an annual data collectors' conference, with the next one scheduled for June 2020 (subject to change due to the Coronavirus epidemic).

**About NCAER:** Established in 1956, NCAER is India's oldest and largest independent, non-profit, economic policy research institute. NCAER's work cuts across many sectors, including growth, macro, trade, infrastructure, logistics, labour, urban, agriculture and rural development, human development, poverty, and consumers. The focus of NCAER's work is on generating and analysing empirical evidence to support and inform policy choices. It is also one of a handful of think tanks globally that combine rigorous analysis and policy outreach with deep data collection capabilities, especially for household surveys. More on NCAER is available on [HYPERLINK "http://www.ncaer.org"](http://www.ncaer.org) [www.ncaer.org](http://www.ncaer.org).



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